4 The Agent Stories System

Some people think that we're made of flesh and blood and bone. Scientists say we're made of atoms. But I think we're made of stories! When we die, that's what people remember, the stories of our lives and the stories that we told.

- Ruth Stotter, from The Storyteller's Calendar. December 1992

A writer is not so much someone who has something to say as he is someone who has found a process that will bring about new things he would not have thought of if he had not started to say them.

- William Stafford, from Writing the Australian Crawl, February 1982

4.1 Overview

The software tool designed as a part of this metalinear narrative research is called Agent Stories. Agent Stories is a story design and presentation environment for metalinear, multiple point of view (POV) cinematic stories. Agent Stories is designed to be placed in the hands of the metalinear story writer for use as a tool to promote the structuring and rewriting of metalinear narratives, before they are realized in audio and video. Agent Stories is also able to store and present stories in a cinematic form using digital video and audio.

Agent Stories has five key parts or environments, each one shown as a different screen in the software:

1) The Structural Environment, in which the structure of the narrative is described using abstract building blocks.
2) The Representational Environment, in which knowledge of the various story elements is captured in the form of relationships between story granules or clips.
3) The Writer Feedback Environment, in which the writer is given feedback from the Agent Stories tool on the constructability of the collection of story clips. This is done through the implementation of software agents called story agents, which make clip sequencing decisions.
4) The Presentational Environment, in which the story agents work as video editors, intelligently sequencing and orchestrating the different story elements according to a particular agent's individual stylistic preferences. The audience chooses which story agent to activate, thereby also choosing the type of story they will receive.
5) The Agent Scripting Environment, which offers the writer an easy way of directing the narrative construction, by designing new story agents

Each environment screen offers the writer powerful tools for thinking about and designing stories that can be told through multiple characters. While Agent Stories was designed specifically for constructing fictional multiple POV metalinear stories, non-fictional stories can also be designed using the tool.

4.1.1 Navigation

At the bottom of each environment screen in Agent Stories is a multi-function tool palette. The tool palette allows the user to navigate from one environment to another by hitting the appropriate tab. The user is reminded which environment they are currently viewing by the active tab shading gray. By hitting the tab of the current environment name, the tool palette will rise to reveal buttons and other objects which the writer will need for that particular environment. Hitting the current environment tab again will lower the tool palette.

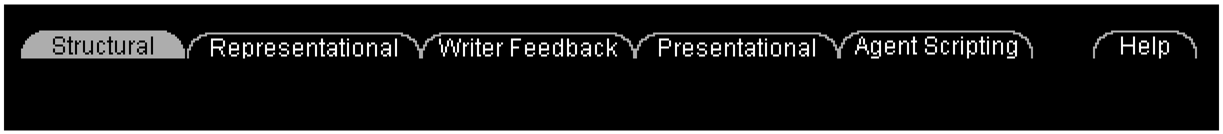


Fig. 19 The navigational palette for moving between the different environment screens. The gray tab indicates the current environment.

4.1.2 Story Structure

The Structural Environment of Agent Stories allows a story designer to create a simple structure or framework for a metalinear story and then use that framework to create multiple narratives from a single collection of story elements. The framework is composed of seven narrative primitives which the writer uses to build an abstract description of a linear story structure. The framework becomes an abstract expression of the linear stories to be constructed later. During operation, the framework also becomes the metric which the system uses to tell how well it has constructed narratives.

4.1.3 Story Connections

The goal of the Representational Environment of Agent Stories is to express, in a useful and efficient way, intelligent reasoning about the elements in a story domain. In the representational environment, a clip is defined as a story element with its message conveyed from a single POV and with a single or limited number of narrative meanings. The writer uses this environment to create a story granule or clip object by typing or pasting text into a graphic window, then drawing links from the clip to other clips. Each clip is linked to at least one other. There are six types of links for this purpose, which are used to broaden or deepen the definition of each clip. Collectively, the story clips form an interconnected web, the nature of which shapes the personality and potential of the linear stories to be constructed.

4.1.4 The Interactive Process

As this research seeks to deliver a process for creating metalinear narrative, one of the goals of Agent Stories to provide the writer with a means for clearly understanding the state of the story and its descriptive structures of representation by feeding back sketchy linear stories. A sketchy story is the simplest textual linear story construction possible, given a specified story structure and a method or style of reasoning about the construction. Once there is a framework and a web of story clips created in the previous two environments, the writer can have a sketchy story presented back to her within the Writer Feedback Environment (WFE). The Agent Stories WFE is where story agents designed with goals of narrative construction, combine the story framework of the Structural Environment with the story representation of the Representational Environment. Different story agents construct narratives in different ways, according to their own particular style. The writer employs the different agents in constructing and presenting her version of a linear story using the metalinear storybase and story structure. By constructing a linear story and providing a textual explanation of why each story clip was chosen, the WFE offers the writer a view into the reasoning behavior of the agents themselves, as well as a perspective on the storybase. The writer can then go back to the clip material or the story framework and make changes as she sees fit, according to the WFE feedback.

4.1.5 Presentation

Instead of a single stream or output frame of video, the Agent Stories provides a type of presentation unlike that of traditional television or cinema. Multiple streams of simultaneous video and audio, all under the user chosen story agent control, are presented in a dynamic mosaic form. The agents possess unique behaviors which control the dynamic screen design of the presentation. Similar to the WFE, the Presentational Environment performs the function of Branigan's "narration", in that it presents sequences the story elements with a sense of style.

4.1.6 Agent Scripting

The Agent Scripting Environment offers the writer a chance to define the logic behind the styles of story construction used by the story agents. While metalinear narrative designers will have access to ready-made story agents, the Agent Scripting Environment allows writers to create new story agents, and choose how they reason when trying to fill out a story framework.

4.1.7 Development Platform

The writing and presentation interface for Agent Stories was developed on an Apple Macintosh Power PC processor, using a software development system called mTropolis, from Quark, Inc. mTropolis is a graphical objected oriented programming language for the Mac. It clusters functionality and programmatic behavior into icons which can be readily adapted for a specific application. I chose mTropolis because it is especially well suited

[18] Though the theories behind Agent Stories were conceived by the author, it was through the efforts of a team of contributors that the software came into being. This, the third version of Agent Stories discussed in this document, was programmed primarily by Justin Kent, Anthony Young-Garner, Daniel Vlasic and myself. Justin designed and created the database, as well as wrote the Agent Scripting Environment, Anthony programmed the story engine and the Writer Feedback Environment, and Daniel completed the programming on the Representational and Agent Scripting Environments, as well as attended to an enormous number of bugs. At the printing of this document, Daniel continues work on the Presentational Environment.

for easily manipulating graphics, sound and digital video. There are a variety of interface features which are trivial to program in mTropolis, but which are much more difficult and time consuming in other popular languages such as Java.

The writing/presentation software communicates with a data server on a Hewlett Packard Vectra, which is running Microsoft Windows NT. The server software itself is running through NT's Internet Information Services and is designed using Microsoft Access. The interface protocol between the client and server process is SQL. This server setup was chosen because it was the simplest software configuration, with a high level of support in case of problems.

The overall client/server model was chosen because it represents the most likely model for implementing such a system in the real world. While it would have been much easier to implement an integration of both the client and the database on the same machine, the most likely production configuration of such a system would include a home device of some kind (the client) and the content/services provider (server), or in cable TV terms, the head end. The head end would house large collections of story clips and digital video data or metalinear story domains. The cable company would offer access to these metalinear story domains to its client base via a high bandwidth data connection. The client's device in this scenario would need to be a powerful television, with many computer workstation-like features: a CPU and RAM to run the software agents, a high bandwidth connection to the server along with a back channel for control and feedback, and a hard disk or some other form of non-volatile memory to store story agents, stories and even frameworks if necessary.

4.2 Story Structure

4.2.1 The Structural Environment

The Agent Stories Structural Environment provides the author with a space for creating and manipulating an abstract story structure for a metalinear story. The story structure or framework is expressed as set of narrative primitives. These primitives are loosely based on Branigan's seven narrative schema elements discussed in "Assembly in Multiple Ways" on page 51, and were chosen as a good first attempt at describing narrative building blocks for first person, multiple POV stories. The seven primitives are:

1) Speaker Introduction
2) Character Introduction
3) Conflict
4) Negotiation
5) Resolution
6) Diversion
7) Ending

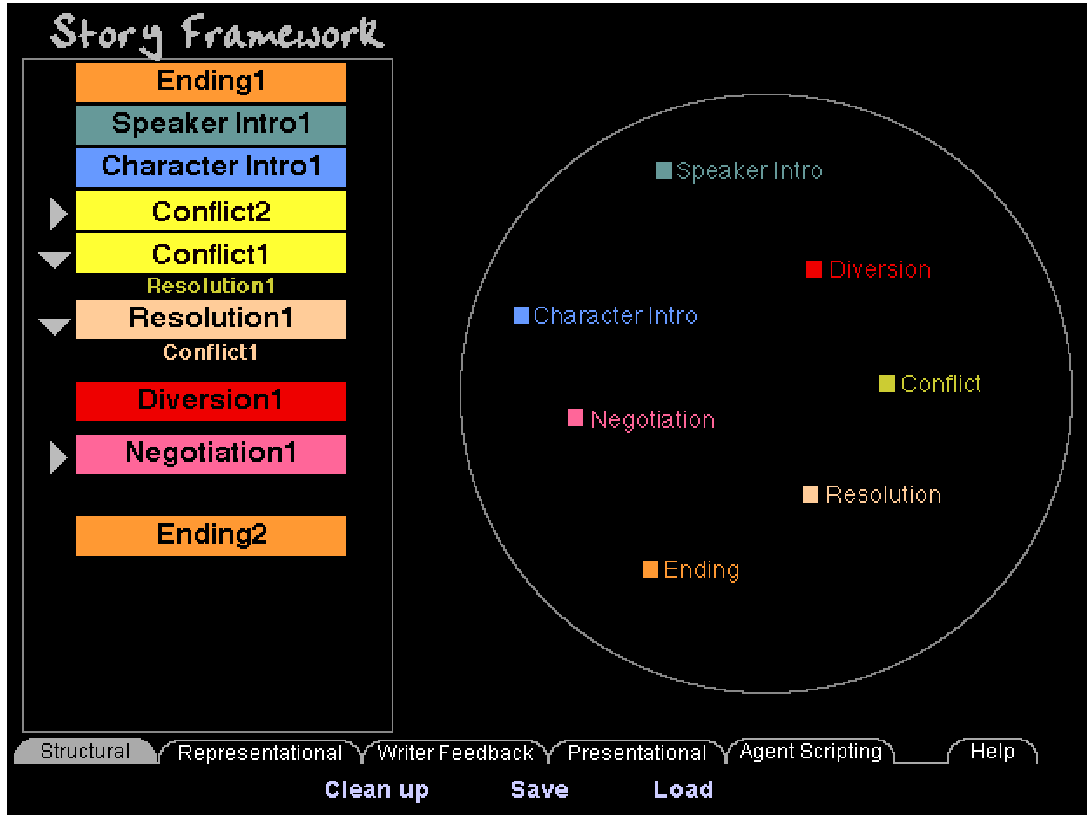


Fig. 20 A screen shot of the Structural Environment with a sample story framework. To build a story framework, the user drags the primitives in the circle across the screen and into the rectangle of the Story Framework.

In the Representational Environment these same primitives will be used as annotations, which get attached to story clips, for describing how a clip can be used. Here they offer a way of designing an abstract structure for metalinear story. The primitives SPEAKER INTROduction and Character Introduction convey something about who is telling us the story. Speaker Introduction is an introduction of a character, a way of knowing what kind of person a character is and thereby create some expectation for what that character is likely to say or do in other parts of the story. For instance:

> *My name's Joey and I've been a teamster all my life. I wake up at 5:30 in the morning, I'm at the job site by 7, I'm off by 3, in McCaffery's bar by 3:15 and home by 5– five days a week. My father's a teamster, too. He got me my union card. But my brother didn't think the teamsters were good enough for him – he's off wasting the family's savings on college.*

A character making this statement would set up certain expectations in the audience, which the writer would either satisfy or violate in further clips as she so chose. The Character Introduction is an introduction of the story's characters and setting from their own point of view. As such, certain facts would be mentioned or emphasized while others would be omitted as the character describes their world. Going back to our friend the teamster, one example would be:

> *So I'm working 21st floor of this sky scrapper down on Jefferson and 5th puttin' up sheet rock, and a bunch of us send this new kid, Patrick, out for coffee and bagels. Now looking down I could see Jefferson and the top of the Dunkin' Donuts down the street. Across the street there was this other site, a little five story office job where my pal Dougie's doing some electrical work. The traffic is thick -- ain't nobody movin'.*

A Conflict is a problem, predicament, or situation that needs to be solved. Resolution is a solution to a conflict. Together, Conflicts and Resolutions act as generalized versions of what Branigan and others refer to as an initiating event. Most initiating events are either single conflicts or a series of conflict/resolution pairs. In Agent Stories, RESOLUTIONS are directly tied to CONFLICTS: CONFLICTS can have multiple RESOLUTIONS, and RESOLUTIONS can have multiple CONFLICTS. Here is one example of a CONFLICT:

> *I heard this big crunch! I looked down and I could see the top of Patrick's yellow hard hat in between two cars that were pretty tight together. Patrick had been hit and was being pinned by two cars right in the middle of Jefferson. So I reach for my radio to call for help, but realize I didn't pick one up that morning, 'cause none of the radio batteries were charged the night before. The kid was hurt, I was his supervisor, and I didn't have any way of helping him.*

The primitive NEGOTIATION is about revelation through struggle. While CONFLICT represents either an introduction or a worsening of a complicating event and RESOLUTION is the solution to that complication, NEGOTIATION is about a character's struggle with the complication. A character's negotiation with a problem reveals more of the character's personality and can be useful for setting up future potential actions of the character. NEGOTIATION also represents a recognition that in life not all problems get resolved by the end of the story. While RESOLUTION acts as a termination of conflict, NEGOTIATION does not. NEGOTIATION continues a conflicting event by turning it around, revealing its other sides and facets. For instance, if a character in a story became addicted to cocaine, then having that character entering a drug rehabilitation program is not a resolution to his addiction, but a negotiation with it. The character could have also chosen to continue feeding their addiction, perhaps even stealing or embezzling funds from their employer to support their habit, or come up with sophisticated methods for hiding the ill effects of his addiction from the authority figures around him. This, too, would be a negotiation, as it does not resolve the problem any more than starting rehabilitation does. Rehabilitation does, however, give the audience an expectation of an eventual drug-free state -- again, an expectation which the writer can choose to either satisfy or violate in further clips.

Diversion is a story element which deviates or digresses from what would be considered the plot of a story. The plot being that part of a story which is often driven by Conflict/Resolution pairs. Diversions act as periods of information transference and tension relief, but do not directly drive the progression of the story. Comic relief is one example of a diversive period in a narrative. Anything that simply tells more about the character or situation, without contributing to the progression of events, can act as a diversion:

> *The nice thing about doing what I do is that I get to see the sky. On the street in between the buildings, you don't see the sky like you see it from the high steel. The clouds spread out for miles all around. And the trees! You barely notice the trees on the sidewalk. But from up there... from up there you see more trees than people. You see the way the world really is.*

The Ending is an overall resolution or summing up of the narrative. However, just as any narrative primitive can be placed in any order, there is no restriction regarding where the Ending occurs in the story. It can be located at the very beginning of the story framework, somewhere in the middle, at the end, or not be in the framework at all. For some stories, how it ends could be one of the least important parts of the story. This is especially true if the story domain is based on commonly known historical events; it is much more important to arrive at the eventual ending through any number of interesting and unpredictable paths.

Each of these narrative primitives describe sections of an intended story. Together, they offer the writer familiar elements for making the narrative flow from beginning to end. The writer builds the framework using simple colored blocks on the screen. These act as class prototypes for the seven narrative primitives. When the writer clicks and drags a primitive block, a new instance of that primitive type is created, numbered, and can be spatially ordered among the other narrative element instances. The order of the elements in the framework determine much of the flow of narration in the final narrative. While the theory behind these primitives is derived from the work of Branigan and other researchers mentioned earlier, much of their research is based on deconstruction – breaking down established linear narratives into their elemental parts. Metalinear research and Agent Stories seek to investigate how well these primitives work in a practical constructive application; i.e., can a writer use them to write with? Will a writer want to add more primitives? Will different types of writers want different sets of primitives?

4.2.2 Writing Structure

The order of the narrative primitives in the constructed framework can suggest certain narrative genres. For instance, it would make sense to start a narrative with a speaker introduction, so that the audience would immediately have a sense of who is telling the story, followed by a character introduction, during which the characters and setting are introduced, followed then by the narrative's first conflict. However, if the order of just these three simple narrative elements were rearranged to be: character introduction, conflict, and then speaker introduction, the resulting structure would resemble that of the beginning of a typical murder mystery; where first one sees the characters and setting, then the murder as the first conflict, followed by the introduction of the detective, around whose POV the story usually revolves. This is a commonly used structure for film and television mystery narratives like: Agatha Christie, Sherlock Holmes, and Colombo, and is recognizable by most western audiences.

Another important attribute of the story's structure is the linkage between conflicts, negotiations and resolutions. The structural environment provides a way for the writer to specify whether a conflict should be resolved at the next available resolution in the framework or perhaps strung out until a later resolution. By making such adjustments to the narrative structure, it is possible to affect the rhythm of the narrative by either repeatedly introducing and resolving a number of conflicts or introducing many conflicts one after the other, so that narrative tension is built to a higher level before any resolutions.

A related technique for writing structure is to link conflicts to negotiations, then link negotiations to resolutions. That is, link problems to struggles and then the struggles to the solution to the problems. This is, seemingly, a simple and straight-forward approach to story writing. However, when one considers that in a metalinear story the conflicts, negotiations and resolutions do not all have to be portrayed from the same point of view, then a simple structure like this one becomes much more complex. For example: character A describes a problem, character B describes the struggle with that same problem, then character C describes the solution to that problem, a solution which might not be valid from character A's point of view. In fact character A may not mention anything about C's solution in all of A's clips. That resolution exists purely from C's frame of reference to the story world.

Added complication to the above structure, is that while conflicts can be linked to negotiations, which can in turn be linked to resolutions, they do not have to be linked in that order. The story's structural framework could include a resolution first, then a negotiation, then a conflict. A writer could be challenged to design stories told in this "reverse" order as a way of revealing new facets of certain types of conflicts. This is just one of the ways the Structural Environment of Agent Stories allows the writer to play with the narrative structure of a metalinear story. And play is an important word to use here. By stacking and re-stacking colored blocks, a writer is given the opportunity to try out new story structures quickly and easily, and perhaps even have a little fun. As discussed in chapter 5, what has been learn through constructionist learning research is that people learn better when given the opportunity to construct something that is personally important to them using building blocks provided in a tool. (Hooper, 1996)

4.3 Story Clips and Connections

4.3.1 The Representational Environment

The goal of the Representational Environment of Agent Stories is to express a useful and efficient way of intelligently reasoning about the elements in a story domain. In some ways this is similar to Roger Schank's work with software agents in a story archive, where he and his colleagues proposed a method for software agents to choose and sequence full stories related to a given search criteria. (Schank, 1992) In Schank's work, entire stories needed to be annotated or pre-linked in some way by an intelligent human archivist. In Agent Stories, story fragments or clips are annotated through the use of a graphical user interface.

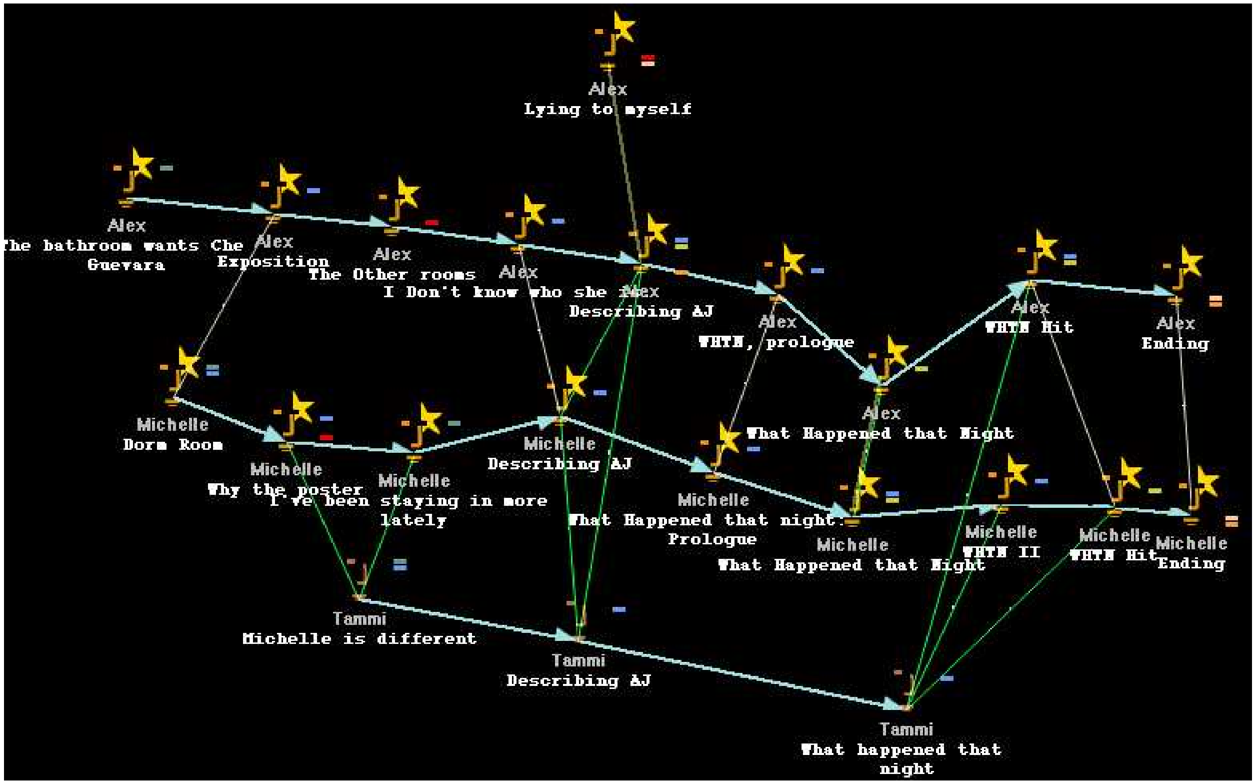


Fig. 21 Screen shot of the Representational Environment displaying a story. This writer chose to enforce a temporal progression using many *causal precedes* links.

The Representational Environment allows the writer to draft knowledge and reasoning about the narrative into a narrative landscape. In the Representational Environment, a clip is defined as a story element with its text written from a single first-person POV. For the writer, a clip is first a piece of text which tells some portion of a story. Further along in

Fig. 22 Main Character icons: inactive and active.

Fig. 23 Minor Character icons: inactive and active.

Fig. 24 Dramatization icons: inactive and active.

the production process, once the text has been adequately rewritten and approved, a clip may be represented by a piece of digital video or sound shot specifically for the text, for use in the Presentation Environment. There are four types of clips which the writer can choose to add to the metalinear story representation. The clip types are: Main Character, Minor Character, Dramatization, and Sound. Each of the four types represents a different type of story granule and, therefore, is dealt with in a different way by the Agent Stories software.

A Main Character clip is a story clip from a major character of the metalinear story. It is a character which includes some of the most important clips according to the writer, and whose clips most likely number among the highest in the collection. Main characters are the dominant characters of the story.

A Minor Character clip is a story clip from a character who does not play a major role in the metalinear story. A minor character may only comment about certain major characters without expressing anything about their own lives. A minor character might only speak about things other than what the core issues of the metalinear story collection are concerned with. Minor characters play a supportive roll and add color to the overall story experience.

A Dramatization clip is a visual representation of either a main or minor character's statement. While the main and minor character clips are first person accounts of what happened or what that character is thinking, the dramatization clip shows what happened or what a character was thinking from a specific character's point of view. One could think of it as the movie camera's eye on the scene that a character is describing.

A sound clip is a piece of sound which describes the scene, or is in some way supportive of a main or minor character's point of view. Just like the other three clip types present a single point of view in their own way, a sound clip presents a single point of view as well. For instance, if a train struck a tractor trailer at a crossroads, the truck driver's account might be that the train seemed to come out of nowhere because the warning lights and bell did not go off. [19]But from the account of a witnesses on the scene, the flashing warning lights and ringing bell did indeed go off. These two different first person accounts could have different supportive sound files associated with them, one with the bell and one without.

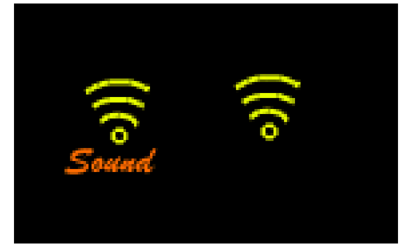


Fig. 25 Sound icons: inactive and active.

Each clip, no matter what type, is connected to at least one other clip with the use of links. Agent Stories' links are defined as:

1) factual precede
2) causal precede
3) must include
4) supports
5) opposes
6) conflict<->resolution

[19] This is an actual event which occurred during the writing of this thesis on March 15, 1999 near Chicago, Illinois. The truck driver insisted that the warning bell did not sound, though there is evidence to the contrary. Eleven passengers of the commuter train died as a result of the accident. And though seemingly gruesome, the event and the lives involved would make a great metalinear story.

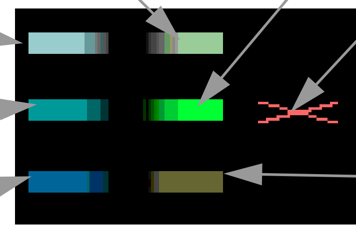


Fig. 26 The activating buttons for the six link types, plus the link eraser. This panel is located in the Representational Environment tool palette.

The collection of link types is somewhat arbitrary. All but conflict<->resolution were chosen from my own experience in writing and telling stories. I wanted to define a minimum of links types so as not to burden writers with too many choices, while also providing writers with powerful elements for narrative annotation and construction. The link type conflict<->resolution is a member of the collection in part because of my own experience in story construction and in part because of the culture within which I tell stories. Western cultures typically construct plot based stories. While there are many ways of defining plot, the method I use here is a series of conflict/resolution pairings. The more pairs of matched conflicts to resolutions, the longer or more involved the plot. This can clearly be seen in Hollywood movies. The typical overarching plot of a Hollywood movie involves a central character or characters getting into trouble or dealing with a problem, followed by that problem getting struggled with or solved, followed the introduction of another (usually bigger) problem, followed by a solution, and so on. For action movies, the sequence is: something explodes, the hero escapes, something else explodes, the hero escapes again, something bigger explodes, the hero gets away again, and so on. The audience gets tied up in following the plot of the hero getting in and out of trouble along the way toward achieving his/her ultimate goal, that is, resolving their longest running conflict.

The links are activated through the six colored buttons on the bottom portion of the screen, in the diagram above. Each of these links describe a type of relationship between two clips, and each clip can have many such links. The factual precede and causal precede links are sequence specifying links meant to identify pairs of clips, where information contained in one needs to be seen before the other. Factual precede refers to one clip preceding another because a fact or object in one clip needs to be identified or dealt with before the other clip is experienced. For instance, if in one clip a gun is described as hanging in a gun rack above the fireplace and in another clip the gun is missing from that gun rack, then if it is more important to the writer to convey that the gun was removed rather than placed in the rack, a factual precede link would be drawn from the first clip to the second. If it is not important which clip is shown first or if the writer feels that it is more interesting to have the two clips shown in different orders in different story playouts, then such a link would not be placed there.

Causal precede refers to events in one clip causing events in a second clip, therefore a specific sequence is recommended. Both the factual precede and causal precede links do not specify that one clip must immediately follow or preceded the other or even that the second clip must be included in the story, but simply that if both clips are chosen, then there is an order in which they must be viewed.

The must include link specifies that if one clip is chosen, then the other clip must also be chosen, with no specified order to the clips. For instance, if character A is shown kissing character B from character A's point of view, a writer may think it important to show the same kiss also from character B's point of view, as the two views may tell different stories about who kissed whom.

The conflict<->resolution link specifies that a conflict clip is resolved by a specific resolution clip or set of resolution clips. Conflicts can have multiple resolutions and resolutions, multiple conflicts.

The supports and opposes links offer the system a way of understanding, to some extent, the relationship between the story's characters, by specifying that the meaning or message offered in one character's clip is in opposition to another character's clip, or that two clips from different characters are supportive of each other. For instance, if after a big lover's quarrel character A claims in one of his clips that he has made up with character B and character B claims in one of her clips that she has made up with character A, then the two clips (not the characters) are in support of each other. If, on the other hand, character A claims that they made up and character B claims that they have just stopped arguing for a while, but that the key issue of the argument still remains, then these two clips are in opposition to each other. It is important to note that only clips can be in opposition or support of each other, not the characters themselves. While later in this chapter there is a discussion about the criteria story agents use to choose characters, including comparing the number of oppositional and supportive links as a way of them picking the most or least supportive characters in general, an agent will still not be able to say that one character is in opposition to another because the agent can not read the story text.

Through this collection of clips and links, a web of story or storybase is defined which can be navigated by traveling its links as narrative paths. The web of linked story clips are not so deterministic that the next clip in a constructed narrative is always one hop away from the previous clip in the storybase. The arrangement of the structural framework in the Structural Environment has a very strong influence on which clip follows which, such that the next logical clip to be chosen may be from a totally different part of the storybase. Such decisions are dependent on the framework and the active story agent.

In addition to the links, story clips are also annotated with the same key words used in the framework of the Structural Environment. The terms Speaker Introduction, Character Introduction, Conflict, Negotiation, Resolution, Diversion and Ending make up a set of buttons which can be activated in any combination for each clip during the clip creation and editing process. By activating one of these buttons, the writer is identifying the clip as being of that button type. When a clip type button is activated, a small line with the same color as the button is placed to the right of the story clip icon as a reminder of how the clip is annotated.

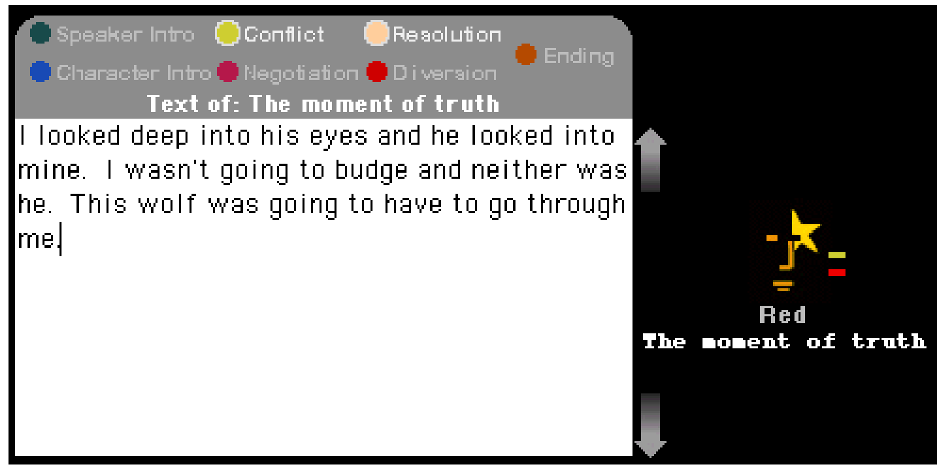


Fig. 27 The clip text box for the main character "Red," entitled "The moment of truth." This clip is marked as both a Conflict and a Resolution, and thus can be used in more than one way.

When a story agent constructs a story, it looks not only at a clip's links, but also at its assigned clip types to determine appropriateness for any given situation. The story agent essentially tries to match up the type of each clip with the framework primitives it tries to satisfy. If a story agent were trying to find a Character Intro clip to place in the story, for example, it would look for clips identified as a Character Intro. If there the collection of story clips included one clip identified as a Character Intro, while the other story clip was identified as a Character Into and a Conflict, then both story clips would be eligible for use in this part of the story. The story agent would then have to use another part of its story construction behavioral programming to choose which clip would be the most appropriate.

4.3.2 Underlying Database

The database on the server is stored as a series of records, where each record corresponds to a single story clip. The various fields of each record store pertinent information about a clip, including character name, title, story text, link data, movie reference data, etc. All data in the database is stored as structured text, which gets parsed by the Agent Stories client software.

4.3.3 Writing Representation

How would a writer create a representation of their metalinear story that makes sense and which provides multiple ways of constructing a linear story playout? The key lies in the first person characterizations. Consider the previous conflict with our teamster on the 21st floor. He heard a crunch and saw the kid pinned between two cars in the middle of a busy downtown street. Who else could have been on that street? A woman happened to have been walking by. If we were experiencing this as a linear construction, we may or may not have heard her Speaker Introduction and, therefore, gotten to know a little more about her, as we did the teamster. What follows is her CHARACTER INTRODUCTION:

> *What I was trying to do was hit the ATM on Jefferson, run in to buy tampons in the convenience store on 5th, then get back to the office before anyone knew I was gone. But as I passed a construction site I remembered how when I was a kid I used to love playing in those places. My friends Donna, Joey and I use to climb the big mounds of dirt playing king of the hill, and threw dirt bombs at the steel girders to see if we could get that "ping" sound just right. I'd come home with my*

clothes caked with that light brown dust – my mother was so pissed – but I loved the feel of running and rolling around there. Those days are long gone.

Character Introductions, which describe a place and the people in that place, can often also function as Diversions, as in the case of the text above. While we see Jefferson Street a little more clearly, we also see other streets and especially the construction sites of the woman's youth. We can hear the woman's passion for play. Her version of the conflict could then be:

As I passed the plywood wall of the construction site, I heard a loud crunch and people just leaning on their car horns behind me. I turned around and saw the head of young man in between two cars in the middle of the street. It looked like he was hit, trapped between the two cars. I didn't understand why the car in back didn't just backup.

Both the Character Intro/Diversion and the Conflict of the woman are generally in support of those same elements as told by the teamster, Joey. At least, they do not disagree with each other.[20] Therefore, supports links can be made between these two clips. Additional Character Introductions and Conflicts can also be made by this same character, which could be in opposition to each other. To add texture to the different story constructions, the writer can include many oppositional versions of the same type of elements from the same character. We could have heard a very different Character Introduction from the woman, which does not include her history in construction sites, and does not hint that perhaps the Joey of her past could be the same as the teamster.

Another point of view which can be included is the kid's. Pete's Character Intro:

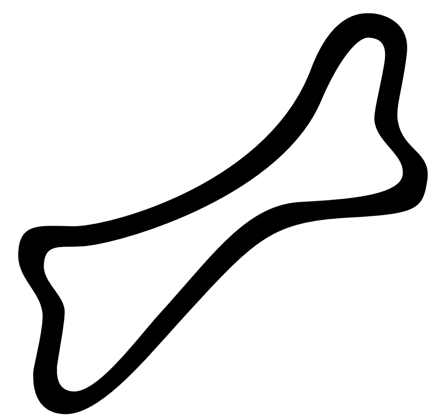
[20] There are few absolutes in the universe, fewer still in the art of writing. The metalinear narrative writer will need to choose how to handle situations where two of their clips are neither clearly supportive nor clearly in opposition. While it may be difficult to decide which link to use, supports or opposes, choosing neither would not help one of the missions of Agent Stories; that is to make narrative choices which mean something. No link means no choice can be made. This issue points to a possible area for further development of Agent Stories – developing new links for new kinds of story material.

First job, man-didn't wanna blow it. Sent me out for coffee again. They could eat some serious pastries, those guys. Loved the elevator though – cool – no walls – the earth just comes up to ya'- says hi. The street was a parking lot, man, no room to walk, no room to cross. Missed my skate board. These guys would have had a cow if I brought it in.

It is easy to see how more versions of the same story elements could be written to suggest or emphasize different facets in the lives of these three characters. Some versions may not include the accident, but instead focus on the woman's childhood. Other versions may focus on how Joey sees the world around him. Most importantly, these three characters are drawn out of an everyday world to allow us as audience to see our own world though a different and ever differing lens. By reconstructing the linear stories from the metalinear structure, and by repeatedly adding to the story representation, the end results are ever evolving.

Minor characters give flavor to the metalinear story by commenting on the main characters, or by just commenting on life as a part of the story world. Because they are included in the story world, their presence affects the overall impression of the linear stories. For example, in the midst of the crowded city streets live the invisible people that most of us just walk right past. This woman is one of them:

I brush my hair with this bone. Like it? I saw it in a movie once. There was this woman who lived way out in the woods in a shack with animals and plants all over. No one could touch her 'cause she was magic – scared off all the hunters and princes. She hung bones to dry on a string she ran from one end of the shack to the other. And as she brushed her hair, you could just see it in her eyes... you knew!



Provocative minor characters like this one can be linked supportively to any number of main character clips. As certain minor characters continue coming back, they can act as foils or voices of wisdom for main characters, offering contrast or advice.

Dramatization and sound clips would most likely be linked to main and minor characters through supports links, acting as visual and aural descriptions of what the character is talking about. Dramatizations and sounds could also be linked with certain clips, using opposes links as well. By claiming that a dramatization is in opposition to a main character's clip or is in opposition to another dramatization, the writer is further defining the meaning of the character clips. Story agents could potentially have the ability to use structures, like character clips linked through dramatizations, as a way of understanding the story more, and therefore telling it differently.

4.4 The Iterative Process

The writing process is a complex one, with many different perspectives and approaches as to how it is done. One area of research which has yielded revealing insight into the writing process has been Cognitive Science. Recent research has made clear that the writing process has both a parallel and iterative nature. (Hayes & Flower, 1980; Smith, 1994; Torrance, Thomas, & Robinson, 1996) It involves the creation of the initial germ of an idea, followed by an ever cyclic pattern of evaluation, inspiration, recreation and evolution. The writing process for metalinear work is no different. The writer will still need that cyclical evaluative process known as rewriting to bring her work to full fruition. Similar to what Hayes and Flower did for expository writing in their research[21], a goal of this research is to develop a model for the metalinear narrative writing process. This pro-

21 Hayes and Flower developed a model for students learning expository writing by focusing on the rewriting process.

cess model will involve the Structural and Representational Environments described earlier, as well as an environment which gives the writer feedback about how her story can be told. This feedback allows the writer to return to her text and make knowledgeable changes and additions. The environment providing this function is aptly named the Writer Feedback Environment.

4.4.1 The Writer Feedback Environment

The Writer Feedback Environment (WFE) of Agent Stories is where story agents with goals of narrative construction, combine the story framework of the Structural Environment with the story representation of the Representational Environment. Different story agents construct narratives in different ways according to their own particular style. The writer employs the different agents in constructing and presenting her version of a linear story using the metalinear storybase from the Representational Environment and story structure from the Structural Environment. By constructing a linear story and providing a textual explanation of why the clips in the story were chosen, the WFE offers the writer a view into the reasoning behavior of the agents themselves, as well as a perspective into the storybase. As in the phrase "Actions speak louder than words," here the author is able to see, learn, and respond to the actions of agents as they form several linear constructions. The goal of this environment is to offer the writer feedback which will promote further metalinear narrative development, making the system genuinely helpful to the writer while not being dictatorial or overly confining.

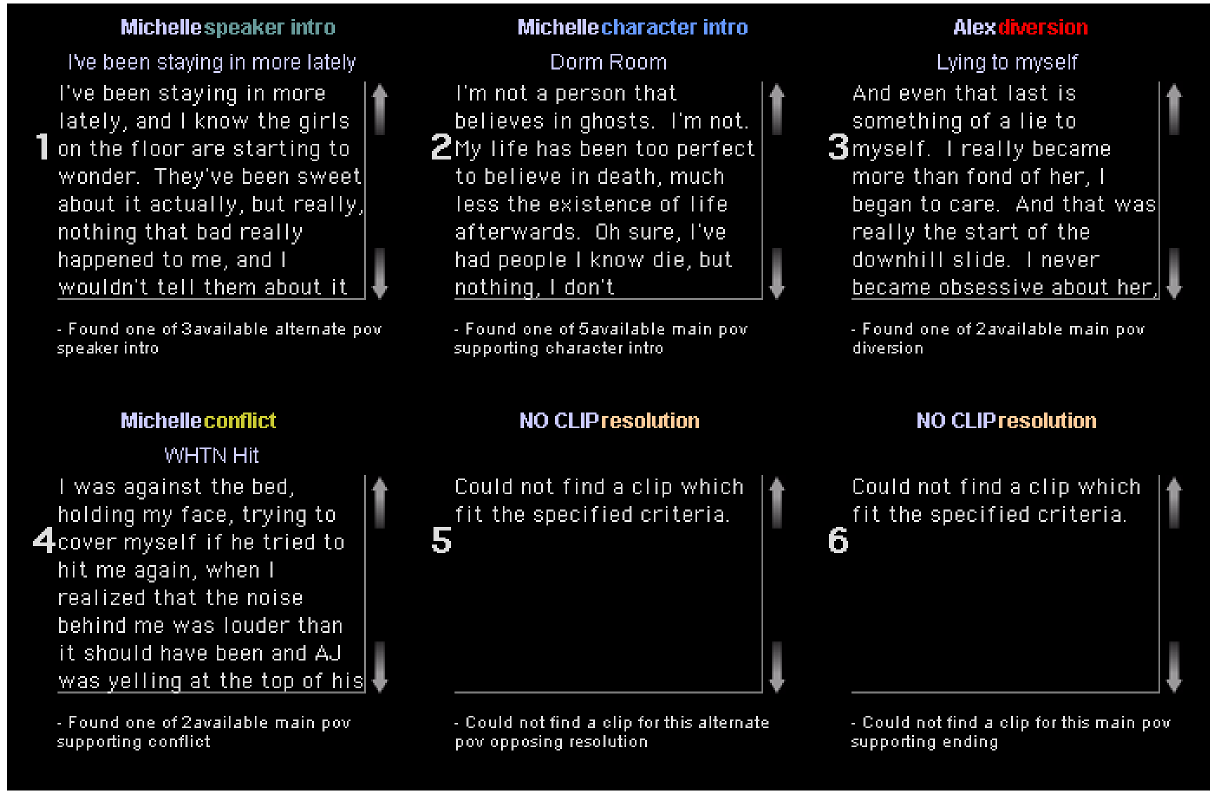


Fig. 28 Screen shot of the Writer Feedback Environment displaying the a story with feedback. These results are from an early stage in the story development process with Agent Stories.

As will be discussed in further detail later in this chapter, the story agents have differing behaviors associated with how they choose which clips to include in a story. Each agent has a different construction technique or set of preferences which the writer uses to see their story in a different way. While the Agent Scripting Environment allows the writer to create their own custom agents, there are five story agents which come predefined with Agent Stories. These stories agents are named: Bob, Carol, Ted, Alice, and Isadora. Each story agent has an associated textual description of how they perform their task, as can been seen in Figure 29.

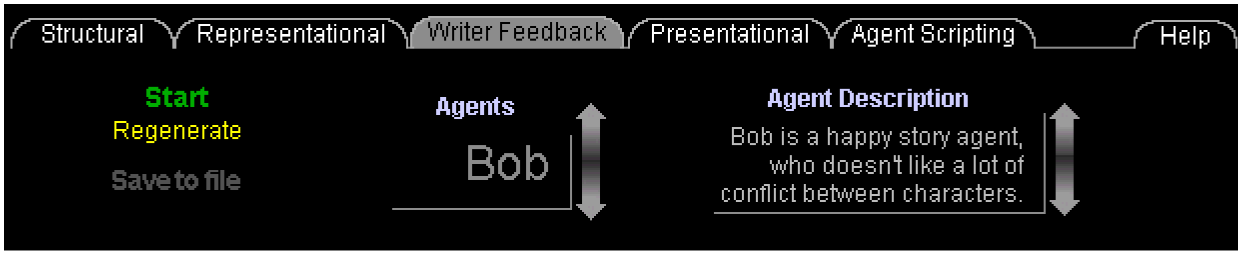


Fig. 29 The Writer Feedback Environment tool palette. Bob is the shown as the currently active story agent.

When given the task of constructing a narrative, each agent first chooses a main POV character among the various characters represented in the Representational Environment. The POV character forms the basis of other choices the agent must make later in the narrative construction process. This choice of POV character is the first decision situation for a story agent's behavior. Does the agent choose a character with a lot of oppositional links among its story elements? Or instead does the agent choose a character with a lot of supportive links? These are not mutually exclusive. Does the agent choose a character with the greatest number of overall links to other story events? Or perhaps the agent could choose a character with the greatest number of factual or causal precedes links -- that is, characters which could be thought of as having clearly labeled sequential paths through their story events. Choosing a POV is just one situation handled by agent behavior.

The other situation when the agent must make a choice is when they are choosing clips for one of the seven types of narrative primitives of the story framework. For each of these primitives, the story agents can have very different decision making styles, and therefore, different styles for constructing story. The styles of the five pre-defined agents are embodied in their agent descriptions, which appear to the right of their names on the WFE screen. The purpose of the agent description is to state, in plain language, how the agents work in order to help make Agent Stories more approachable by a non-technical writer. The descriptions are an expression of the way that each story agent searches through the storybase. What follows are the descriptions of the five story agents and how they each work.

Bob: Bob is a happy story agent, who doesn't like a lot of conflict between characters. He'll avoid using characters who don't play well with others.

To avoid inter-character conflict, Bob seeks out Supports links between his Main POV character and the other characters. He will avoid Opposes links whenever possible as a way of avoiding the situation where one character says one thing and another character says that something different is true. Therefore, Bob will favor certain story domains in which characters generally agree with one another. This is not to say that Bob avoids conflicts, both in the general sense and the Agent Stories sense. It is just that Bob would construct stories more of the man vs. nature type rather than the man vs. man type.

Carol: Carol is a one-sided story agent. Carol will weave in lots of versions of conflicts, but with only one resolution.

As a one-sided story agent, Carol chooses a main POV character in the beginning of the narrative, and during sections of conflict (as stipulated by the story framework) she will first show the conflicts from characters POVs opposing her chosen Main POV. She will then show the conflict from the Main POV, and finally, during sections of resolution, will show only the resolution from the main POV, thus leaving the other character's conflicts unresolved. Carol generates narratives which resemble a common structure of western political commercials: My opponent believes that the problems of the city are X, I believe that they are Y, what I'm going to do about them is Z. Though the conflicting POV of the opponent is stated, and even stated first, it is discredited because that conflict is never resolved. Only the Main POV conflict is resolved. To tell an entire story using this structure means that the audience gets to experience the many different POVs of the same set of problems, but only one solution. This style can work in a number of ways, depending on the story domain. It could certainly be used to reinforce one character's dominance during the story: Yeah, those guys saw the world this way, but they're nuts – 'cause I'm right. However, it could also be used in some story domains to emphasize the unfairness of looking at any issue in such a narrow manner. The singular (American, European, Christian, Jewish, middle class, upper class, black, white, etc.) choice of resolution seems all the more narrow given the larger context presented by the conflicts. Perhaps the larger the core issue (war, famine, racism, etc.) the clearer Carol's one sidedness becomes.

Ted: Ted is a point-counterpoint story agent. Ted will try to show lots of perspectives of conflicts and resolutions. Ted's strong point is depth, but not brevity.

Ted is a good agent for constructing an entire narrative in the form of a debate. Ted's style is modeled after an old segment from the CBS television news magazine show 60 Minutes. In that short segment, called Point-Counterpoint, two correspondents, a man and a woman, took radically opposed sides of the particular issue of the week. Their comments on the issues often came dangerously close to personal attacks on the other person. The segment was informative and entertaining because the two correspondents were so opposed to each other.[22] Ted's style for constructing story capitalizes on Opposes links between story clips. Every time a conflict is required according to the story framework, Ted will choose the Main POV character's conflict and then all of the opposing conflict clips. When that conflict is resolved, the Main POV character's resolution is chosen, followed by all the character resolutions which oppose the Main POV. In doing so, Ted constructs stories which could be seen as fairer because all sides are heard from, perhaps at the cost of clarity, and certainly at the cost of brevity.

Alice: Alice is a "open ending" story agent. Alice will try to make the ending of any story a mystery - even to the author of the story.

Alice is one of the more experimental story agents, in that it was clear from her conception that she will work well in certain story domains and not at all well in others. Instead of merely choosing clips from the story domain in a clever way, Alice chooses clips, as well as manipulates the story framework. The story framework is an authored structure for narrative just like the web of connected story clips – so why not manipulate that, too?

[22] This segment was later regularly parodied on the NBC comedy show Saturday Night Live, which demonstrates how this style can work equally well on serious and comedic material.

What Alice attempts to do is quite simple. In looking at the story framework, if the situation exists that a resolution is the second to last item in the framework followed by an ending, then that would correspond to a very common story ending structure – one in which both the resolution and ending are not just important, but tied together in some way as interdependent narrative pieces. Therefore, Alice will throw one of them out, such as the ending. As the "open ending" story agent, Alice can not come up with a new ending which the author never imagined, wrote down, and placed in the story representation. Alice can, however, keep the ending a secret from the audience. She lets the audience come up with an ending themselves, in their own imaginations, based on all of what they have seen before. Since the author has prior knowledge of Alice's construction behavior, the author will have to decide if Alice is an story agent that he or she will want to take into account in their story writing. This requires that the writer let go of the control they usually have over a story.

Isadora: Isadora is the love child of Carol and Ted, and thus has characteristics from both.

Another more experimental story agent, Isadora, attempts to blend the styles of both Carol and Ted. Isadora does this by mixing the different ways that Carol and Ted balance the conflict-resolution parts of their reasoning, with other parts of their reasoning, such as Speaker Introduction, Character Introduction, etc. Both Carol and Ted focus on Conflicts and Resolutions in constructing their stories. However, those parts of the stories are setup by the Speaker and Character Intro's. As a one-sided story agent, Carol will choose a speaker and character intro from her chosen Main POV character. As a more equitable story agent, Ted will try to give more than one character's POV for both the speaker and character intros. Isadora, who still must choose a Main POV, will split up her choices of speaker and character intro. She will choose only one clip for each, but not from the same character.

4.4.2 Feedback

The WFE offers the writer feedback in either one of two forms: a textual form or a sketchy media form. The textual form is a story construction composed purely of the writer's text. The format of this display has some resemblance to that of either a prose story or a screenplay. The sketchy media form resembles a cinematic storyboard and gives the writer access to the text as well as to the digital video and sound representations of the text (if such video clips exist). After loading a story framework in the Structural Environment, and a storybase in the Representational Environment, all the writer must do in the WFE is choose a story agent and hit the start button, which generates the textual storyboard. The storyboard interface helps the writer in the ongoing metalinear writing process. In traditional media, the writer often works to a deadline, after which other contributors (producer, director, editor, photographer, cinematographer, etc.) take over to further construct and produce the story. In a metalinear story, the media is ever constructible and the construction process ever flexible. Additional material can continue to be added, and old material representations changed, on an ongoing basis. Therefore, the writer can continue to create more characters, events and representations for further production, even after an initial production effort has been completed.

To construct a new version of the story, the writer simply has to choose a new agent from the agent selection portion of the tool palette at the bottom of the screen, then click the start button to clear away the previous story blocks (if there are any) and create new ones. However, if the collection of story clips in the Representational Environment is significantly large, the same story agent may construct a different story, because, given a lot of clips to choose from, random choices are more likely.

While the intent of the agents is to make choices based on style and purpose rather than random luck, a balance must be struck between machine power and authorial control. The power of the machine is related to the depth and complexity of its logical reasoning. The more power the computer software has, the more sophisticated its decisions. That sophistication comes at a price, because the deeper the reasoning system, the more annotation and representation of the clips the author has to do in order to take advantage of that sophisticated reasoning. In other words, the more work the computer does, the more work the human author does. The balance that must be struck lies in giving the author a storytelling system powerful enough to construct compelling stories while not also saddling them with so much knowledge representation overhead that they never want to use the system in the first place.

4.4.3 How to Interpret Feedback

As stated earlier, the writing process is a cyclic one. Rethinking and rewriting are the most time consuming tasks of the writing process. Agent Stories supports this process by offering the writer feedback about their story – feedback which the writer can then use to make necessary changes in the other environments. The feedback is in the form of short textual explanations for why the story agent made the choice it did for each clip.

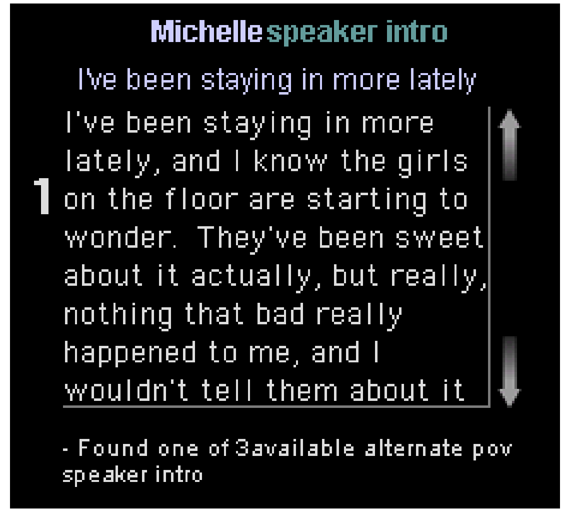


Fig. 30 A story box with feedback from the currently active agent.

The feedback text comes in two categories: explaining what the agent could not find, and explaining what the agent did find. The explanation text for each clip box can include text from both categories. Listed first is what the agent could not find, then what the agent could find. The text explaining what the agent could not find is provided in a statements such as:

– Could not find any Main POV Supportive Conflicts
– Could not find any Alternative Oppositional Character Intros

For each attempt and failure at finding a certain type of clip, the Agent Stories story engine provides feedback about it so a writer could go back and edit their story material, adding, for instance, more conflicts or character introductions.

The reporting of successes in the WFE comes with a little more detail and finesse. Since the goal is not just to blurt out negative comments, but also to provide the writer with detailed positive statements, the reporting of success happens as a concatenation of sentence parts depending on what was found. There are four parts to each success sentence: the opening, the number detail, the link attribute from the Representational Environment, and the primitive type from the Structural Environment.

There are two different success sentence openings: Found and Randomly chose. Found is used in three cases:

- When the agent was looking for one clip (i.e. a single supportive conflict) and found exactly one clip.
- When the agent was looking for a clip from a specific character (i.e. a speaker intro by Bob)
- When the agent was looking for multiple clips which satisfy a certain criteria and found them.

The opening phrase Randomly Chose is used only when the agent was looking for a single clip of a certain type and found many of them. The intention is to let the writer know that the agent could have made a number of different choices at that point. If the agent randomly chose a clip which has a strong bearing on what happens later in the story (like a conflict which is linked to specific resolutions), then this random choice signifies that this agent would very likely tell the story quite differently next time because the different conflict could also mandate a different resolution and thus a different story – a useful thing for the writer to know.

A success sentence can have one of three different number detail pieces. They are:

- this
- this one of X available
- this one of X requested

The number detail piece this is used simply in the case when a single clip was requested and a single clip was found; i.e. Found this…

The "X" in the second and third pieces refer to the number of found clips of the particular type that the agent was looking for. one of X available is used when the agent was looking for a single clip, but found more than one, whether the request was for a specific character or not. For example: Randomly chose this one of 3 available… or Found one of 2 available…

The number detail piece this one of x requested is used when many clips of a particular clip type are found according to the agent's behavior, and when the agent has found as many as it could. There is one clip box on the screen for each clip the agent finds. The agent will try to satisfy the number of requested clips and display as many as it finds up to the requested number. For example, in the success sentences under each of those clip boxes, the final line would read, Found this one of X requested… The writer would know how successful the agent was in satisfying this behavior by comparing the number requested to the number of clip boxes on the screen. Though there are no clip number restrictions, it appears that the number of clips requested would typically be small, on the order of 2 to 5.

The link attribute part of the success sentence refers to the type of link made between clips in the Representational Environment. It also refers specifically to the behaviors in the Agent Scripting Language as described in section 4.6. Since the story agents have behaviors for choosing a main POV for each construction and weaving their construction around that POV, their success sentences also reflect that main POV choice. Some examples of this sentence part are: Main POV Single Supportive, Alternative Multiple Oppositional, Main POV Single Oppositional, etc. Examples of the success sentence for the three parts up to this point would be:

- Found this Main POV Single Supportive…
- Randomly chose this one of 3 Alternative Single Oppositional…

The final piece of the success sentence is the primitive type that the agent was looking for, as stipulated by the active story framework in the Structural Environment. The same seven narrative primitive types that are in the Structural Environment are used here: Speaker Introduction, Character Introduction, Conflict, Negotiation, Resolution, Diversion, and Ending.

When all four of the success sentence parts are concatenated, they resemble the following examples:

1. Found this one of 2 requested Alternative Multiple Supportive Conflicts.
2. Randomly chose this one of 5 available Main POV Single Supportive Character Intros.

If a writer using the WFE received example 1 as feedback, it would mean that the agent was trying to find two conflicts supportive for the main POV character's conflict, but not actually belonging to the main POV character. This sentence would ideally be at the bottom of two clip boxes. If this sentence is on the bottom of just one clip box, then it means that the story agent was unsuccessful at finding both clips. The story agent's inability to find another clip is not listed as a failure however, because it is not a complete failure – it did find one of the clips.

If a writer using the WFE received example 2 as feedback, it would mean that the agent was trying to find only one character intro for the main POV character and instead found five. The agent then made a random choice between the five to produce the one chosen clip. This type of feedback in important because it is crucial for the writer to know what parts of the story he has a lot of material for and what parts remain lacking. If the agent is making a random choice between several clips in one part of the story, and able to find no clips for another part of the story, then the writer will be able to see where she should focus her efforts.

There is one remaining possible feedback which the Agent Stories system is able to give the writer – if no clip could be found for a particular purpose. In such a case, an empty clip box is placed on the screen in the proper sequence location where a successfully chosen clip would be. Underneath the clip box are listed all the appropriate failure sentences, indicating the sorts of clips the story agent tried to find but was unable to. The one piece of text inside the clip box, where the clip text would normally be, is the simple statement:

Could not find a clip for this XXXX.

The feedback simply tells the writer that a clip was not chosen and for lists the reasons why. The writer is then free to go back to the Representational Environment or the Structural Environment to make changes so this event will not happen again. The writer also has the other story agents available. Where one of the agents could not find a clip for a particular place in the story framework, one or more of the other agents could very well find a clip for that same place, as their behaviors have them making different choices. By polling the various agents or even by scripting their own agent and having that agent construct the story, the writer has the ability to see many different sides of their story and rework the different parts as they see fit.

The familiar cyclic writer's pattern of change–read–rethink-change-read–rethink is maintained in Agent Stories because the software agents output food for rewriting thought. The resulting process is one where the story evolves during the writing process. Not only does the text become better, as it should over any writing process, but the representation and the body of work becomes stronger as well. The details of the writing process and case study examples will be discussed in chapter 5, Authoring and Evaluation.

4.5 Presentation

Instead of a single stream or frame of video, the Agent Stories design includes a type of presentation unlike that of traditional television or cinema. The intent is to present multiple streams of simultaneous video and audio, all under user chosen story agent control. The story agents possess unique behaviors which are used to choose clips as well as control the dynamic screen design of the presentation. The Presentational Environment is the portion of Agent Stories where that presentation takes place. Similar to the WFE, the Presentational Environment performs the function of Branigan's "narration", in that it chooses and sequences the story elements, presenting them with a sense of visual style. Sequencing choices are made according to the framework in the fullest possible way for the benefit of an audience. The constructed stories are presented with a sense of style through the use of the same story agents used in the WFE. As the embodiment of the reasoning necessary to construct narrative using this computational model, story agents provide both the writer and the audience a method of experiencing story as best suites their needs. The Presentational Environment is not a writer's input/manipulation space, but instead a final video output device for both writer and audience. Here audience refers to those who would simply watch one or many linear cinematic presentations of the writer's metalinear story, which has been produced into the form of digital video, audio and stills.

The object of the Presentation Environment is to give the audience/user the ability to construct stories without having to know about the background technical details, such as knowledge representation, abstract story structure, and story agent scripting. The audience/user would simply need to sit down in front of the monitor, choose a story agent by name, and hit the START button to have that story agent create the story, just as in the WFE. The chosen story agent looks at the characters in the story domain, chooses one as a Main POV character, then weaves a narrative in the method described earlier by following the sequence of narrative primitives in the story framework. Once a sequence of clips has been chosen, the system plays them. Because the story agents come to the story domain fresh every time they construct a story, there is no reason for the story representation to ever be considered fully constructed. The writer and production team can continue to add new story clips and delete old ones such that the story domain continues to grow and evolve, resulting in ever changing narratives.

4.5.1 Screen composition

Because it is not the primary focus of this research, the screen composition has been kept very simple in order to ease development. Whether this environment is developed in a simple or complex manner, however, the fundamental idea remains the same. The computer screen is not limited to a single frame, as is the television screen. The space, therefore, can be used in a multitude of creative ways. The agents approach the task of arranging frames of video on the screen in different ways. Their reasoning can be based on a structure as simple as placing frames of video on a grid pattern, or as complex as blocking the frames on the screen (as stage actors are blocked in the theater) based on the story, character motivation, character background, etc.

The simple structures chosen for Agent Stories are based on what type of clips are in the list of chosen clips to play, called the *playlist*. Main character clips in the playlist will appear in the middle of the screen. Minor character and dramatization clips in the playlist will appear around the outside of the main character clips. Main character clips stay on the screen in place until the next main character clip takes its place. This will be true even if there is time between the end of one main character clip, and the start of another. In such a case, the previous clip remains frozen on the last frame until the next clip starts. Experimentation with screen placement styles is ongoing.

4.6 Agent Behavior and Logic Scripting

4.6.1 The Agent Scripting Environment

The Agent Scripting Environment offers the writer a chance to define the logic behind the styles of story construction used by the story agents. While metalinear writers will have access to the ready-made story agents described in section 4.4.1, the Agent Scripting environment allows users to choose how a story agent reasons when trying to fill a story framework; that is, create the primary, secondary, and tertiary actions of each behavior of the story agent. What this means for a writer is that while she is not directly specifying which part of a story will follow another, she does have broad control over what ways the story domain will be constructed into a linear form. While she must relinquish a certain amount of authorial control, she also maintains some of that control over the construction process in this new way.

This has significance for the creative process, in that when the writer receives feedback from the WFE, she has the option of changing the story structure (Structural Environment), changing the story representation (Representational Environment), or changing the construction behaviors of one or more agents in the Agent Scripting Environment. Therefore, metalinear writing will have clearly identified controls, and one measure of a writer's craftsmanship will be how well they understand which of the three control variables to manipulate.

A story agent behavior is a set of rules which describe how the agent will perform in particular situations. Since the goal of each agent is to fill or solve the author's structural framework by choosing appropriate story clips, a situation for a story agent is each narrative primitive the story framework. Story agents walk down the framework from top to bottom, from one narrative primitive situation to another, choosing and inserting story clips as they go. Story agents, therefore, are similar to Pattie Maes' definition of a situated agent in the sense that story agents are aware of where they are and what their overall goal is. (Maes, 1990) (Maes, 1994) The story agent's rules match a situation or context with some primary action. If the primary action fails for some reason, a secondary action is called into play. If the secondary action fails, a tertiary action is triggered, if one exists. and so on.

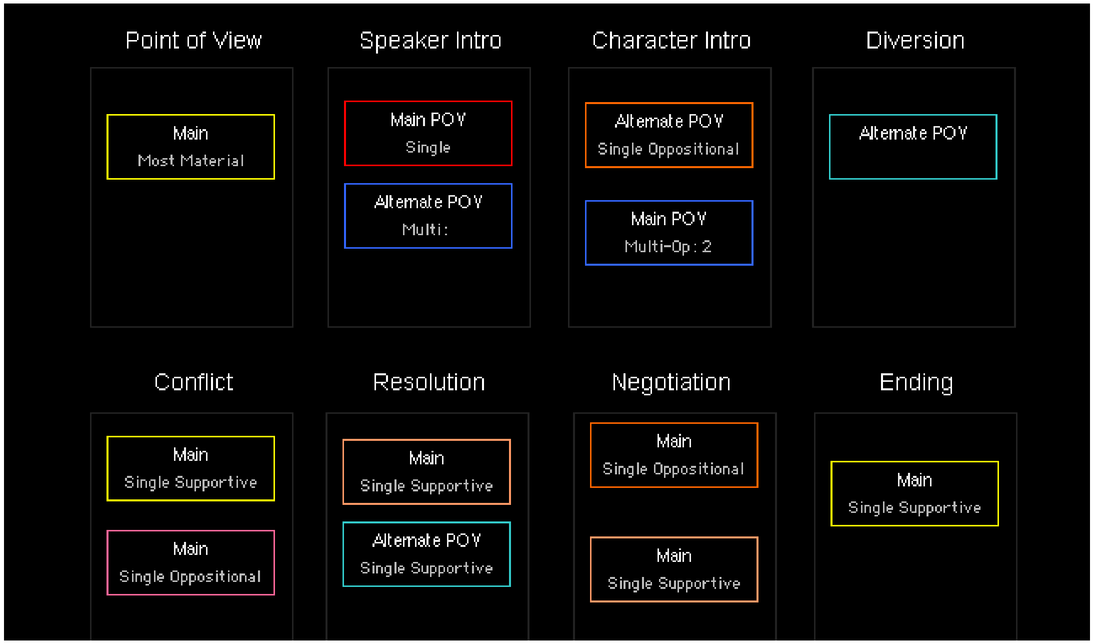


Fig. 31 The Agent Scripting Environment. Each colored behavior box represents a method for choosing a clip for the primitive type box it belongs to.

4.6.2 The Agent Scripting Language

The agent scripting language is a simple set of narrative descriptors which, when arranged appropriately, describe a way of filtering through the story domain, such that an agent can pick an appropriate clip or clips, if one exists. One of the goals of this environment was to make it easy: easy to understand and easy to use. The ease of use is required because the user would usually be someone who does not have computer programming experience. If the user did have programming experience, they would not necessarily care to apply that skill to the act of writing fiction.

There are eight story agent behaviors which correspond with the seven narrative primitives in the Structural Environment, plus one. The extra behavior is the Main point of view (POV) behavior. It controls which story character the agent will choose as its Main POV. Each agent first chooses a Main POV character among the various characters in the representational environment. The Main POV character forms the basis for other choices the agent must make later in the narrative construction process. Does the agent choose a character with a lot of oppositional links among its story elements? Or instead does the agent choose one with a lot of supportive links? These are not mutually exclusive. Does the agent choose a character with the greatest number of over all links to other story events? Choosing a POV is just one situation handled by an agent behavior. Other situations arise when the agent must choose a story element according to any of the seven narrative primitives of the structural environment.

What follows in this section is a description of the eight agent scripting environment behaviors, and their associated narrative descriptors. The descriptions of each behavior section are indented to show the levels of choice. For example, in Main POV, the Main, Minor, Dramatic and Sound are all first level choices. Each of these choices have second level choices, as listed in an indented fashion below them. Sometimes second level choices have third level choices which are shown indented further. In Main POV, choices like Specific are on the same level as Main, Minor, etc. However, since Specific has a different second level choice, it is on a line by itself.

```
Main POV:
    Main, Minor, Dramatic, Sound
        Most Material, Least Material, Most Oppositional,
        Least Oppositional, Most Supportive, Least Supportive,
        Random
    Specific
        Character Name____
```

The choices of Most Material through Random are different ways of classifying the story's characters. Most and Least Material refer to the number of clips belonging to a character. Most and Least Oppositional refers to the number of oppositional links between the clips of each character. Most and Least Supportive work in a similar way except with supportive links. Random simply means that the story agent will make a random choice in order to find the main POV among the story domain's main characters. The Specific choice allows a writer/story agent designer to make an agent specifically for their story domain, by specifying the name of the character to choose.

```
Speaker Intro
    Main POV, Alternative
        Single
        Multiple
            How Many?___
    Specific
        Character Name_____
```

For Speaker Intro, the first level choices of Main POV and Alternative have only the sub choices of Single and Multiple for the writer to specify how many clips from the main point of view should be shown. Alternative refers to something alternative from the Main POV, as chosen in the previous behavior section. For instance, if there are three characters, Joey, Patrick and the Woman, and Joey was chosen as the Main POV and the Speaker Intro was the first element in the story framework, it would be significant to have Patrick start the story with his own detailed Speaker Intro. The rest of this version of the story could be mainly about Joey and his construction trials and tribulations, but the beginning would be about one young kid talking about how he's trying to make a living for the first time in his life. We are given the world through one set of eyes, then offered another, older set of eyes through much of the main story as a contrast. This is just one example of how choosing an alternate POV can make a meaningful difference in the final story

The Speaker Intro does not make use of Supportive or Opposition links, because it makes little sense to refer to a story clip as being in opposition to something, when the clip is someone's first person opinion of themselves. How can Patrick's opinion about himself be in opposition to something else – what would someone else's opinion matter to Patrick and what would such an opposition mean?[23]

The words Single and Multiple in the agent scripting language refer to clips, not characters. That is, the writer/story agent designer has an option of playing a single clip or multiple clips. The clips could belong to the same character or different characters. For Multiple, the story agents try to satisfy the How Many number by choosing either that number or less of which ever type of clip is being requested.

[23] These are culturally relevant questions, having to do with how narrative content and structure reflect a cultural identity. While much of this topic is beyond the scope of my research, it is touched on further in chapter 5.

Character Intro
- Main POV, Alternative
  - Single Oppositional, Single Supportive
  - Multiple Oppositional, Multiple Supportive
    - How Many?____
  - Specific
    - Character Name_____

The Character Intro's Main and Alternative first level choices each have four second level choices: Single Oppositional, Single Supportive, Multiple Oppositional and Multiple Supportive. In contrast to the Speaker Intro, the Character Intro does make use of oppositional and supportive links because Character Intros deal with details in the world outside of who the speaker is. Through a Character Intro we understand the character by understanding how they see their world. Each set of world details for individual characters could be, and probably are different, and some could be in direct opposition to others: "The room was jam packed crowded with people – no one could move," "I saw no one in the room but her," "It was a typical frat party, ya know – 2 kegs, 4 guys to ever girl, not enough food."

Conflict
- Main POV, Alternative
  - Single Oppositional, Single Supportive
  - Multiple Oppositional, Multiple Supportive
    - How Many?____

Conflict, Resolution and Negotiation all have the same choices. These were designed to be simple choices so that a writer could more easily understand how they were used and thereby somewhat predict the outcome. While providing more descriptive power by providing more options and submenus is certainly possible here, I made the choice for power through simplicity instead of power through complexity. Power here refers to the writer's agility with the tool. The less complex the tool, the easier it is for the writer to acquire it conceptually and use it creatively. Some of these issues will be address further in the chapter on system evaluation, Chapter 5.

- Resolution
  - Main POV, Alternative
    - Single Oppositional, Single Supportive
    - Multiple Oppositional, Multiple Supportive
      - How Many?____

- Negotiation
  - Main POV, Alternative
    - Single Oppositional, Single Supportive
    - Multiple Oppositional, Multiple Supportive
      - How Many?____

- Diversion
  - Main POV, Alternative

Over the course of this research, the Diversion primitive and agent behavior initially held great complexity. At one time Diversion stood for the possibility of a story within a story, a great inward spiraling effect of story structure and story representation where another whole story structure could be encapsulated within a Diversion. Over the years, I have come to believe more and more that power of the system is directly proportional to the power of the human using the system – which to some extent corresponds to the ability of the system to get out of the way of the user. In following this belief, I have pared away Diversion to just the above two simple choices, with the hopes that interesting complexity comes not from mechanical/computational form of representation, but from a more fluid representation in the form of good writing.

Ending
    Main POV, Alternative
        Single Oppositional, Single Supportive
    Specific
        Character Name_____

To create a story agent, the writer drags the Behavior box up from the bottom of the screen and releases it in one of the behavior set boxes. Each Behavior box is separated by a Boolean operator, either implicitly or explicitly. By dragging the Boolean AND operator up from the bottom of the screen and placing it in between two behaviors, the writer is telling the system to satisfy both conditions, if not with a single clip, then with multiple clips. For instance, if in the Conflict behavior set box there was a Main POV–Single Oppositional AND Alternative POV–Single Oppositional, then first we would see a conflict from the Main POV character and then a conflict from a character who disagrees with the Main POV character's view of the conflict. However, if the behavior set box held Main POV–Single Oppositional followed directly by Alternative POV–Single Oppositional, without the AND operator, then there is an implicit Boolean OR between the two behaviors, thus the story agent will choose whichever behavior it can successfully satisfy first.

Ted is a point-counter point story agent. Ted's first choice for Main POV is Most Oppositional because he constructs argumentative stories. This behavior cannot fail, because there will always be one character who is most oppositional. If there is a tie between two or more characters for having the highest oppositional links, then the system picks one character at random. However, just to be safe, Ted's next choice is to choose the character who has the most material; again, a determination which can not fail – unless there are no clips in the story domain at all.

Ted's Speaker Intro is Main POV–Single because it makes sense to have the most argumentative character say something here. Then Ted, in order to be fair, will include multiple opposing views in his Character Intros. The same is true for his Conflicts and Resolutions. Diversions, while not oppositional, can be from multiple points of view. Ted's Diversion behavior simply requests two clips, one from the Main POV and one not from the Main POV. Ted's ending is in keeping with his pattern of fairness, with oppositional clips from a main and then alternative POV. Ted does not handle Negotiation well. Ted is argumentative, and negotiation (in general) does not necessarily support his argumentative nature. However, since a story agent must be able to do something in all its behavior set boxes, by not including any behaviors in Negotiation, Ted falls back to the system's default behavior, which is to choose a single random Main POV clip for that clip type.

The flexibility of both writer and agents allows for a great range of possible linear narratives. The functionality of Agent Stories depends only on its relative simplicity and the writer's imagination.