

Decentering the Dancing Text: From Dance Intertext to Hypertext

Timothy Miles-Board
Intelligence, Agents,
Multimedia Group
University of Southampton
Southampton, UK
tmb@ecs.soton.ac.uk

Deveril
Department of Dance Studies
University of Surrey
Guildford, UK
deveril@surrey.ac.uk

Janet Lansdale
Department of Dance Studies
University of Surrey
Guildford, UK
J.Lansdale@surrey.ac.uk

Leslie Carr
Intelligence, Agents,
Multimedia Group
University of Southampton
Southampton, UK
lac@ecs.soton.ac.uk

Wendy Hall
Intelligence, Agents,
Multimedia Group
University of Southampton
Southampton, UK
wh@ecs.soton.ac.uk

ABSTRACT

This paper explains and draws together two projects from different disciplines: dance studies and hypertext writing. Each project sets out to examine the processes and practices of hypertextuality, and to develop new ways of writing using electronic technology and the Internet. The dance studies project seeks to link the critical theory of intertextuality (as a means of dance interpretation) with the theoretical and practical concerns of hypertextuality. It hopes to show a convergence of the two into a working system for analysing dance in a network of people, institutions and information. The Associative Writing Framework (AWF) project seeks to explore how writers could best be supported in representing and exploring hypertextuality in a Web environment, and in producing new hypertexts which integrate or “glue together” existing Web resources (ideas, concepts, data, descriptions, experiences, claims, theories, suggestions, reports, *etc.*). Following the combining of the two projects we report on some initial evaluation of the AWF system by dance experts, and discuss where the relationship might lead and potential future outcomes of the collaboration.

Categories and Subject Descriptors

J.5 [ARTS AND HUMANITIES]: Performing Arts; H.5.4 [INFORMATION INTERFACES AND PRESENTATION]: Hypertext/Hypermedia

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General Terms

Theory, Human Factors, Experimentation

Keywords

Dance Analysis, Intertextuality, Hypertextuality

1. INTRODUCTION

The terms *hypertextual* and *intertextual* are used to describe the ways in which culturally-produced items and works (including written texts, paintings, photographs, films, and aural texts) relate and connect to other cultural ‘objects’. The relationships between many cultural objects are often characterised by terms such as ‘genre’ or ‘style’, and these can form the basis for creation and subsequent analysis according to the conventions and defining qualities of a given style. When a work imitates the style or content of another work or genre, it can be said to reference or quote the previous example. This allows both the maker of the new work and the person analysing it the chance to play with what meanings can be derived from a knowledge of and familiarity with different genres and styles, and the ways and contexts in which they have been used in the past. Sometimes this relationship may take the form of pastiche or parody, destabilising the original form and creating a new, often socio-political and critical, set of meanings.

In *hypertextuality*, connections, or (hyper)links, can be considered to be the major factor in the defining of something as a hypertext. A reader can navigate their way around a series of connections made by the author of the hypertext. In the case of *intertextuality* [3], these connections can be born at the ‘production stage’ of a text or when it is ‘read’ by another person. The concept of intertextuality, to state it in simple terms, suggests that many works of art, or ‘texts’ as they are known (regardless of form), gain much of their meaning and relevance to people by virtue of these connections [4]. This complex interconnectedness is what can be described by constructing intertextual readings and interpretations of a particular text, drawing in other

texts as the interpreter sees fit. Intertextuality as an approach is not rigidly defined, and it can be viewed as a ‘way of seeing’ rather than as an authoritative system of analysis [30]. With an emphasis on open-ended interpretations, as opposed to closed, definitive readings, intertextuality also challenges the concept of a finished work of art. But this, in practice, is difficult to maintain when each interpretation must be presented in some ‘finished’ form. Intertextuality has been used to analyse literature, film, and music [4, 5, 11] and latterly, theatre and dance [2].

One reason why the intertextual approach may be appropriately represented in a hypertext model is tenuously supported by the claim of “some hypertext enthusiasts [...] that hypertext is the most natural way to organize human ideas because its semantic network-like structure matches the human brain” [29, p90]; interpreting intertextually allows for the tangential and various thoughts humans have when engaged in any activity. Svedjedal gives a broad definition that sees “hypertext as a certain structural form, possible to achieve in any medium, but nevertheless best realized when texts are digitized and available in computer networks” [33]. The terms used to describe the structure of hypertexts are often borrowed from literary criticism discourses, yet hypertext is seen most regularly as, in a way, the opposite to traditional literary works. If traditional works are defined as linear or monosequential, then hypertexts “may be called non-linear, multilinear, multisequential, or multicursal” [33]; they invite and require an active reader, interaction and decision making. They may allow for the hypertext user to be able to create a new path each time. A number of writers make connections between the principles of hypertext and what Aarseth calls “ergodic literature” and “cybertext” [1]. In Aarseth’s picture of cybertexts, hypertext is a type of digital ergodic text, with a (mostly) distinctive set of characteristics, born out of the original conceptualisations of the form. The number of literary and critical hypertexts is growing. See, for example, Cayley’s *Hypertext/Cybertext/Poetext* [9] and Memmott’s *Lexia to Perplexia* [23]. The Web has also already been used to analyse such texts as a key section of the film *Singin’ in the Rain* [24]. In this hypertext the analysts incorporate streamed video clips of the piece into what they describe as “not so much an essay as a text in the deepest sense: a fabric of ideas deeply and multiply connected”; a collection of linked theoretical and interpretive nodes.

It must be stressed that these constructs continue to shift and develop to consider new approaches and practices in cultural and theoretical landscapes, particularly the notion of intertextuality. It can be appropriated and adapted for a number of analytical needs and biases, therefore, added to their unstable theoretical basis are the various schools of thought from structuralist and poststructuralist analysis to Marxist, feminist and psychoanalytic theories.

The project ‘Decentering the Dancing Text’, based at the University of Surrey, is an investigation of how it might be possible to use a hypertext system to record the intertextualities that an interpreter discovers in a dance piece, beginning from the analysis of the piece, through the development of a web of interconnected references, reminiscences, related texts and readers’ notes. Restated, a primary aim of this project is to develop a hypertextual model for the intertextual analysis of digitised dance video¹. The proposal rests

on the notion that any analysis of a dance piece is an ongoing and open process. It produces a continuously evolving set of interpretations and ‘meanings’, which do not exist in a strictly linear relationship to one another, but can be seen as forming a hermeneutic network.

The term ‘decentering’ is used because of its polysemous relationship to a number of disciplines and approaches, notably (post)structuralist analysis and intertextuality, hypertext theory, literary theories of the subject and author and certain psychoanalytical conceptualisations of the self. For example [20] aligns the way in which hypertext allows us to navigate our own paths through it, thereby destabilising the concepts of reader and writer, with the Derridean suggestion that we live in a decentred world in which norms are replaced by relativity. The processes of hypertextuality and decentering can be seen to be connected to Barthes’s notion of the text and intertextuality. ‘Decentering’ also has a connection to the dance performances of well-known choreographers such as Merce Cunningham, who removed the actual and metaphorical centre of the dance, for example, by allowing the audience to choose their own focus on the dance through presenting a number of actions on stage.

The processes of watching and analysing a dance piece are complex and require a number of skills in order to make ‘sense’ (in personal and inter-personal ways) of the work, and the related experiences: the creating, the dancing, the watching, the interpreting, etc. The background training and socio-cultural experiences of a person will direct their interpretations of a dance piece, as they will affect any cultural experience. Their ‘tastes’ and preferences for particular forms of dance are shaped by these experiences, and, as a combination, are unique to every person. The ways in which these experiences play off each other when watching something like a dance piece form the basis for an interpretation, which takes form when it is expressed as language, verbal (including ‘thought’) or written. There are a range of things that can be considered as valid responses to a dance piece: other dance pieces and selected movements or gestures, pictures, sounds — many of which cannot be adequately described in words and necessitate the actual experience of ‘experiencing’ them.

The purpose of this paper is to describe our search for a hypertext system well-suited to recording and linking the intertexts that may be discovered and made apparent in the process of analysing of a dance piece.

2. CURRENT PROCESS

A human interpreter, whom we shall refer to as the *meaning maker*, watches a (streamed digital) video of a dance piece. At certain points throughout the piece they may be reminded of another ‘work’ (or some artifact from their life or past experience), or simply follow directions of enquiry as they respond to the performance (for example, the response *why has the writer chosen to use the name Carla for the main character?* may lead to the meaning maker searching the Web for the origins and definition of the name to form the basis of further interpretation). From these initial levels of descriptive analysis and ‘first impressions’ (or primary interpretations), the network of interpretation is expanded by

to refer mostly to a digitised video version of a ‘live performance’, or a performance that was created specifically for the screen.

¹In this paper the words ‘dance’ or ‘dance piece’ are used

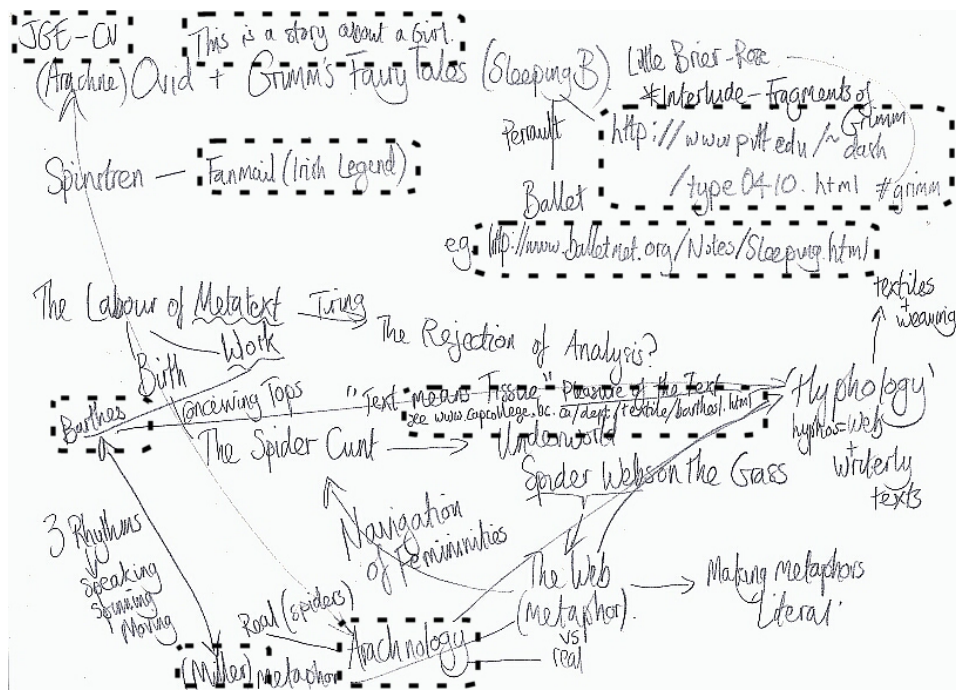


Figure 1: Mapping intertextualities of dance performance 'Spinstren'.

the meaning maker to include any number of subsequent references and links as intertextually connected works move in and out of the meaning maker's focus of analysis, effectively 'decentering' the dance piece.

A brief informal survey of dance researchers at the University of Surrey revealed that the most common process for meaning makers to represent their intertextual interpretations of a dance performance was to construct a 'map'. Figure 1 shows one of a series of maps created in response to the dance piece 'Spinstren'². This example is particularly interesting as it includes a number of hypertextual devices (highlighted) in the interpretation network, such as references to the performance (verbatim transcribing of narrative — "This is a story about a girl") and intertextual references by name ('Arachnology', 'Fanmail'), author ('Barthes', 'Miller'), URL, and personal encodings ('JGE-CV' refers to the CV of Jools Gilson-Ellis, the choreographer). Where the dance piece being interpreted has no narrative to which the meaning maker can refer directly, the map may include fragments of movement notation referring to specific parts of the performance (figure 2). This map then forms the basis of an academic work presenting the meaning maker's interpretation of the piece, such as a linear essay/paper or non-linear (Web-based) hypertext.

The 'map method', somewhat ad-libbed and anarchic, based on the good old fashioned technique of writing by

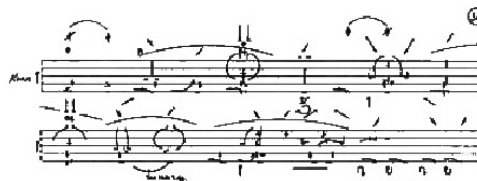


Figure 2: Benesh notation [26] for referring to specific movements in dance performance.

hand using pencil and paper, develops organically as the meaning maker is struck by points in a text worthy of note and endeavours to make the relationships apparent between them. It has the obvious advantage of being a quick and easy way to record an overview of the hypertextual structure of the interpretation. However, the map quickly becomes unmanageable and messy. Furthermore, the amount of information that can be included is limited to the most basic of notes (which in fact helps provide an 'overview' of the intertextual connections, but does not aid the meaning maker in transforming the map into a presentation of the interpretation — texts have to be revisited to recall exactly what part was being referred to in the map). A map also makes combining or comparing interpretations with other meaning makers difficult.

In an attempt to devise a more structured approach for capturing intertextual interpretations of a dance piece, researchers at the University of Surrey evolved a different mapping approach in which related texts are compared side-by-side. Interestingly, although the researchers worked independently, both the examples in figures 3 and 4 use three columns to delineate the emerging interpretation (both examples are extracts from interpretations of 'Spinstren') using a word-processing tool. In figure 3, the meaning maker

²<http://www.auneheadarts.org.uk/halfangel/spinstren/index.html>. Spinstren spins together the story of Carla (a girl who steals a spinning top), with the story of *The Spinstren* (a breed of magical women), combining spinning stories such as *Sleeping Beauty* and that of the contest between the mythical characters Athena and Arachne. The Spinstren are themselves strangely quasi-mythical/fictional, because the choreographer Jools Gilson-Ellis created them for this piece.

'Geometries' (Actual words said)	Notes	Extra Notes
	A rectangle of light on the floor comes up on two figures, dressed in pale, loose two-piece outfits, one at each side of the performance space. The figures on the right begins to talk, as the figures on the left moves. From stood upright with crossed arms, facing front, to a sideways down-facing posture. Arms pointing to the floor, buttocks pointing into the space, left heel raised, beginning an upwards movement of the hands, that takes the upper body back down so that the hands can trace a pattern of parallel lines and curves and reaches. The left leg steps back into the space, starting a traveling sequence that takes the feet into a stationary 'parallel' position. The arms begins, as threads around the body (the spinning top), and they get fed through the mechanisms of the spinning wheel and loom.	What processes do we apply when we 'read a dance piece'? Are they the same as when we read a text made of words? Do the other elements of the dance give us 'more' than the movements? The costumes, the sounds, the extra-context?
Carla studies geometries but she should be reading Byron.	Carla The name of the main character intrigues me. I am always curious how writers choose names. Carla. Its origins suggest masculinity. Carla: One who is strong, Anglo-Saxon Feminine of Charles, derived from Germanic word for "free man", (introduced to Britain by Mary Queen of Scots or from the Latin name Carolus or possibly the Old English ceorl "man"). Carla is ranked alongside the famous female weavers and spinners of fiction and history (http://trace.rtu.ac.uk/www/webwarpwef/women.htm) The metaphor of weaving has become popular for the structure of the web, e.g. Berners-Lee, T. and Fischett, M. (1996) <i>Weaving the Web: The Past, Present and Future of the World Wide Web by its Inventor</i> . London: Orion Business Books, and http://www.capcollege.bc.ca/dwep0206/index.html	When I watch a piece of dance, on stage or on screen, I have not much time to form a satisfactorily 'analytical' response. But what response(s) do I have to offer?
Carla studies geometries when she should be	Geometry The movement of the two solos shifts from the describing of curves, to the drawing of straight lines with the arms and legs, retaining a circular movement in the hips. In the second solo, momentum from the limbs carries the dancer into spirals on the spot. I. a. The science which investigates the properties and relations of magnitudes in space, as lines, surfaces, and solids. In early quotes, geometry is chiefly regarded as a practical art of measuring and planning, and is mainly associated with architecture.	I can describe what I have seen in a number of ways: as a dancer or as a choreographer or as a writer of dance. I can adjust my vocabulary to suit the listener and the context.

Figure 3: 3-column representation (Deveril).

REFLECTIONS ON A WEB: an essay on etymology and cultural associations of web, weaving and spinning. To manufacture in a loom by crossing the threads of yarns (1) called the warp and the weft (OED) – a loom of course is finite, it has structural constraints of size and shape and the eventual fabric is determined by them. To form a texture with threads (2): to interlace or intertwine so as to form a fabric (OED, 1538). This similarly insists upon a final form, a fabric used in clothing or furnishing, which can be held in time. This fabric is no longer subject to change.	QUESTIONS OF LINKING LOGIC: the nature of the intertextual strategy linking column 1 to column 3 - From critical literature on intertextuality; cited in Adsheed-Lansdale 1989 Chapter 1 (1) The question of interest here is how the structural constraints of intertextual and hypertextual systems are created and by whom, in what interest. Or is it/their/their of such constraints? (2) Interlacing is a useful analogy which shows the fluidity of thinking but also the interconnectedness of the traces or ideas in an intertextual process.	SPINSTREN CONNECTIONS: references to clips from <i>Halfangel</i> (Lois Gilsen Ellis, 2003) Titles within the work, as given in Jools' text, are used to identify sections and bold letters A refer to clips to be inserted. (1) <i>Spinstren's</i> constraints are epitomised in the section <i>Geometries</i> where two potentially conflicting ideas are explicitly presented in words, the first in the attraction of the formality of geometry and the second in the movement of poetry. Jools seeks 'the longing of a fraction' and 'the heat of poetry in a straight line'. Clip A (2) In <i>Spider Mouth</i> the precise and formalised shaping of bodies provides a series of images of clarity. There union movement of the two dancers is itself a repetition while within the movement there are also symmetrical bodily forms. Clip B the section starts with each dancer distinct but they cross and intertwine. The carefully placed bodies and the shaping of the arts in a held extended position is succeeded by a series of crossing over movements. First the right leg is crossed very slowly over the left leg in a diagonal forward movement as the torso bends forward. Countertension makes the action more complex as the left leg repeats the movement of the right in the opposite direction, serving to close the body in on itself, arms and legs crossed over the body. This counter point is echoed in the fragmented vocal phrases and the music. Further links to the cross; spokes of a wheel; containment in a psychological sense as well as a physical sense.
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Figure 4: 3-column representation (Janet Lansdale).

uses the first column to show references into the dance piece (by transcribing the actual words said in the performance). The middle column records the meaning maker's primary responses to the piece, including descriptions of movement in the dance, and intertextual connections to other texts. The third column records potential avenues of further exploration (each of which may in turn necessitate a new 3-column layout). In figure 4, the meaning maker takes a slightly different approach to recording her interpretations. The third column ("Spinstren connections") records primary responses to the piece; column 1 records intertextual connections with other works; the middle column attempts to further interpret the nature of the intertextual connection between the outer columns. This method makes the combining or comparison of interpretations much easier (and the 'unlimited' supply of electronic pages means more detailed interpretations can be recorded), but it lacks the expressiveness of the map approach - (inter)texts which transcend the physical boundaries of the columns cannot easily be represented.

2.1 Practical Requirements for a Dance Hypertext System

Given the limitations of the current methods for recording intertextual interpretations of a dance performance, this section presents (from the perspective of dance researchers) a broad list of requirements for a hypothetical 'dance hy-

pertext system' to support this activity, in order to focus a critical review of existing hypertext systems.

1. Facilitate hypertext representation of current dance analysis process

To best support the dance analysis activity, a hypertext system should facilitate the user in a number of tasks in the pursuit of realising their own ideas and constructing a navigable network stemming from their interpretive work on a specific dance piece. More specifically, the meaning maker should be able to 'tag' the video (or other performance medium, including images and text) at specific points with links to the first level of interpretation (or responses), removing the need to transcribe the narrative of the piece or use dance notation to indicate specific movements — an important advantage at this stage where quick and easy recording of responses is important (cf. ease of expression using pencil and paper map). References to narrative and movement used in figures 1, 3, and 4 would therefore be replaced with a hypertext link connecting the response to a specific portion of video. The meaning maker should also be able to indicate directly the relevant portions of related (intertextual) works, whether text (cf. copying and pasting of text from other sources into 3-column diagram), image, sound, or video, and be able to easily shift the focus of analysis to these works before returning to continue analysis of the dance performance. The ability to add semantic information to responses, existing materials, and intertextual connections may also be useful in recording the intentions and purposes of the meaning maker (see section 2.1.1).

2. Network overview facilities

The hypertext system should act as both a recording device and a navigation tool, noting the series of steps taken by the meaning maker in constructing the interpretation. This will allow the meaning maker to get an overview of the emerging interpretation (analogous to, but more powerful than the current map approach outlined above), and quickly revisit previous responses (perhaps to add further connections). An overview map also helps to remove the metaphorical central positioning of the original dance piece in the network as the number of intertextual connections grows. As the network begins to incorporate other online dance pieces and works of art, and therefore provide an increasing number of entry points, an overview map becomes vital. The inclusion of *filtering*, *indexing*, and *searching facilities* would also be beneficial, particularly semantic and linguistic searches, and automatic theme extraction.

3. Open access to dance hypertext

Once a meaning maker starts work on an interpretive network, the network should be openly accessible to other users (other meaning makers, readers). When users view the dance piece (and other works), the meaning maker's interpretations and responses are visibly 'tagged' to relevant portions of the work (video frames, image regions, text spans), and intertextual links can be followed to reach other works. Every user

should be able to add their own responses to the interconnected texts (including being able to respond to interpretations of other meaning makers). Each interpretive response and connection should be personally tagged with the user’s identity and context to help others understand the authority and perspective of the interpretations. This facility is a natural extension of attempts with the 3-column method to improve the possibilities of combining and comparing interpretations. The inclusion of semantic information in the network becomes particularly important in the light of this desired feature. Semantics help to understand the often personal, sometimes tacit, interpretations of others; overview maps help users orient themselves in the polyvocal network and identify promising entry points.

4. Support for writing

The hypertext system should aid meaning makers in transforming interpretive structures into a presentation suitable for dissemination. For example, a Web-based hypertext with intertextual connections presented as links, or a linear essay (formatted to any one of a number of conventions for dissemination and publication) with citations to intertexts.

5. Integration with the existing Web environment

The hypertext system should be grounded in the Web environment, to complement the current practice of watching streamed digital videos through a Web browser and searching, exploring, and reading within the Web environment. Dance researchers at the University of Surrey typically do not have experience of computing environments outside of everyday activities such as using the Web, email, and word processing. It is therefore necessary that the hypertext system be user-friendly and intuitive, and be based on familiar interactions.

2.1.1 Semantics of Dance Analysis

After suggesting the possibility of allowing meaning makers (and other users in the dance hypertext) to add semantic information to their interpretations to help explicate their intentions and purposes (requirement 1), researchers at the University of Surrey began to explore the semantics inherent in the interpretation of a dance performance, primarily through comparison and discussion of the interpretations recorded using the 3-column method. The initial results of this investigation are presented in figure 5 as a set of 5 inter-linked categories (which themselves may be intertextual, for example, a comment made by a choreographer describing the work may also refer to dance and literary history). The intention is not to define a rigorous and complete taxonomy of possible types, but to begin to explore the kinds of semantics inherent in the analysis of a dance performance: the semantics of the work itself (A) emerge through the transformation of the work to text through description (B) and the personal responses of the meaning maker (C), which may then be connected to (descriptions/responses to) other works according to cultural (D) and theoretical (E) interpretations.

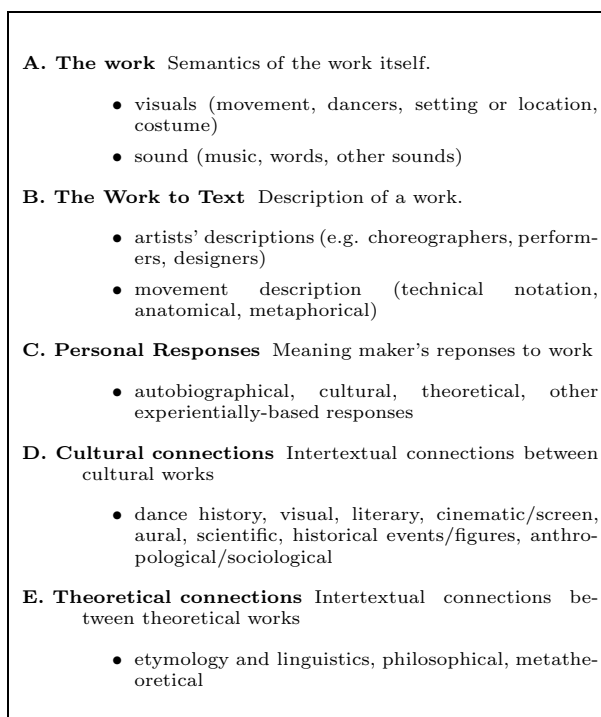


Figure 5: Initial analysis of the semantics of dance intertexts

3. SURVEY OF HYPERTEXT SYSTEMS

Table 1 summarises the potential support for dance analysis provided by a number of recent hypertext tools. The requirements listed in Section 2.1 have been summarised to form the dimensions of the table; this section provides a brief discussion of each system according to these dimensions.

3.1 Hypertext Representation

Does the hypertext system facilitate the meaning maker in constructing a hypertext network stemming from their interpretative work on a dance piece, through tagging relevant pieces of works, annotating works with descriptions, responses, and interpretations, and linking these responses into a network of intertextual connections?

The Web’s limited hypertext model [7, 34] does not allow meaning makers to tag or add links to existing works directly, but links to these works from documents ‘owned’ by the meaning maker can be created (although these are simple uni-directional, binary links). By augmenting the Web hypertext model through the services of an open hypermedia structure server, WebVise [14] overcomes these limitations to allow meaning makers to tag existing works, add annotations, and connect content using bi-directional, multi-headed (*n*-ary) links. Interpretations could also be gathered into ‘contexts’ (layers of related structure). The Web browser-based annotation tools Annotea [18] and Fluid Annotations [8] also utilise an external ‘structure service’ to facilitate annotation of otherwise read-only Web pages. In each case, the service is queried for structures or annotations whenever a new page is viewed in the Web browser, and any received structures are merged into the document.

Annotea and Fluid Annotations may also be able to capture intertextual links. The default templates for describing

	Hypertext representation			Network overview	Open access	Writing support	Web integration	Semantic typing
	<i>tag</i>	<i>annotate</i>	<i>link</i>					
Web	○	·	○	·	●	·	●	·
WebVise	●	●	●	·	●	·	●	●
Annotea	●	●	○	·	●	·	●	●
Fluid Annotations	●	●	○	·	●	·	●	○
Hunter Gatherer	●	·	○	·	○	●	●	·
Visual Knowledge Builder	○	·	●	●	○	○	○	●
Storyspace	·	·	●	●	○	○	○	●
Tinderbox	○	·	●	●	○	○	○	●
CREAM	○	·	○	○	●	○	●	●
ScholOnto	·	·	○	●	●	·	●	●

●	Strength
○	↑
·	Potential weakness

Table 1: Comparison of support for dance analysis provided by surveyed systems.

annotations in Annotea include a *related* attribute which may be the URI of a related annotation or other Web resource. Templates can also be specialised to specific applications, for example [19] demonstrates how Annotea can be extended to support “threaded annotation discussions” by adding *reply-to* and *root-of-thread* attributes. Using both Annotea and Fluid Annotations, the meaning maker can also create HTML links inside the body of the annotation. In both cases, however, links are limited by the Web’s hypertext model. Hunter-Gather [31], also a Web browser-based tool, allows meaning makers to tag works by ‘gathering’ relevant spans of its content into a collection — links between gathered content can be implied by gathering related content into the same collection.

The map-based tools Visual Knowledge Builder (VKB) [32], Storyspace [6], and Tinderbox³ provide a separate workspace for hypertext representation. VKB’s spatial workspace widens the conventional node-link model embodied by the Web by allowing users to use spatial proximity and visual clues (colour, shape, font, *etc.*) to implicitly represent connections between nodes. More explicit (*cross-space*) relationships can also be made between nodes that are placed far away from each other (although no visible ‘link’ connects them). Storyspace also provides opportunities for spatial clustering and node colouring, but with explicit links displayed as arrows between nodes. Tinderbox also allows both implicit and explicit links, and visual cues to capture interpretations. Both VKB and Tinderbox allow nodes in the workspace to refer to external works via Web URLs, although note that the specific parts of the works are not ‘tagged’, nor are links *into* the interpretation workspace visible from the works themselves.

The Semantic Web initiatives CREAM [16] and ScholOnto [21] also have potential in this area, in their shared aim to facilitate the capture of interconnected metadata for the Semantic Web. CREAM provides an annotation-based interface, using an *Ontology Browser* (loaded with an ontology describing the domain of interest) in parallel with a *Document Viewer* (Web browser). In a dance context, a meaning maker could tag a work by first defining it as an instance of a particular ontological concept (for example, a *Painting*), and

then dragging and dropping spans of content from the document into attribute ‘slots’ for that concept (for example, the *name* of the painting, and *date* it was painted). The work can also be related to other works, according to the allowable relationships defined by the ontology, by dragging instances in the Ontology Browser onto relation slots of the Painting instance (for example, selecting the *Van Gogh* instance of the *Painter* concept, and dragging it to the *painted_by* relation). Subsequently, whenever that work is displayed in the Document Viewer, the metadata is retrieved from a “knowledge service” and displayed in the Ontology Browser.

Using ScholOnto’s form based interface, meaning makers can create a (centralised) shared Semantic Web of *concepts* (succinct summaries of a work) and *claims* (how concepts intertextually relate to other works, which may support or contest existing claims made by other meaning makers). However, in the case of both ScholOnto and CREAM, where tagging and linking is strictly governed by an ontology, there are concerns that perhaps the formal nature of these ontologies may leave little room for the more organic interpretation of intertextual connections surrounding a dance performance.

3.2 Network Overview

Does the hypertext system provide a graphical overview of the interpretation network?

By virtue of their design, the workspace-based tools VKB, StorySpace, and Tinderbox naturally facilitate interactive graphical overviews of the meaning maker’s emerging interpretations. StorySpace and Tinderbox also provide a number of ‘outline’ views which abstract the (hierarchical) structure of nodes in the workspace as a chart or tree. VKB’s “navigable history” and “suggestion manager” are also worth noting here as useful additions to the meaning maker’s toolkit. The former allows the construction of the hypertext to be ‘rewound’ and ‘played’ much like a videotape; the latter suggests possible relationships between nodes, and helps to organise and maintain the consistency of the workspace. The ScholOnto server generates overview maps as part of its support for interpretation and analysis of the “claim space”, and CREAM’s Ontology Browser may also provide a (restricted) overview of the interpretation network. By contrast, the

³<http://eastgate.com/tinderbox/>

Web browser-based tools WebVise, Annotea, Fluid Annotations, and Hunter-Gatherer, do not provide such views.

3.3 Open Access

Is the hypertext open for other meaning makers to explore and contribute to?

One of the main advantages of the Web for distributing a meaning maker's interpretations is that it is a publication platform which is (generally) open to any user with a Web browser. Although WebVise, Annotea, Fluid Annotations, CREAM, and Scholonto provide the potential for creating richer interpretation structures, users must install a tool (client) which is able to communicate with the (open) services which manage these structures (for example, structures created in WebVise are available to other meaning makers using WebVise, or a tool which understands WebVise protocols and structures). Interpretations captured using VKB, StorySpace, Tinderbox, and Hunter Gatherer can also be shared with other meaning makers, by email or by publishing files on the Web (see below).

3.4 Writing Support

Does the hypertext system aid the meaning maker in transforming interpretive structures into a presentation suitable for dissemination?

StorySpace and Tinderbox provide facilities for meaning makers to 'export' interpretations as a set of Web pages (in the case of Tinderbox, page layout and design can be specified, and 'compound pages' built from the combined content of several nodes). Tinderbox (and also VKB) can also export the workspace as an XML document, which could form the basis of further editing in another application. However, since these tools do not support the direct 'tagging' of works, exported forms do not link directly to the parts (e.g. video frames, image regions, text spans) of those works under consideration. By way of contrast, Hunter-Gatherer's "Collection View" is an exported linear list of gathered content in which there is no copying of content, only referencing of *specific content addresses* (via XPointers).

CREAM's "authoring mode" [15] allows metadata from the Ontology Browser to be dragged into a new Web document — dropping instances, attributes, and relationships from the Ontology Browser into the document creates content and, where possible, hypertext links.

3.5 Web Integration

Is the hypertext system integrated with the Web?

Most of the approaches surveyed here are integrated directly with the Web. WebVise, Annotea, Fluid Annotations, Hunter-Gatherer and CREAM integrate directly with existing Web browsers, whilst interaction with ScholOnto typically takes place through a series of Web-based forms. The VKB, StorySpace, and Tinderbox workspaces, by contrast, are separate from the 'normal' Web interface, although some integration is provided through URL awareness and HTML export capabilities.

3.6 Semantic Typing

Does the hypertext system allow intertextual responses and interpretations to be semantically typed?

Although the Web itself does not provide a (widely implemented) mechanism for supporting link types, links in WebVise can be assigned types from a hierarchy constructed

by the meaning maker using a special editor [17]. Annotea's annotation type hierarchy could also be extended, by defining new (dance specific) types (possibly with custom attributes). Semantic types for Fluid Annotations may be implied through *presentation specifications* (PSpecs), which describe the visual style of the anchor and gloss (e.g. colour, font): through an agreed mapping between PSpec and meanings, a group of meaning makers can assign implicit semantic types to fluid annotations.

The visual 'languages' (e.g. colour, shape, placement) supported by VKB and Tinderbox may emerge or evolve as the user's understanding of a task (such as the analysis of a dance piece) evolves [22]. As interpretations become more concrete, nodes can be assigned more explicit types (for example, by using *prototype* nodes in Tinderbox). Explicit links in Tinderbox and StorySpace can be assigned an arbitrary text label to denote semantic type.

In CREAM and ScholOnto, allowable node and relationship types are defined by an underlying ontology. Whereas CREAM uses a *domain* ontology to model *what* is being discussed in a particular domain, ScholOnto models discourse and argumentation — *how* the domain is being discussed. However, concerns that it may be difficult to formalise the current understanding of dance semantics (which is by no means complete) have been raised.

3.7 Summary

From this survey, it was concluded that the requirements of the dance analysis task are broader than any *one* of the hypertext systems surveyed here. However, table 1 does highlight some interesting trends in the context of this task. Of the surveyed approaches, the Web browser-based tools (WebVise, Annotea, Fluid Annotations, Hunter-Gatherer) show strengths in the areas of tagging, annotating, open access, and Web integration, whereas the map-based tools (VKB, StorySpace, and Tinderbox) have strengths in linking and network overview facilities. The potential weaknesses of the Semantic Web approaches (CREAM, ScholOnto) in supporting the more organic interpretation of intertextual connections surrounding a dance performance are also apparent. However, a more detailed investigation of how these systems could be extended or perhaps used in conjunction with one another was pre-empted by the exciting possibilities offered a by a project underway at the University of Southampton; the Associative Writing Framework.

4. THE ASSOCIATIVE WRITING FRAMEWORK

In testing ideas about how writers could best be supported in representing and exploring hypertextuality in a Web environment, the Associative Writing Framework (AWF) project at the University of Southampton has reached similar conclusions about the various strengths and weaknesses of existing Web browser and map-based approaches in more general writing scenarios, and has produced a prototype system to demonstrate a new approach to hypertext writing which attempts to unify the strengths of both approaches.

The name of the project derives from its aim of helping writers produce new hypertexts which integrate or "glue together" existing Web resources (ideas, concepts, data, descriptions, experiences, claims, theories, suggestions, reports,

etc.) using associative links [10].⁴ The project is motivated by an earlier analysis of Web pages in the Internet Archive⁵, which suggested that little evidence of such “integrated writing” exists on the Web [25].

The AWF project came to the attention of dance researchers at the University of Surrey in October 2002, when a prototype of the system was presented at the *Decentering the Dancing Text Experts Seminar (DDTES)*.⁶ A collaboration between the authors of this paper was agreed, in order to evaluate AWF as a system for representing and exploring the intertextuality of dance performances, and to determine the suitability of the approach.

4.1 The AWF Approach

As the survey in section 3 highlighted, Web browser-based systems allow users to capture implicit hypertextualities whilst directly engaged with Web media; as interpretations and responses occur to the meaning maker whilst ‘experiencing’ works, so they can be immediately recorded. However, the potential weakness of such approaches is that an overview of the emerging network of interpretation often not available. A further weakness is that intertextually related works (which the meaning maker has connected using, for example, WebVise) may be visible in separate browser windows on the meaning maker’s desktop, but remain disconnected at the physical boundaries of each window.

The surveyed map-based approaches avoid these pitfalls by virtue of their workspace-based interactions. In these systems, related information is always ‘visibly’ connected, whether explicitly (Storyspace, Tinderbox) or implicitly through spatial proximity (VKB, StorySpace, Tinderbox). However, these systems suffer the potential weakness of ‘disconnecting’ the meaning-maker from the (Web-based) works under analysis; as a result the meaning maker must constantly shift their “forced divided attention” [31] between experiencing works in the Web and recording interpretations and intertextualities in the workspace. As table 1 also illustrates, support for ‘integrated’ writing is weak in both approaches (with the possible exception of Hunter-Gatherer’s “Collection View”, which could form the basis of a new hypertext).

The Associative Writing Framework attempts to combine the strengths of both approaches in a single, open, writing environment. It should be noted, however, that in the context of the AWF project, we do not wish to replace either type of system — indeed, the surveyed systems offer many features above and beyond those of AWF — the purpose of the AWF prototype is to explore the effects of ‘blurring’ the boundaries between Web browser-based and map-based systems. However, the current prototype (with all its limitations) seemed well-suited to meet the requirements of dance analysis (table 2), as the next section will demonstrate in more detail (note that although the AWF prototype was created with more general writing tasks in mind, the overview focuses on a specific dance analysis application).

4.2 Overview of AWF Components

⁴This terminology has (independently) been used elsewhere to describe similar processes; for example, the Associative Writing Toolkit [35].

⁵<http://www.archive.org/>

⁶Presentation available online at <http://www.ecs.soton.ac.uk/~tmb/awf/>



Figure 6: Tagging text using AWF’s Annotate component.

The Associative Writing Framework has been implemented as a toolkit of components which currently integrate with the Internet Explorer browser and the Microsoft Frontpage Web editor. User interaction with AWF takes place through three main components: Annotate, Relate, and AWF Server.

4.2.1 Annotate

Annotate allows meaning makers to tag relevant content in existing Web-based works, optionally adding interpretations/responses and assigning semantics (figure 6). Like WebVise and Fluid Annotations, AWF’s Annotate component integrates with the Internet Explorer browser; in this case by adding a new toolbar to the browser interface (visible in figure 8). The AWF project utilises and extends the annotation templates proposed by the Annotea project to represent annotations and links within the system, and hence provides similar opportunities for extending or customising the hierarchy of semantic types available to the meaning maker. Annotations created by a group of meaning makers are stored externally by a shared AWF Server (also based on Annotea).

4.2.2 Relate

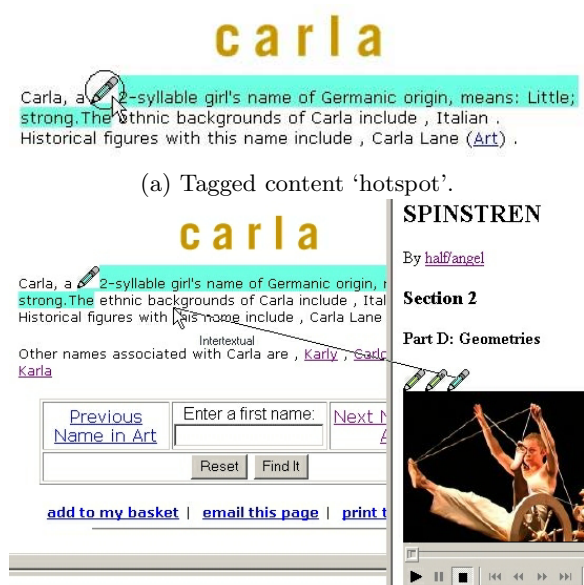
In an attempt to blur the boundaries between map-based and Web browser-based approaches, AWF’s Relate component allows the meaning maker to carry out map-like interactions in a Web browser-based context. Meaning makers can express intertextual relationships between tagged content *in situ* — without having to divide attention between ‘experience’ and representation — by ‘drawing’ connections directly onto the desktop⁷ (figure 7b), optionally specifying a semantic type for the relationship (note that many links can be created from a single tag — figure 8). Once recorded, these connections are displayed whenever the two endpoints are visible on the desktop, following the movement of windows and scrollbars, and thus keeping intertextually related works visibly and tangibly linked across the physical boundaries of Web browser windows (figure 7c, 8).

Such visible hypertext link connections are not an entirely new concept. Nelson advocated visible connections between documents for *side-by-side* comparison as early as 1972 [27] (for which he more recently coined the term “transpointing windows” [28]). Nelson states that transpointing windows address “the fundamental problem of hypertext: being able to see connections side by side,” whether the user is looking at separate pages, different versions of the same document, commentaries on one document by another, or any other parallel document structure⁸. Nelson’s CosmicBook Reader application demonstrated this concept in 2001⁹.

⁷Currently implemented only on the Microsoft Windows platform.

⁸<http://xanadu.com.au/ted/TN/PARALUNE/paraviz.html>

⁹<http://xanadu.com/cosmicbook/>



(a) Tagged content 'hotspot'.



(b) Drawing links between hotspots.



(c) Intertextually related works.

Figure 7: Using AWF's Relate component to capture intertextual relationships between works.

We should note at this point that AWF's use of "transpointing windows" as an attempt to bridge the advantages of map-based and Web browser-based approaches was not directly influenced by the CosmicBook project, but rather by a desire to extend the user interaction of existing Web browser-based hypertext tools such as WebVise, and earlier systems such as Microcosm [12], towards that of a map-based system such as StorySpace. For example, to capture an intertextual connection in WebVise, a meaning maker must highlight a source anchor (tag), choose the 'new link' action, highlight a target anchor, and finally choose the 'add anchor' action. By comparison, using StorySpace the meaning maker simply chooses an existing node (or span of node text), selects the 'link' action, and 'draws' a link to the target node. In AWF therefore, tags and intertextual links can also be created independently — as and when interpretations, responses, and intertextual links are uncovered in the experiencing of the works under consideration, so the meaning maker is able to record them directly.

It is hoped that the initial evaluation work presented here may be useful to other researchers interested in evaluating the "transpointing windows" approach, since the current AWF prototype demonstrates a number of features beyond

those of the current CosmicBook release, including open Web integration (rather than proprietary viewer and document format), full authoring capabilities (creation of tags and links 'on the fly'), and visible connection metadata (figure 7c).

4.2.3 AWF Server

As well as providing transparent storage and management facilities for structures created by the meaning maker, the AWF Server also generates customisable overview maps of the emerging network of interpretation¹⁰ — clicking on a tag opens an overview map showing the local interpretation network around that tag. At this stage, the overview map is interactive only in that clicking on a node of the map leads to the original tagged content in the original work. The aim of the overview map is to provide the meaning maker with a mechanism for revisiting and re-evaluating the interpretive structures they have created around the dance performance (and other intertextually related works), and for other meaning makers to explore this network in reference to the works. The map is filterable by creator (e.g. show only interpretations made by specified meaning makers or groups), creation date (e.g. show only recent interpretations), and URL (show only the hyperstructures surrounding a particular work). We eventually hope to replace this mechanism with a fully interactive map-based workspace, with tagged content and intertextual links created using AWF's Annotate and Relate components automatically appearing as nodes in the workspace, and changes to the interpretive structures made in the workspace reflected back to the Web browser-based visualisation (an approach under consideration involves leveraging Tinderbox's XML capabilities).

4.2.4 Integration with Microsoft Frontpage

AWF's integration with Microsoft Frontpage supports meaning makers in presenting and/or discussing their interpretations in the form of a new (Web-based) hypertext, which builds on (or integrates) the interpreted works themselves. Each 'tag' created with AWF's Annotate component has a context menu — by choosing the 'link' action from this menu, the meaning maker automatically inserts a direct link to the tagged position in the original work into the currently open Frontpage document. Overview maps generated by the AWF Server also have a context menu, allowing meaning makers to automatically insert a link to a specific structure in the interpretation network (which then leads the reader to the intertextually connected works underlying the structure). When the new hypertext is published on the Web, it therefore becomes visibly and tangibly integrated with existing works and may now be tagged and intertextually connected in AWF as part of the interpretations of other meaning makers.

5. INITIAL EVALUATION

In order to obtain some initial feedback as to the suitability of AWF as a hypertext system for supporting dance analysis, a short demonstration was put together which illustrated how AWF could be used to interpret a short clip of the dance piece 'Spinstren'. In order to facilitate this demonstration, a number of minor extensions to AWF needed to

¹⁰Currently achieved using the open graph visualisation toolkit *GraphViz* [13].

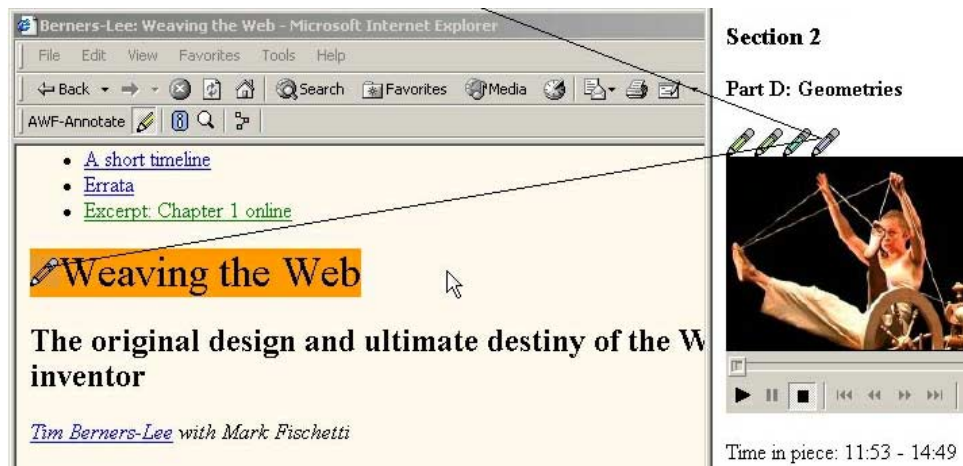


Figure 8: Capturing interpretations and intertextual connections on the desktop.

	Hypertext representation			Network overview	Open access	Writing support	Web integration	Semantic typing
	tag	annotate	link					
Associative Writing Framework	•	•	•	•	•	•	•	•

Table 2: Support for dance analysis provided by AWF.

be made, most importantly the extension of the Annotate component to allow users to tag specific segments of digital video (by interactively setting frame markers during playback) and images (by interactively selecting a region). The number of options given for defining the semantics of annotations and links were kept to a minimum for the purposes of the demonstration and evaluation (table 3).

A small number of dance experts (both students and researchers) were presented with a series of screen-capture videos of the AWF system being used to analyse the ‘Spinstren’ clip. These videos represented a mock-up of a scenario involving a dance researcher (Deveril) watching the streamed ‘Spinstren’ clip and responding to it by capturing interpretations and intertextual connections with other works, with the choreographer of ‘Spinstren’ (Jools Gilson-Ellis) and another researcher (Janet Lansdale) also contributing their perspectives on the piece and on Deveril’s interpretations. The videos were described and elaborated to small groups or individuals, who were free to ask questions and discuss what they were seeing at any time during the presentation. Each participant was presented with a questionnaire divided into two sections — the first section was filled out before the AWF demonstration, and the second section after the demonstration. The questions were designed to firstly gain insight into the participants’ prior knowledge and experience of intertextual analysis, and subsequently to gauge how they felt AWF might facilitate future work in such analyses.

The feedback on the questionnaires and from the experts in discussion with the authors was generally favourable towards AWF. Responses stated that the system seemed “much more useful than working on paper which doesn’t capture movement and image in the same way” and “easy to use for one with some Internet experience”. There was some concern that the system would require time to get to grips with, although the fact that AWF was based in familiar interac-

tions would mean that this process would be quicker than with a completely new application. To help with learning AWF it was generally thought that an on-screen demonstration and tutorial would be a good start, but that a live run-through of the procedures and hands-on experience would be the main ways of learning how to use the system.

The responses of the participants reflect the relative newness of this approach in dance analysis, although it is one which has a growing usage in scholarly appreciation of dance works. Intertextual method(s) of dance analysis have been pioneered by Janet Lansdale and others at the University of Surrey [2] at a mostly postgraduate level, but an awareness of it as an approach is spreading. The processes of the approach, as we have discussed, are at the same time ‘intuitive’ and difficult, particularly when it comes to expressing them. Even though some responses stated that the student hadn’t used intertextual analysis, it was apparent, on reflection and following discussion, that often students had worked ‘intertextually’ without realising that this was what they were doing. The available annotation and link types were felt to be adequate for continued work on the system, with an understanding that this may be amended and adapted as the system is used for the developing of intertextual and analytical networks on dance.

6. CONCLUSION

In summary, the Decentering the Dancing Text project set out to discover the potential for using hypertext to analyse dance according to principles of ‘intertextual interpretation’. The Associative Writing Framework, even in its prototypical form with a more general writing application proposed for it, seemed to the dance research team to satisfy a number of key considerations and incorporate some basic requirements of their hypothetical (theoretical) model, in particular the combination of relative strengths and weaknesses

Annotation types	Link types
<i>Description</i>	<i>Intertextual</i>
<i>Personal Response</i>	<i>Cultural</i>
<i>Theoretical Response</i>	<i>Theoretical</i>
<i>Cultural Response</i>	

Table 3: AWF semantics for dance analysis demonstration.

observed in other Web browser-based and map-based approaches. This paper has shown the contexts in which the two projects were conceived and the critical and practical overlaps of these contexts.

The importance of any system for intertextual dance analysis is that it allows for and demonstrates the open-endedness of dance pieces, in terms of meaning and interpretation. These two concepts are played with and explored practically as users of the system watch and respond to dance texts, and to the responses of others who may have used the system before. The dance pieces might already have been commented on by their makers (the choreographers, directors, performers, composers, etc.), giving contextual and background information on sources, references, intentions and after-thoughts on the piece and its creation. This is not to be considered the definitive reading of a piece, merely another layer of material which could be incorporated into an individual interpretation.

The Associative Writing Framework appears to provide, at the very least, an important testing ground for the intertextual analysis of dance in digital video form. It shows how a multitude of media and information types can be linked and made use of in a developing area of research. The previous problems presented by writing in an intertextual and hypertextual mode are shown to be reduced by AWF, and potentially allow for more work to be produced in this field.

Further to the initial testing presented here a working (stable and robust) system, based on AWF, should be presented to dance experts, students, and academics, to develop and appraise. As it will be presented on the World Wide Web, it will be accessible to anyone with an interest in it. It would be naive to imagine that this system would be utilised and wanted by everybody. There are clearly specific groups that would benefit from and have need of such a tool. These, however, are not limited to dance studies, but also areas such as drama and film studies — anything that has as its primary texts screen-based media. The individuals in these groups could be students, teachers, researchers, critics, writers of other sorts, and inquisitive audience members. It could also act as a tool for performers, choreographers, directors and designers, who wish to analyse or describe their own works in an intertextual manner, or who want to examine the work of others for links to their own work or between artists.

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