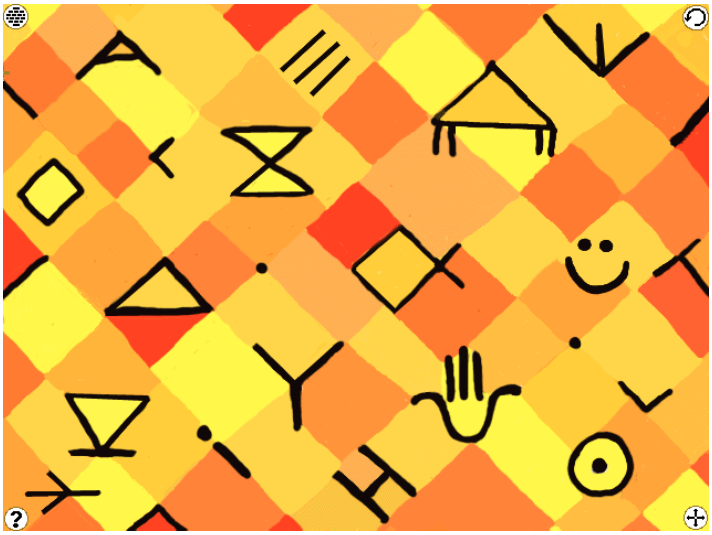
Extending Integrationist theory through the creation and analysis of a multimedia work of art: *Postcard From Tunis*

Sally Pryor



Extending Integrationist theory through the creation and analysis of a multimedia work of art: *Postcard From Tunis*

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Declaration

This work has not previously been submitted for a higher degree at any other institution. This thesis is the result of my own investigations, except where otherwise stated. Other sources are acknowledged in the text and a bibliography in alphabetical order of author's surname is appended. I hereby give consent for this thesis, if accepted, to be available for photocopying and microfilming.

Signed by Sally Elizabeth Pryor on 25 August 2003.

Abstract

This thesis consists of the production of an interactive computer-based artwork, an analysis of its research outcomes, and an exploration of the theoretical issues that influenced the artistic practice. The artwork, *Postcard From Tunis*, is an Integrationist exploration of writing and its transformation at the human–computer interface. It is set in a personal portrait of Tunis, a city with a rich history of writing.

The thesis starts with the theory of writing. The conventional view of real writing as representation of speech is shown to have serious limitations, which are addressed by Roy Harris's radical reconsideration of writing. This approach is based on the Integrationist theory of human communication as the contextualized integration of activities by means of signs.

Postcard From Tunis offers users who are not Arabic-literate the perception that there are actually no fixed boundaries between writing and pictures, as both are based on spatial configurations, and it suggests that the question of what is writing will differ from person to person (and moment to moment), depending on the macrosocial, biomechanical and circumstantial aspects of the activities integrated.

User interaction with *Postcard*, particularly rollover activity, creates a variety of dynamic signs that cannot be theorised by a bipartite theory of signs and that transcend a distinction between the verbal and the non-verbal altogether. These signs include kinetic and dynamically reflexive written signs that indicate in writing, but not in words, how the user is to read them.

Postcard both extends Integrationist theory into writing and human–computer interaction and also uniquely articulates this integration of activities in a way that is impossible with written words on paper.

The research asserts the validity of the Integrationist theory of writing, language and human communication and of uncoupling these from spoken words. A framework is outlined for future Integrationist research into icons and human–computer interaction.

Introduction

This piece of writing is an exegesis of my doctoral artwork, *Postcard From Tunis,* the result of my research and experimentation with writing and human–computer interaction.

In Chapter One, I outline the background and early stages of my research. I discuss my experience of the evolution of the human–computer interface and my interest in icons and alternative interfaces. I describe how a visit to Tunis changed my awareness of language, writing and visual symbols. I discuss my creation of a cross-cultural language learning prototype, *Xchange*, and why this led me to the seminal work of Roy Harris, Emeritus Professor of General Linguistics at the University of Oxford. I explain Harris's alternative view of the evolution of writing, which led me to focus on writing and human–computer interaction.

In Chapter Two I review the literature on the question *What is writing?* and discuss the foundations and limitations of the traditional view that real writing represents human speech. I outline Harris's more recent work on writing, which is based on the Integrationist theory of human communication, and show how this offers a powerful and alternative conception of writing that shifts the focus from representation to contextualized integration of activities.

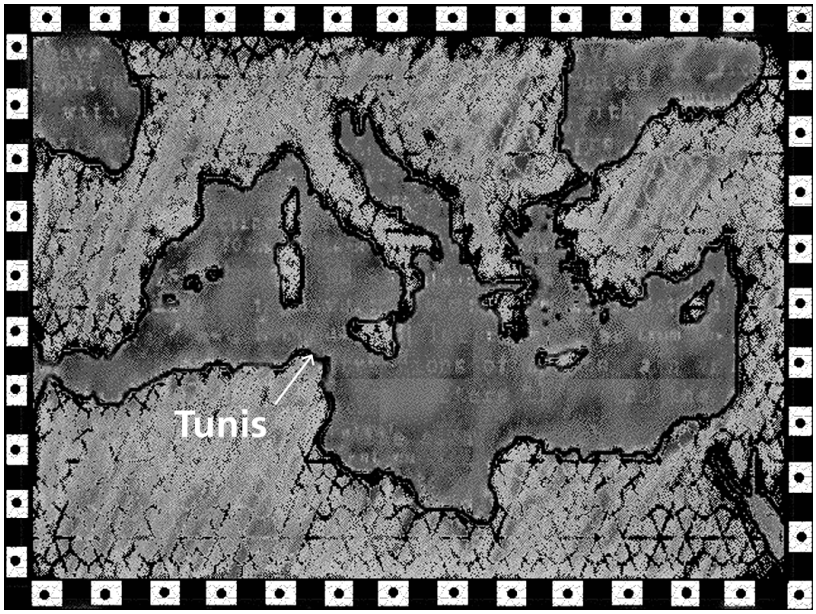
In Chapter Three, I outline the background of *Postcard From Tunis*, the result of my research and experimentation with writing and human–computer interaction. I discuss the metaphor of a postcard, the theoretical foundation of my artwork and its personal portrait of Tunis.

In Chapter Four, I discuss the main achievements of *Postcard From Tunis*. I detail the creation of a multidimensional communicational space, within which are new writing spaces and new kinds of signs, including new written signs. I discuss the artistic exploration of writing and the creation of *educational art.*

In Chapter Five I discuss how *Postcard From Tunis* contributes to the literature on writing and human–computer interaction. I discuss how *Postcard* articulates Integrationism and extends this theory into writing at the human–computer interface. I conclude with the icon and the human–computer interface and outline a foundation for further research in these areas.

In this thesis I frequently integrate visual images with the written text. This reflects an over-arching argument about the need to challenge a (verbalist) view that meaning is conveyed only by words and that pictures are merely decorative additions.

Chapter One
A new awareness of writing



This chapter outlines the background and early stages of my research and describes Roy Harris's alternative view of the evolution of writing, which led me to focus on writing and human–computer interaction.

Prologue

This work started in 1992 in Tunis, the capital of the North African county Tunisia, and the site of the ancient Phoenician city of Carthage. Tunis is a place where Arabic, Mediterranean, African and European influences intersect. It's a multilingual environment: Arabic, French and, to a lesser extent, English and Italian, are spoken. It's also a multiscriptorial environment: both written Arabic and French are in everyday use.

An independent country today, Tunisia has been subject to a number of colonizations. Thus, fascinating traces exist of ancient written scripts, such as those of the Phoenicians, the Romans and the indigenous Berbers. These traces co-exist with an ancient iconography that includes powerful symbols, such as the fish and the Hand of Fatma, which are still considered to be protective against the evil eye.

I became acutely aware of language, writing and visual symbols during my time in Tunis. Usually at least two spoken languages and two written scripts surrounded me, an experience that had been extremely rare in my Australian life. I became interested in exploring spoken, written and pictorial languages in the new context of human–computer interaction (HCI), which was ironic, as one reason that I first went to Tunis was to escape from computers for a while.

I'd been working intensely with computers since 1979, firstly as a computer analyst/programmer. Later I became a three dimensional

computer animator and, then, a digital artist and lecturer. In each of these fields I'd been amongst the pioneers, inevitably having to work with computer systems that did not have particularly well-designed or accommodating human–computer interfaces.

The majority of computer users today have encountered computers since the Graphical User Interface (see below) was firmly established as a standard. However, my historical experience of various other human–computer interfaces and my technical understanding of how computers actually work meant that I was aware that the interface is an evolving technology and that the Graphical User Interface (GUI) is not the only solution. My first visit to Tunis occurred at a time when I was thinking about ways of creating alternative interfaces and it led me to focus ultimately on *writing* at the heart of my inquiry.

1 The human–computer interface

I had direct experience of the historical development of HCI because I joined the computer industry at a time when human–computer interfaces were much more basic than they are today. I started working for the multinational computer corporation, Burroughs (now UNISYS), near the end of the era when input to the computer was through a stack of punched cards and output from the computer was printed by a teletype machine. I also had access to a powerful computer that I could operate at a more fundamental level: inputting directly into its registers by setting switches on its front panel to indicate zeros and ones.

Thus, my computing apprenticeship initially involved poring over long strips of printed teletype paper and trying to decipher and remember the cryptic, text-based, commands and responses. Soon afterwards, we began to work with computers by typing directly onto a keyboard. We could see both the typed commands and the computer's responses on a screen called a visual display unit.

When I first encountered them, computers were (relatively) powerful mainframe machines that had a number of user terminals attached and sharing access to the mainframe's resources (processing power, printing, and so on). Then the so-called personal computers, which were first released around 1984, meant that each user had a fully functional (if initially a little underpowered) computer to themself. Later networking and the internet meant that the personal computer was no longer isolated and could once again share resources and information. A new human–computer interface accompanied this new breed of personal computers, the GUI, a technology based on research at Xerox's Palo Alto Research Centre (Johnson, 1997). The Apple Macintosh was the first personal computer to use a GUI and the IBM personal computer quickly followed suit.

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At the time of my first visit to Tunis 1992, the GUI was the norm for HCI, as, with some modifications, it still is today. However, because of my historical and technical background, I felt that computing had

settled on the GUI standard too quickly and that interfaces could be more kinetic, interactive and audiovisual than they were.

I was particularly interested in icons, that is, as Horton (1994) defines them, the small visual symbols on the screen. I suspected that they were being underused and that they functioned primarily as static visual equivalents of alphabetic names. Despite the fact that icons could be meaningfully moved within the screen space, for example, deleting a document by dragging its icon into the trash, I felt that their uses were more appropriate to the printed page rather than to a dynamic screen linked to a powerful computer.

It was not a simple task to experiment with alternatives. The conceptual tasks involved were broad and substantial computer programming was required to actually create alternative works, requiring considerable time and technical expertise. Then a new kind of software tool was developed and released into the market: the authoring program. This tool freed me from having to write highly technical programming code to perform such functions as updating the screen and handling input from users. It enabled me to focus on the design of the interface and the assembly of audiovisual elements into an interactive work. Amongst the first of these new tools was Apple's HyperCard, which was initially free to every purchaser of an Apple Macintosh computer. It included a high level programming language, HyperTalk, which could be used to program features that were not available in the standard HyperCard toolkit.

Today, due in part to the success of the internet, there are a substantial number of authoring tools available such as Macromedia's Director or Dreamweaver. In 1992, HyperCard, with its black and white graphics and 8-bit sound, was a pioneer in this field and offered the exciting possibility of creating new interactive audiovisual interfaces and environments without spending most of the time writing complex code.

2 *Xchange*, a language learning game

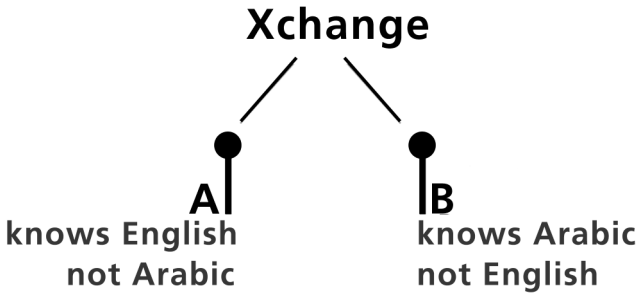
For my first experiment with language, writing, icons and interface, I developed *Xchange*, a language learning game. I created it using HyperCard and programmed its unique features using HyperTalk.

I designed *Xchange* to reflect some of my Tunisian experiences with communication and language. Frequently I had found myself trying to communicate with a Tunisian person who spoke no English. We would have to talk in French, a language that was the second language of the former French colony, but the mother tongue of neither of us.

I also found that I was learning spoken Arabic informally. After repeatedly hearing certain words or phrases they became recognisable and I would deduce meanings from the context and activities in which they occurred. An example was the sound *SeMahNey* (my phonetic transcription). I noticed people say it after accidentally bumping into someone in the street. I deduced that it meant the equivalent of *sorry* and later used it myself in similar situations, as I

found I could not walk in the street, talk in French and simultaneously avoid bumping into people.

I found this informal style of language learning fascinating and wanted to reflect it in the design of *Xchange*. I also incorporated my experience of spoken French as a mediator but, in its place, *Xchange* offered written English, Arabic and a set of visual icons I created.



The central idea was that a person who knew English but not Arabic (A), and a person who knew Arabic but not English (B), could simultaneously learn each other's languages through interaction with *Xchange*. Thus there would be no teacher–pupil relationship in this language learning game. Rather, through *writing* and *icons*, the computer provided a context and a means of mediation that enabled the players to informally teach each other. I also added some competition between the players as an additional motivational aid to learning.

I developed a simple vocabulary consisting of everyday nouns and verbs that were primarily about food, the natural world and basic needs. I added the equivalents of the pronouns, I and you. *Xchange* could concatenate these words into sentences made up of a randomly chosen pronoun, a verb and a noun. This formed simple sentences, such as the equivalents of *I like coffee*, *You see eggs*, and so on. Occasionally it created nonsense sentences, such as *You eat trees*.

Each word in the vocabulary was displayed as an animated icon and in written English and Arabic so that both players could understand it at the same time. Players were expected to supply the spoken equivalent of the words for each other. I concentrated on words that had reasonably obvious visual representations and developed a set of animated icons to express them. For example, the pronouns are represented by two stick figures standing together. The figure on the right points to *itself* to express *I*.

For *you,* the same figure points to the other stick figure. I also designed the vocabulary list (and linked icons) so that they were concealed and could be incremented at a later time.

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This section describes the three main screens of *Xchange* and is ideally designed to be read in conjunction with viewing the work itself.[1]

Opening Screen. Click on the finger pointing to the right to go to the next screen.

Screen 1 involves studying the word-animated icon combinations. A piece of Tunisian folkloric music plays while the screen randomly displays written English-Arabic word pairs and the corresponding animated icons. Players can direct this process by clicking a different icon.

Each icon animation plays five times, after which time a player can click on a new icon, or wait for another randomly chosen display, or click the finger pointing to the right to go to the next screen.

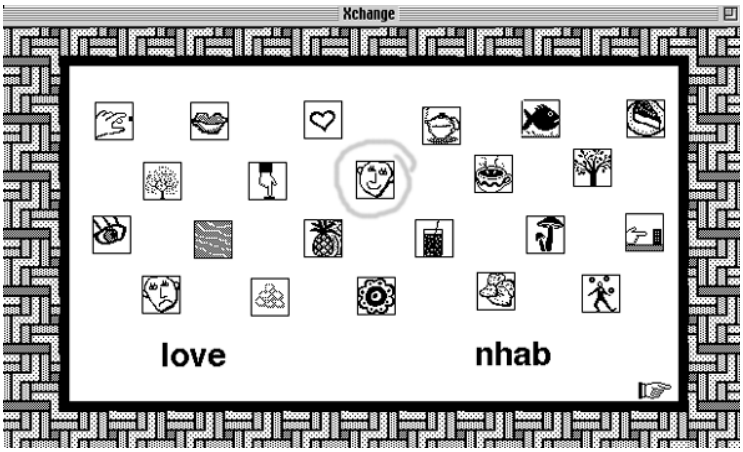

Figure 1 An example of Screen 1

Screen 2 involves each player competing with the other to recall the spoken foreign word associated with the icon displayed.

When a player clicks their stopwatch icon, *Xchange* randomly selects a word pair and displays it as an animated icon and as a written word in the language the player already knows (English for player A and Arabic for player B). Each player starts with a score of 10,000. A player's score drops until they have clicked the stopwatch to indicate that they have correctly spoken the foreign equivalent of the word (Arabic for player A; English for player B), as judged by the other player.

This process gives a simultaneous language learning experience mediated by writing and icons. For example, A, the English player, sees an English word and linked icon and tries to remember the associated spoken Arabic word. Meanwhile B, the Arabic player, is scoring whether A's answer in spoken Arabic is correct. At the same time, B is exposed to the written English equivalent of the word and hence has an informal opportunity to learn it.

The game can continue as many times as desired; click the finger pointing to the right to go to the next screen.

[1] A CD-ROM (Macintosh-compatible only) of the work is available at www.sallypryor.com/thesis.html.

Screen 3 involves viewing randomly constructed three word sentences, as described above. These sentences are displayed in written English and Arabic, along with their associated icons. The screen can be used as the players choose, because both the associated English and Arabic words can be displayed or hidden.

Click the finger poised over a button to display a new sentence; click on the right pointing finger to go back to the introductory screen.

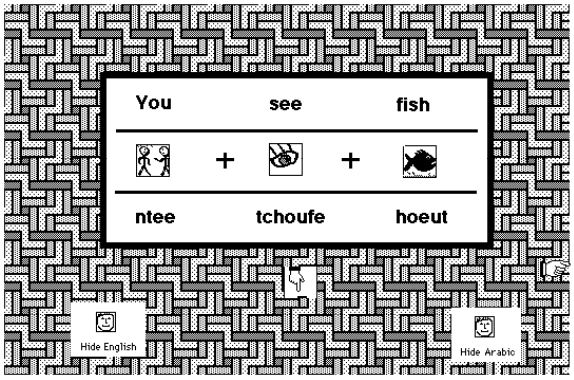

Figure 2: An example of Screen 3; sentences are randomly constructed using the vocabulary lists and displayed as a series of animated icons with English and Arabic text, which can be toggled on or off.

3 Outcome

Xchange worked moderately well as a rudimentary prototype of a tool enabling people who did not share the same languages, as described, to teach each other a basic spoken vocabulary from their own language by using the game as mediator and context.

However there were several significant limitations in the work. Firstly, I started with what I thought was a simple commonsense linguistic model, based on my understanding of speech and writing. This approach revealed its limitations as development continued and it became clear that my presuppositions about, for example, words, representation and the equivalence of spoken and written language required examination.

Secondly, the iconic language worked reasonably well as a mediator between the two people. However the written English was very weak as a mediator because of the notorious difficulty of deducing the spoken pronunciation of a word from its written English version. As for the written Arabic, I presented it phonetically in the English alphabet in order to reduce the complexity of my technical challenges. However this meant that while A (the English speaking player) could understand, it did not communicate cross-culturally and was not the way that B, the Arabic speaker, would read Arabic at all.

Thirdly, despite being more interesting than formal "drill and practice" language learning, *Xchange* was not really as much fun to use as I had hoped.

Xchange could also have been a tool that A and B used to construct simple sentences in order to communicate with each other across the language barrier, for example, giving information about personal tastes and so on. However Screen 3 was not designed to facilitate this function and the words could not be assembled into sentences by the players themselves.

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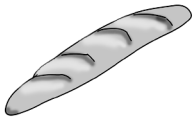
Although *Xchange* was not intended as a piece of academic research into linguistics, language teaching–learning, cross-cultural research or education it necessarily intersected with those disciplines. It soon became clear that the scope of the work was far too wide-ranging to usefully yield results. This was such a broad and multi-faceted area that it threatened to swamp any investigation. Clearly I needed to narrow the scope of the work and to develop the theoretical foundation, which is what I subsequently did.

However, as a testbed for investigation, the development of *Xchange* led to some interesting and fruitful discoveries. Creating the iconic symbols drew attention to the important difficulty of representing words visually. I had expected that animating the icons could overcome any problems. However, I found that ambiguity remained a problem, particularly with verbs. I had also expected that it would be uncomplicated to represent nouns pictorially. However the success of *Xchange* depended on the meaning of the icons communicating cross-culturally. Even such apparently simple things as bread and tea could not be represented by the same icon and still be understood cross-culturally. For example, bread could be expressed by the outline of a cut loaf for the English speaker.

This would not make sense to the Arabic speaker however, who was used to flat bread or a French-style baguette.



Likewise the pot of tea the English speaker would recognize did not look like the typical Tunisian glass of tea at all.

This struggle to represent words visually also drew attention to the asymmetry between visual and verbal modes of communication that quickly becomes apparent beyond the use of simple nouns.

It appeared to me that I might be re-tracing some of the steps in the historical development of writing. To research how, for example, the designers of hieroglyphic scripts managed these struggles with representation, I went to the British Council Library in Tunis. Fortuitously I found Roy Harris's book *The Origin of Writing* (1986) which, instead of outlining the conventional view of the evolution of writing from pictures, developed a rather original analysis of the origin and nature of writing itself.

Harris's analysis explained some of my Tunisian experiences and the problems I experienced with *Xchange*. It laid the foundation for a radically different way of conceptualising writing itself and led me to question for the first time whether writing actually represented speech at all. Ultimately Harris's seminal view was to form the foundation of my subsequent engagement with writing and human–computer interaction.

4 The origin of writing

> ... the origin of writing must be linked to the future of writing in ways that bypass speech altogether (Harris, 1986, Epilogue).

Conventional accounts of the history of writing describe some kind of evolution from pictures through picture writing to writing (such as Jensen, 1970, Gelb, 1963). "Real" writing is said to emerge when the pictures change from representations of things to representations of words. In *The Origin of Writing,* Harris (1986) argues that conventional accounts are flawed because they project modern assumptions about writing into prehistoric times.

According to Harris, the alphabet is assumed to be the "writing system *par excellence* ... towards which less 'advanced' systems were ... clumsily groping" (Harris, 1986, p.7). As a result of this assumption, the function of writing is seen to be the representation of speech. The influential linguist Saussure was quite unequivocal about this: "[a] language and its written form constitute two separate systems of signs. The sole reason for the existence of the latter is to represent the former" (Saussure, 1983, p.24). The idea that true writing represents units of sound is a powerful presence in most discussion of writing and is very difficult to shake off.

Harris argues that the letters of the alphabet do not actually "represent" the sound of speech at all, rather that this is merely a "pedagogically inculcated illusion" (Harris, 1986, p.92) that made it easier for us to learn to read and write. Thus it is, according to Harris, that we "misconstrue correlational patterns between letters and sounds as evidence of an intrinsic representational relationship" (Harris, 1986, p.92). Harris suggests that the central problem with the way that writing is conceived is that the alphabet's capacity for indicating pronunciation has been erected into the theoretical criteria for recognizing what is "real" writing and what is not. Thus the history of writing is conventionally framed as a quest to represent the sounds of

speech, with the *rebus* presented as a first attempt to write phonetically.

Harris proposes an alternative view of the origin and nature of writing. Rather than evolving from pictures into the representation of words, writing may have actually diverged from pictures through inventive responses to the increasing complexities of ancient record keeping.

To explain this invention, Harris proposes an ancient concept he calls *graphic isomorphism,* such that a sequence of marks makes sense equally as picture and as writing. Although it is difficult to imagine the "enormously diverse" functions of pictorial and scriptorial signs coinciding today, we cannot assume that this modern division has always been the case. Harris claims that it *is* possible to imagine pictorial and scriptorial signs coinciding "in the appropriate context of culture ... [in which] for instance, names and totems are treated as complementary aspects of identity" (Harris, 1986, p.131).

Harris gives the example of a tribe with a wolf as its totem. Whatever form the wolf mark takes, that is, it need not resemble a wolf, the mark simultaneously "stands for" the totem animal and the name *wolf* as complementary aspects of the identity of the tribe. The question of whether the wolf mark is scriptorial or pictorial would not even arise because

> the name is not treated as a convenient verbal label any more than the mark is treated as a convenient visual logo for purposes of classification. Both are integral to the essential spirit or being of the people (Harris, 1986, p.131).

Thus something we take for granted, that is, our modern distinction between pictures and writing, would not apply in this context. For Harris, this form of symbolism reflects

> a widespread attitude to the mystical status of names, images and identities in both pre-literate and literate cultures ... [and] a mentality for which reality is still not clearly divisible into language and non-language, any more than it is divisible into the physical and metaphysical or into the moral and the practical (Harris, 1986, p.132).

The wolf mark also exemplifies what Harris calls an *emblem* and is a "remote ancestor" of contemporary emblems such as family crests, religious symbols and trademarks. However, these contemporary em-

blems are usually not graphically isomorphic; for example, the graphic sign below is an emblem of Christianity although it does not also "stand for" the name *Christianity*.

To understand the origin of writing, Harris advocates the recognition of just "two primordially distinct varieties of autonomous visual sign": the *emblem* and the *token* (Harris, 1986, p.131). As he explains it, an emblem has a fixed value. It is identified with just one entity, such as a family, a religion, a company, and so on. Another emblem does not indicate another entity, but the same entity again. Thus another cross sign does not indicate another Christian religion but the same one again. A token has the opposite property: another token *does* indicate another entity. A prisoner's notches on the cell wall provide an example of tokens: each notch indicates another day has passed.

Harris proposes that numeracy must have come before literacy and that counting originally involved simple marks. These marks were tokens: another mark indicated another item. They were also graphically isomorphous with finger counting (Harris, 1986, p.137). Taken together, they could be interpreted as a picture of a number of fingers or as scriptorially standing for a certain number.

According to Harris, increasing communicational complexity (such as the need to count more than one category of items or to involve more than one person in the process) required more complex systems. This could result in the gradual deployment of the emblem for non-emblematic uses, a process that was unlikely to have been a simple cultural evolution of the administrative uses of formerly sacred marks. Nevertheless, the use of a former emblem as a token for "utilitarian" counting purposes, enables, for example, the following method of recording five sheep:

Figure 3

This is still graphically isomorphous communication. The list could be a written record of five sheep or a picture of five sheep.

A less time-consuming solution might be provided by the combination of these two primordially different signs to creates new communicational possibilities:

Figure 4

However, Harris points out that this development involves a major change in the meaning of the sheep sign, because while "both lists make the same information available, they involve using marks in different ways" (Harris, 1986, p.39). In Figure 3, the sheep sign indicates another sheep and is thus a token to be counted. In Figure 4 it is a classificatory device and is no longer a token. Figure 4 can no longer be read as a picture of five sheep. For Harris this is "the thin edge of the semiological wedge which will ultimately prise pictorial and scriptorial signs apart" (Harris, 1986 p.140) and hence disrupt graphic isomorphism.

An even less time-consuming record of the five sheep would be provided by

Figure 5

In this list, separate symbols have been developed for individual integers. For Harris this development demonstrates another major change. Figure 4 is still a *token-iterative* system that works equally well with countable objects such as clay counters, beads or graphic signs. Figure 5 is an *emblem-slotting* system that no longer involves counting objects at all. Instead, the technique of "slotting" is deployed, "a structural technique we now regard as intrinsic to language ... typically ... with counting" (Harris, 1986, p.145). A separate "slot" has been created for indicating the number of sheep. This requires the development of a separate set of symbols to indicate individual integers, a task for which graphic signs are more adaptable than objects such as clay counters or beads.

Thus, Harris argues that the "great invention" in the history of writing took place at a more fundamental level than is conventionally assumed. Rather than the representation of speech being treated as the criterion for recognizing the emergence of writing from pictures, he suggests an alternative view. In this view writing and pictures originally coincided and the "great invention" was almost certainly the disruption of this original *graphic isomorphism* with

> the prehistoric move from a token-iterative to an "emblem-slotting" system for recording numerical information ... [and that] It is typical of linguistic structures as opposed to pictorial representation to "separate" properties and quantities from objects and express them by means of independent signs (Harris, 1986, p.145–6).

For Harris the rebus, a device appearing in early writing systems, does not represent an early attempt to write the sounds of speech, as is traditionally assumed. In contrast it is an attempt to retain graphic

isomorphism by providing a pictorial sign for information that cannot otherwise be represented pictorially (Harris, 1986, p.49).

This alternative view of the rebus was echoed by my experience in Tunis. I found Tunisian names quite challenging as many were completely unfamiliar sounds and I could not remember them. An example is the name *SHEDly* (my phonetic transcription). I had to devise a way to remember this name and came up with the following English rebus to help me.


(shed lea)

This device recalls Harris's alternative view of the rebus because while a name from a foreign culture can seem like a noise, a name *within* its culture may well have an associated pictorial sign. For example, the Arabic name *Assad* has the pictorial sign below, as it is also the Arabic equivalent of *lion*.

This suggests that Harris's explanation of the rebus is plausible in the context of cross-cultural communication. It this context, the rebus offers a solution to the challenge of creating a graphic sign for a name (as distinct from an object) that, because it comes from outside the culture, similarly seems like an unfamiliar noise and has no obvious pictorial equivalent.

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To return to Harris's central argument, it is a major mistake to use speech as our primary model for written communication and we have

> not so far exploited anything like the full range of communicational possibilities made available by this twin recognition of the independence of graphic signs and their structural plasticity (Harris, 1986, p.157).

Harris points out that, "graphic signs are free to be adapted – systematically or unsystematically – to any particular communication purpose desired" (Harris, 1986, p.155) and that they may utilise "patterns of structuring which can be interpreted by reference to experience of any relevant kind whatsoever, or to none" (Harris, 1986, p.156). Visual experience is *just one* possible source as is oral communication.

5 The foundation of my research

> On the borderline between art and technology stands writing (Jean, 1994, p.129).

Harris's historical reconceptualization of writing and his recognition of the untapped communicational potential of the graphic sign required further examination and exploration, and suggested a new focus for my investigation. It was clear from the issues previously outlined that the scope of my experimental testbed needed to be considerably narrowed. As a result, I terminated development on the unwieldy *Xchange,* with its impossibly broad exploration of icons, speech, writing and cross-cultural communication.

As mentioned, in Tunis I had also begun to be intrigued by the concept of writing and to see it in a new light. Partly this was because of my everyday exposure to written Arabic. It was also as a result of Tunisia's ancient scripts and symbols. Although I had missed the major Tunisian exhibition *Ecritures en Mediterranée*, the poster and catalogue caught my eye.

> Pour la Tunisie trois mille ans d´écriture! quelles richesses inestimables (Fantar in Alif, 1988, p.9).

The exhibition alerted me to the richness of Tunisia's three thousand years of writing. For example, the Tunisian city, Kairouan, had a strong influence on Arabic calligraphy and played an important historic role as an Islamic centre and cultural crossroads, rivalling the influences of Cairo and Baghdad (Kamarti, in Annabi et al, 1995, p.8).

The exhibition included the ancient Phoenician and Libyan scripts and a contemporary version of Libyan, Tifinagh. These unfamiliar and often quite beautiful scripts also drew my attention to the visual–pictorial aspects of writing and away from the links with speech that my primary school education had encouraged me to accept and which Harris insists we question.

My new awareness of writing and of the richness of Tunisia's history of writing led me to focus on writing itself at the human–computer interface. I began to develop a new work to explore these ideas in practice. I wanted to retain the Tunisian context because my engagement with Tunisian culture had had a strong influence on me and, as an artist, I increasingly wanted to express this.

In my research for and development of *Xchange*, I had separated artistic expression from research practice. In the new work I proposed to combine art and research in the one work; to create a work that brought together the strengths of both artistic and theoretical inquiry. In this way I set out to create a work that was stronger than either might be alone.

I set the new work in the context of a personal and loving portrait of Tunis. Instead of the game model of *Xchange,* I chose the (then) new media form of *interactive multimedia* with its hyperlinks and rich media content. The new work was designed to be as broad explor-

ation of writing, and of Tunisia's ancient and modern written scripts and symbols. At the same time it was to explore some of the transformations of writing made possible by HCI. I chose to work with Director, a newly released authoring tool that could incorporate much richer interactive audiovisual components and more sophisticated custom programming. The first step was an analysis of theoretical responses to the apparently simple question, *What is writing?*

Chapter Two
The theoretical background

This chapter will discuss theoretical approaches to the question *What is writing?* and discuss the foundations and limitations of the traditional view that real writing represents human speech. The chapter outlines Harris's more recent work, which is based on the theory of Integrationism, and shows how this approach offers a powerful and alternative conception.

1 What is writing?

> The question "What is writing?" sounds absurd in a literate society, because in a literate society we all think we know the answer. I wonder whether we do (Harris, 2000a, p.53).

> I know, but when you ask me I don't.
> —St Augustine's answer to the question, "What is time?"
> (cited in Watts, 1979, p.57).

It is important to clarify what writing actually is before exploring the possible ways it might be transformed by HCI. However this is not a simple task. As the saying goes, "If you want a definition of water, don't ask a fish". In a similar way, it is extremely hard to define writing. It is all around us and we use it constantly.

As discussed, Tunisia encouraged me to re-examine my understanding of writing through exposure to its intriguing ancient scripts and symbols and to written Arabic. My thinking was also shaped by several everyday experiences in Tunis.

One example was going to the movies. French is the second language of Tunisia but my French, although much better than my Arabic, was not very strong. I found that I could not keep up with movies that were dubbed in rapid streams of spoken French. But if the movie was subtitled in written French I had a chance. The subtitles separated the individual words for me and also stayed visible long enough for me to re-read them a few times.

Another challenge was that I found it difficult to transcribe information given in French over the phone. A telephone number would usually be expressed as two numbers in the thousands. For example if the phone number was 234 916, French speaking Tunisians would say the equivalent of "two hundred and thirty four, nine hundred and sixteen" instead of "two, three, four, nine, one, six". I found that I could not "translate" the spoken French numbers fast enough into a sequence of integers and would have to write down a near-phonetic transcription of what I heard and then sort it out into six integers when the call was over. Similarly when a word was spelled out using the French names of alphabetic letters, I found it more effective to

write down what I heard and later "decode" the French names into the written alphabetic letters themselves. These experiences with French made me think about the differences between speech and writing.

Another pivotal moment occurred when I was flying out of Tunis and had handed my exit card to the Immigration officer who then determined that, as a resident, I needed to purchase a special stamp. I returned with the stamp but my card was now within a large pile of similar cards and time was running out. I realised that to find my card he would have to read the name on each card and compare it to my name. In contrast, I was very familiar with the visual pattern of my own name and could quickly scan the cards (without reading each name) in order to find my own card. Fortunately I was permitted to search through the pile myself and managed to catch my flight. This experience made me aware of writing's strong links with drawing.

A different experience in Tunis reminded me that there are also degrees of proficiency in literacy. I, the writer of this text, and you, the reader of it, can only communicate through this printed page because we are both sophisticated users of alphabetic writing. This was not the case for my Tunisian mother-in-law who grew up at a time when Tunisia was a French colony. She did not have the opportunity to engage in formal education and could not read or write, although she had acquired numeracy. Watching her try to sort through a pile of old papers and noticing that she could not distinguish between official correspondence and letters from a son's childhood pen pal reminded me that at a fundamental level I take my literacy very much for granted.

So this analysis of writing takes shape in a context where a reasonably high degree of literacy is assumed. And the analysis must be expressed *in writing*, leading to an inescapable reflexivity. It is clear that an objective science of writing is impossible because there can be no science, as we understand it, without writing.

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The challenges associated with finding a definition of writing have not dissuaded academics and theorists from a wide variety of disciplines from trying. There is by no means consensus. One problem is that the accounts originate from so many different disciplines, including archaeology, anthropology, linguistics, philosophy, educational psychology, literary criticism, postmodern critical theory and so on. As a result, discipline-specific theoretical foundations or lay understandings may be assumed but not stated by the theorist. Words or phrases such as language, picture writing, sign, symbol, word, notation or code can be used as if their meaning is obvious to all, rather than needing to be clearly defined. The word *sign*, for example, can have different meanings depending on the discipline in question, as will be discussed later in this chapter.

These confusions result in a lack of clarity and also a tendency to make ethnocentric assumptions that couple alphabetic writing with civilised or sophisticated cultures. This prompted Harris to observe that "[t]he views we encounter in histories of writing to this day still reflect the views of the literate class about its own superior status" (Harris, 2000b, p.6). As discussed in Chapter One, alphabetic writing is usually assumed to be the end result of a process of the evolution of increasingly sophisticated writing systems – progressing from pictures through picture writing to logographic (word) writing and finally to the triumph of modern alphabetic writing. This assumption of the alphabet's communicational sophistication and efficiency can also be seen as an expression of *technological determinism*, that is, the idea that a technology succeeds because it is the most effective, rather than as a result of social and cultural forces.

Most people in Western cultures are familiar with at least three types of writing, that is, alphabetic writing, mathematical writing and musical notation. Nevertheless, the common assumption that writing represents speech persists. A recent example, reported in the *Los Angeles Times*, concerned the discovery of an inscribed seal that suggested the controversial idea that writing may have occurred in Mesoamerica much earlier than was previously thought.

> The symbols fit "a loose definition of writing", said Yale archaeologist Michael Coe, but a stricter definition would require their linking to specific words in a spoken language (Maugh, 2002).

As outlined in Chapter One, Harris argued that this assumption of writing representing speech needs to be questioned. However it is extremely difficult to dislodge conceptually for four main reasons. Firstly, the simplifying assumptions that are used to teach the alphabet in Western countries ("A is for apple" and so on) encourage this belief. As already discussed, Harris argued that a pronunciation guide is not the same thing as a representation and that "correlational patterns between letters and sounds" are not evidence of "an intrinsic representational relationship" (Harris, 1986, p.92). I will return to this question of representation of speech later.

Secondly, whether alphabetic writing actually represents speech or not, there is no question that it is a form of writing that is strongly *linked* to speech. However, there are other forms of writing, such as mathematics and musical notation, that are not strongly linked to speech. A major problem with most accounts of writing is that they focus on the speech-linked forms and marginalize the others. In fact it is very hard to think about writing at all and not be influenced by the enormous social, cultural and political importance of alphabetic writing. However, as Harris has pointed out (Harris, 1998 p.116), social importance is not the same thing as theoretical importance. In other words, just because one type of writing is culturally dominant does not mean that it is theoretically privileged or that it should be used as the paradigm case.

Thirdly, when we think of writing we are powerfully influenced by the writing space of the modern book. Consciously or unconsciously, we often take the mechanically printed book as the paradigm case of a written text. There is a sense that writing at its most basic or fundamental level is the "grey text" of a printed book.

Lastly, it is hard to think about writing as a language at all without somehow returning to speech. As Kristeva suggested,

> the science of writing seems ... the prisoner of a conception that confuses *language* with *spoken language,* which is articulated according to the rules of a certain grammar (Kristeva, 1989, p.29).

However hard we try to avoid this confusion, it has a habit of creeping back into the ways we think about writing. Thus, the majority of discussions of writing firmly link it with speech. Arguably the most notable proponent of this view is the influential linguist Saussure, for whom, as mentioned previously, writing existed solely to record speech. For Diringer also, writing is "the graphic counterpart of speech" (Diringer, 1962, p.13) and for Goody it is "that which makes speech an object" (Goody, 1986). More recently Jean stated that the "representation of sound lies at the root of all true writing" (Jean, 1994, p.16) and Robinson that "full writing cannot be divorced from speech: words, and the scripts that employ words, involve both sounds and signs" (Robinson, 1995, p.17). Note the use in the latter two quotes of the ethnocentric terms *full* and *true*.

Because writing is so strongly linked with speech, there is also a widespread perception that it is *linear,* as for example, "[w]e may legitimately speak of a sign system as a writing system when the message is delivered in a linear fashion" (Jean, 1994, p.25). However the issues of the linearity of speech and also the linearity of alphabetic writing need to be questioned and I will return to this later.

Gelb attempted to outline a new and sorely needed science of writing and defined writing more generally than many other theorists as "a system of human intercommunication by means of conventional visible marks" (Gelb, 1962, p.12). He labelled his science of writing *grammatology,* a term later appropriated by Derrida (Derrida, 1976). However his landmark work on writing was merely a classification of writing systems, focused primarily on those linked with speech and assuming the usual triumphant evolution of alphabetic writing.

As discussed in Chapter One, writing can also be linked with pictures, or, more generally, with graphic signs. This view is usually marginalised, consigned to the past or even forgotten, perhaps because of the Western cultural dominance both of printed texts over handwriting and of writing over pictures. In *The Cambridge Encyclopedia of Language* Crystal observed:

> Writing should not be seen as merely "transcribed speech", because its formal characteristics, and its strategies of production and comprehension, are quite unlike those encountered in speech (Crystal, 1992, p.177).

Even though Crystal went on to discuss some graphic aspects of writing, he revealed his privileging of speech by giving the traditional view of the history of writing and declaring alphabetic writing to be the "most economic and adaptable of all the writing systems" (Crystal, 1992, p.202).

Some non-Western cultures, such as Chinese and Arabic, give greater importance to the visual aspects of their written scripts. In the West, it is the artists, graphic designers, typographers and calligraphers who have found it easier to resist the siren call of speech and to explore connections between writing and pictures. However, most would not go so far as to agree with the artist Paul Klee when he claimed that drawing and writing were fundamentally identical (Naubert-Riser, 1990, p.116).

Theorists other than Harris also associate writing more with pictorial space than with speech, most notably Derrida (Derrida, 1976) and Kristeva (Kristeva, 1989).

Derrida unequivocally rejects the Saussurian view of writing's dependence on speech: "Writing is not a sign of a sign, except if one says it of all signs, which would be more profoundly true" (Derrida, 1976). Derrida's analysis of writing was an intrinsic part of his powerful critique of the metaphysics of the Western philosophical tradition and its embedded and unequal binary oppositions. As Spivak explains it, Derrida identified *phonocentrism* (privileging the spoken) as a symptom of *logocentrism*, the belief that

> the first and last things are the Logos, the Word, the Divine Mind, the infinite understanding of God, an infinitely creative subjectivity, and, closer to our time, the self-presence of full self-consciousness (Spivak in Derrida, 1976, p.xviii).

Derrida declared speech to be dependent on writing, not so much as literal truth but to draw attention to the idea that speech and writing have the same essential features (Palmer, 1997, p.130). According to Collins and Mayblin, Derrida

> re-conceptualises writing as an undecidable: the play of presence/absence and radical difference across speech as well as script. This is the play designated by Derrida's terms, *the trace* and *the gram* (hence *grammatology*). And by his term *writing* (Collins and Mayblin, 1996, p.74).

I found it difficult to apply Derrida's ideas to practical experimentation with HCI and writing and, in any case, as Spivak explains, for Derrida the term *writing* is given to "an entire structure of investigation not merely to 'writing in the narrow sense', graphic notation on tangible material" (Spivak in Derrida, 1976, p.xix). However, Der-

rida's concept of the *gram*, both "a structure and a movement", as explained by Kristeva (Kristeva, 1989, p.332) was potentially useful, as was his advocacy of a new form of "pictographic" writing, one that could avoid some of the problems of logocentrism: "beginning to write without the line ... according to a different organization of space" (Derrida, 1976, p.86).

However, this "nonlinear" writing of Derrida's imagining is rather difficult to translate into material form. Kristeva suggests this is because

> we as subjects belonging to a cultural zone in which writing is phonetic and *literally* reproduces phonetic language find it difficult to imagine that a type of language – writing – could have existed and still exists today for many peoples that functions independently of the spoken chain, a type of language that is consequently not *linear* (as in the emission of voices) but *spatial* and so registers a mechanism, of difference where each mark's value depends on its place in the traced whole (Kristeva, 1989, p.26).

Kristeva recognized that the understanding of writing as alphabetic writing, which is in turn seen as linear and representing speech, significantly limits our ability to understand writing in general, especially the kinds of writing that are less linked with speech and more visually–spatially oriented. This is a general problem in conventional discussions of writing. Unsurprisingly, therefore, typologies of writing systems continue to be established in terms of relationships to speech, rendering phonographic, that is *sound-writing*, the most sophisticated and important. Harris called this *pronunciation* writing (Harris, 1986, p.32).

The many forms of writing that are not linked to speech are often thrown together into one broad category. Gelb coined the term *semasiographs* for writing that is not linked to speech and hence "represents ideas directly" (Jensen, 1969, p.29). Alternatively the terms *logogram, pictogram* and *ideogram* are used. An interesting alternative to *ideogram* is Klee's term *script-pictures* (Naubert-Riser, 1990, p.18).

The most widely used terms are:

- logograms;
- pictograms (or pictographs); and
- ideograms (or ideographs).

The first term, logogram, refers to word-writing, that is, the representation of a word which will be voiced differently in different languages. An example is the logogram 9, which can be voiced as *nine*, *neuf* , *tissa,* and so on.

The other two terms, pictogram and ideogram, have a variety of definitions (assumed or explicit) that generally link them to pictures and not to speech at all. The most clear-cut definitions are that:

- a pictogram is a simplified picture of the thing represented;
- an ideogram represents an idea in general.

However these distinctions are unstable and quickly break down when actually applied. To study these terms in practice, we can try to select one of them to classify the graphic sign at the beginning of the following line:

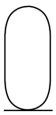
☎ 99543221

Does ☎ represent

- a word: telephone (in English), téléphone (in French), هاتف (in Arabic), and so on, thus classifying it as a *logogram*?
- a simplified picture of the thing represented (a somewhat old-fashioned telephone), thus classifying it as a *pictogram*?
- the idea of telephoning in general, thus classifying it as an *ideogram*?

There is no satisfactory way to decide whether ☎ is a pictogram, an ideogram or a *logogram* because we cannot clearly decide what it represents. However, we do understand what it *means* and that its proximity to the integers that follow changes the way we interpret them. We know that they do not indicate the number *ninety nine million, five hundred and forty three thousand, two hundred and twenty one* but are in fact a sequence of telephone keys to press.

Thus the terms of logogram, pictogram and ideogram do not seem to provide a very solid foundation, although they are very widely used. The term *hieroglyph* is also deployed to denote writing that does not represent speech. Although it triggers a pleasing association with the visual beauty of hieroglyphic inscriptions, the term is otherwise inaccurate. Hieroglyphic writing "gives the impression of being pictorial" and often appears in conjunction with pictures. However according to Crystal it is actually a mixture of several different writing systems including "ideograms", phonograms and determinative signs that have no phonetic values, such as the cartouche that identifies the word within it as a royal name (Crystal, 1992, p.199).



There are an increasing number of examples of modern "semasiographs", such as

- logos;
- trademarks;
- international airport signs, for instance  ; and
- computer icons, as mentioned, for instance  .

An interesting example is  , which is sometimes expressed as O(-+>, the graphic sign for "the artist formerly known as Prince". The creation of this sign caused confusion because it was specifically given no spoken equivalent.

The development of these modern "semasiographs" has stimulated discussion of the manner in which such signs communicate meaning

(such as Horton, 1994). However, this discussion also becomes enmeshed in the problem of defining what is represented and in addition, suffers from the disadvantage of being isolated in what is generally called "visual communication" studies. It is rarely integrated into theories of writing itself because writing that is not tightly linked to speech is marginalized or treated as a forerunner of "real" writing (such as Gelb, 1963). The problem arises from the conception, conscious or unconscious, that real writing represents speech. This results in a widely accepted but significantly impoverished theory of writing which labels writing that is not tightly linked to speech as "primitive" and unsophisticated: more direct but also more ambiguous (Crystal, 1992, p 197). These forms of writing are defined primarily by what they are not (that is, not tightly linked to speech), which makes it difficult to explore what they *are* and how they communicate, particularly in the visual–spatial domains. More generally, the total inadequacy of the "writing represents speech" model is revealed by its inability to theorize *all* kinds of writing, including other forms of non-speech-linked writing that cannot possibly be labeled primitive and unsophisticated, such as music, mathematics and, I would suggest, computer programming.

Kristeva realised that this was a problem, pointing out that a study of writing's unique characteristics rather than its relationships with speech was yet to be produced:

> the science of writing as a new realm (and until our time its specificity has been misunderstood) of linguistic operation; of writing as language, but not as vocal speech or grammatical chain; of writing as a specific signifying practice that enables us to perceive unknown regions in the vast universe of language – this science of writing has yet to be developed (Kristeva, 1989, p.30).

One of the major problems in existing theories of writing seems to arise from the assumption that even if writing does not represent speech, it must represent *something*. Thus, even when the idea that "writing represents speech" is ushered out the front door, the representational model necessitates a search for the something else that writing does represent. As discussed, it is very hard to conceive of written language that is not linked to speech because of the confusion of language with *spoken* language. This leads to speech sometimes sneaking back in via the tradesman's entrance as the something else represented, as in the concept of the logogram. Further, the lack of practical clarity about what is actually represented in the pictogram/ideogram definitions suggests that representation has serious limitations as a conceptual framework for writing in general.

However, it is extremely disconcerting to let go of a conceptual focus on what writing represents because our everyday experience is

that writing means something. So what is the difference between representing and meaning? Are these two terms equivalent or can they be prised apart? An everyday example is the integer 0. It literally represents nothing, although it does not always mean nothing, as we can clearly see in the difference between the following two numbers:

21

201

Here we can see that 0 has created meaning in the second line through the spatial principle of *positional notation*, thus changing the way that the 2 sign is interpreted.

How can we change our focus from a view that writing represents something to an understanding of how writing means something? Clearly we need to begin the analysis with a more general theory of language and human communication. This is the approach taken by Harris in his more recent works on writing published after *The Origin of Writing*. Harris bases the new works on *Integrationism*, a specific theoretical understanding of human communication (Harris, 1995, Harris, 2000b). The theory of Integrationism makes a useful intervention in these complex and often confusing debates about the nature of writing. However, as a general theory of human communication in all its forms, both linguistic and non-linguistic, it challenges existing terminologies and assumptions and proposes a new set of concepts to explain the difference of its approach.

2 The Integrational approach

Integrationism is the name given to an approach to language and communication originally developed by a group of linguists at the University of Oxford during the 1980s, and continued internationally since then. Roy Harris is one of its leading theorists. He has described its general approach as follows:

> Human communication is an essentially creative enterprise, part of a continuous attempt to integrate the present with the past and the future. The success of this attempt depends crucially on the ability to contextualize ongoing events rather than on any mastery of established conventions (Harris, 2000c).

Integrationism opposes the segregationist theory that "communication systems (codes) exist autonomously as social facts, *independently* of their users" (my italics; Harris, 2000d). Thus for Integrationism, an act of communication cannot presuppose languages (codes) to be already present and available for use, in fact, the opposite is true (Harris, 1998a, p.5). Language must presuppose communication itself: there can be no language without communication. The meaning of language is in its integration of activities, rather than being something that is conveyed in *addition* to other activities. Thus, for Integrationism there can be no fixed boundaries between the linguistic and the non-linguistic and no abstract meanings of language that exist regardless of context.

Thus, Integrationism utterly rejects the common view that human communication takes place through the combination of a set of tools and their use in action, for example, the idea of a spoken language and its use in speech or of a written script and its use in writing. For the Integrationist these are not separate categories but are thoroughly integrated with each other. There is no "fixed code" that we simply select from in order to communicate, no simple transmission of an object or message. Hence, for Integrationism, communication cannot follow the familiar (and so often simply assumed) sender–receiver (or encode–decode) model at all.

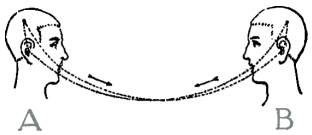


Figure 6 Saussure's sender–receiver model (Saussure, 1983)

For Integrationism there is no "semiological tennis ball" transmitted between communication participants; rather their communication is a function of the *interaction* between them (Harris, 1995, p.64). Thus, for Integrationism human beings are language makers rather than language users (Harris, 1980). Signs are created through communication and have no meaning except in a specific communication situation.

This appears to conflict with our everyday experience that we do select from fixed codes in order to communicate and that it is the code that determines the meaning, for example, when we choose words to speak to someone. As Harris points out, we "are accustomed to thinking that most of the words ... [we] use in ... daily communicational exchanges are not created on the spot but have been in existence for a long time" (Harris, 1998a, p.53).

In order to probe this assumption, Harris suggests we question how in practice "we judge that verbal communication has been successful ... [and how we judge] what other people mean by what they say" (Harris, 1998a, p.41). How, in practice, do we know what someone means by a word? How do we ascertain with a word such as *nail* whether it is something to bang with a hammer or paint with polish? Can we explain how "signs became available before they were actually employed for communicational purposes" (Harris, 1996, p.23)? How can new words come into existence and how can words change meaning, for example *gay* and *cool*?

For Harris the answers to these questions involve abandoning the idea that "verbal communication involves the kind of activity which allows the linguistic components to be distinguished from the non-linguistic and analysed systematically without reference to the latter" (Harris, 1998a, p.10). In fact, for Harris

> all words begin, in our experience, as words of "unknown meaning" ... "meaning" is the value we seek to attribute to words so as to make some kind of sense of this or that episode of communication in which they feature ... our search for the "meaning" stops when we have discovered how to integrate the occurrence of the word into enough of our linguistic experience to satisfy the requirement of the case ... [and] our search for "meaning" is articulated to a large extent metalinguistically (by asking questions, consulting dictionaries, etc.), i.e. is essentially dependent on the reflexivity of language" (Harris, 1998a, p.69–70).

As an example of the reflexivity of language, *The New Penguin English Dictionary* offers as one of three definitions of the word *difficulty* "being difficult"!

Harris cites Humpty Dumpty as "perhaps the most famous champion of the thesis that words mean whatever the speaker wants them to", but in Harris's view the speaker is not in charge of meaning any more than the listener is passive (Harris, 1998a, p.71). In fact, for Harris "coming across a word for the first time is not a 'special case' and therefore unreliable as a guide to the nature of meaning" (Harris, 1998a, p.70). He argues that this is the same as *every case* except that "the similarity is disguised by our hubristic readiness to assume that our past linguistic experience provides all the information we need in order to assign semantic values in present and future cases" (Harris, 1998a, p.70).

Or, to put it another way, although we may have developed influential social understandings about a word through the activities it has integrated in the past, its precise meaning as a sign in any situation is created by the activities integrated in that context. Harris has linked this with the Heraclitan view that one cannot step into the same river twice. For Harris one cannot step into the same context twice any more that one can say "the same thing over again" (Harris, 1998a, p.98).

Harris is not of course the first theorist to point out the complications inherent in the concept of a word. This has been the subject of much debate, both within and outside the linguistic community. Wittgenstein declared that "[i]f we look at the actual use of a word, what we see is something constantly fluctuating" (Wittgenstein, 1974, p.77). Watts pointed out that naming something does not actually define it and that "we are all bewitched by words. We confuse them with the real world, and try to live in the real world as if it were the world of words" (Watts, 1979, p.46).

For Harris a focus on words also decontextualizes the particular communication interaction: "the sign is confused with its verbal component, and the vocal form of that component is mistaken for the sign itself. What made the utterance significant in the first place – its integration with other components of the situation – drops out of sight" (Harris, 1998a, p.54).

Harris and Wolf explain this more generally:

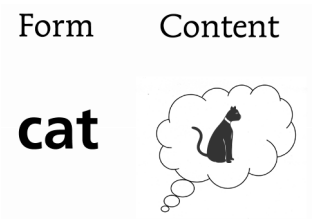
> we take the term Integrationism to allude to a recognition that what makes an utterance (or any other form of expression) language is not its conformity to the requirements of a code but its function in integrating other human activities, that integration being what makes communication between one human being and another possible (Harris and Wolf, 1998, p.1–2).

Harris challenges the importance given to the distinction between verbal and non-verbal communication altogether and, as will be discussed, does not believe that this distinction is central to typologies of writing. For Harris, a distinction between verbal and non-verbal communication is "far less clear-cut than many have assumed" (Harris, 1996, p.25). This is not because grunts and sighs, for example, might count as speech. For Harris it is that

> in order to recognize the distinction between verbal and non-verbal communication at all, we have to adopt a perspective which makes it legitimate to identify one communication system by implicit reference to another, thus establishing or denying equivalences between units belonging to different systems ... In short, the distinction between verbal and non-verbal communication is itself parasitic on the very mode of theorisation that treats it as basic (Harris, 1996, p.25).

Harris calls this view the *fallacy of verbalism*. This is exactly the kind of deceptively circular reasoning that many overlook but that Harris detects and dissects with great clarity. The theoretical flaw he finds at the heart of verbalism is that verbal communication is privileged and coupled to one of two terms that are established as binary opposites that somehow also explain each other by their difference.

Harris claims the fallacy of verbalism is "more or less endemic in the Western educational tradition ... founded on writing and the transmission of written texts" (Harris, 1996, p.25). He argues that it leads to the assumption that all signs of communication must operate somehow like words, that is with a form on one side and a meaning on the other:



For Harris verbalism is founded on two assumptions that Integrationism specifically opposes. The first is the sender-receiver model of communication, that is, the idea that

> words enable thoughts or ideas to be transmitted from one person's mind to another's. The other is the sociological assumption that languages (English, French, etc.) are fixed codes, put in place by society to enable this transmission to take place (Harris, 2003, p.185).

These two assumptions prop each other up: thoughts cannot be successfully transmitted from one mind to another by words unless the two people share a fixed code language where words mean the same thing for each of them.

Harris notes that the work of Saussure challenged the dominance of verbalism but that Barthes subsequently restored its importance.

> Verbalism suffered its first major setback in modern culture when Saussure proposed that languages were subject to the same semiological principles as governed all other systems of signs. But any ground thus lost was more than recovered by Roland Barthes' influential reversal of Saussurean priorities and his claim that our knowledge of other signs "can be only a copy of linguistic knowledge". Thus semiology was condemned to be an extension of linguistics, rather than linguistics a branch of semiology as Saussure had originally envisaged (Harris, 1996, p.27).

Integrationism continues Saussure's original envisioning and refuses to make fixed boundaries between the linguistic and non-linguistic. An important difference however is that Integrational signs are "unique products of unique communication situations: they are neither the abstract invariants of Saussurean semiology, nor particular instantiations of such invariants"(Harris, 1995, p.22). Further the integrational sign is not Saussure's bipartite sign but instead is multi-dimensional, "treated as a complex of which any number of different facets may be identified, depending on the purpose of the analysis" (Harris, 1995, p.22).

For Harris "language must first conform to the basic order of our communicational universe before words can in any way contribute to articulating it, or assist us in dealing with what lies beyond it" (Harris, 1996, p.25). Thus, instead of making a verbal/non-verbal distinction the central issue for any sign, Harris proposes the integrationist sign which does not express concepts but instead articulates the integration of many different human activities and this is how the sign acquires its meaning (Harris, 2000a, p.57).

For Harris, "the meaning of a sign is its integrational function – not its capacity to represent anything else" (Harris, 2000a, p.57) and "a sign cannot exist except in some temporally circumscribed context. That contextualization is an indispensable condition of its very occurrence" (Harris, 1998b, p.12). As Pier explains, Harris's position is "in many ways the fruit of more than twenty years of research and publishing in the field of general linguistics" and emphasises the "contextuality, indeterminacy, creativity and non-autonomy of lan-

guage" to assert that a sign is a product of a situation rather than of pre-established codes (Pier, 1997, p. 134).

This means in practice that words, for example, mean different things depending on the different sequences of activities they integrate, although we are encouraged by metalinguistic devices, such as monolingual dictionaries to believe they are part of a fixed code.

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Thus Integrationism is a post-structuralist semiology of communication. It explains human communication as taking place through the contextualized integration of human activities by means of signs. But these signs are not Saussureanan bipartite units of signifier and signified, that is, dualist entities with form on one side and content on the other. In contrast, the meaning of the Integrationist sign is created solely through the context where the sign is being offered and the sign is "treated as a complex of which any number of different facets may be identified, depending on the purpose of the analysis" (Harris, 1995, p.22).

The two formal axioms of Integrational Semiology are:

- What constitutes a sign is not given independently of the situation in which it occurs or of its material manifestation in that situation.
- The value of a sign (i.e. its signification) is a function of the integrational proficiency which its identification and interpretation presuppose (Harris, 1998b, p.4).

In Integrationism, the creation of meaning has three interlinked characteristics:

- the *biomechanical*, broadly speaking, the physical and physiological aspects;
- the *macrosocial*, broadly speaking, the sociocultural aspects; and
- the *circumstantial*, that is the particular situation under consideration.

Harris explains the combination of these aspects in the following way: "[a] sign is integrational in the sense that it typically involves the contextualized application of biomechanical skills within a certain macrosocial framework, thereby contributing to the integration of activities which would otherwise remain unintegrated" (Harris, 1995, p.23).

Integrationism is extremely difficult to summarise briefly because, as we have seen, it challenges fundamental ideas (or assumptions) about the way humans communicate and create meaning and can thus seem counter-intuitive. When asked for a very short summary, Harris gave as a final principle "context before code" (Harris, 2000d). But even with this summary, it is important to stress that the Integrationist meaning of context is not the usual sense of a setting or local backdrop, an optional extra. Instead, for Integrationism, context is "always the product of contextualization and each of us contextualizes in our own way ... as a function of the integrational proficiency each exercises in that situation" (Harris, 1998b, p.12).

When applied to the analysis of writing, the key issues and concepts reconceptualized by Integrationism and that have proved fruitful for my work include the following:

- integration rather than representation
- spatial configurations
- the surface
- cotemporality and formation, processing and interpretation
- meaning and reciprocal presupposition
- typologies of written signs and writing systems
- books, signatures and mathematics.

3 The Integrationist view of writing

Integration rather than representation

Harris was able to theorise beyond the dominant "writing represents speech" model by recognizing that human communication takes place through signs but that little is explained by asking what these signs represent. Instead, Harris begins by studying the *activities* that are integrated by writing as a form of communication. Piers observed that Harris's work on writing is

> an ambitious and pathbreaking attempt to outline a semiology of writing aimed at identifying those factors that enable us to see writing, not as a pale derivative of speech, but as a distinct form of human communication ... to account for the actual and possible forms of writing through an investigation of various configurations of the relevant linguistic and nonlinguistic features (Pier, 1997, p.134).

Harris's detailed and practical analysis is the only analysis of writing that starts by clearly specifying the model of human communication that it assumes (Harris, 1995, Harris, 2000b). Thus, it provides a foundation for the new science of writing sought by theorists such as Kristeva (1989). And it includes, as an inseparable part of its theoretical investigation, the "nonlinguistic" visual–spatial aspects of writing that Kristeva recognized as being important for this science.

As mentioned previously, discussion of the visual and spatial aspects of writing is usually omitted from theories of writing and linguistic signs and instead exiled into disciplines such as art, typography and graphic design. However, for Harris, these visual–spatial aspects of writing are crucially important for the creation of semiological meaning through the activities integrated by writing. This is true not only for so-called "semasiographs", but for all kinds of writing.

Spatial configurations

According to Harris there may never be a simple explanation of writing (Harris, 1995, p.12). As we have seen, he refuses to make alphabetic writing the paradigm case and argues that the conventional view of writing "confuses the function of the written sign with just one of its possible uses" (Harris, 1995, p.7). For Harris, writing is a

form of communication that utilises *non-kinetic spatial configurations* to integrate the biomechanically diverse activities of reading and writing and this "contextualized integration relies in the great majority of cases on a visual framework and visual analogies" (Harris, 2000b, p.83). In fact, for Harris, the "foundation of all writing is the human capacity to recognize and exploit analogies" (Harris, 1995, p.174), an example of which are the subtle analogies of height, width, proportion, and so on, that connect members of a font family together.

For Harris, writing shares many features with painting and drawing because they all exploit the same basic resource: *spatial relations* (Harris, 1995, p.48). Writing and pictures comfortably coexist. A graphic space can be shared by both writing and pictures and the two may also be semiologically related through sharing it (for example, a photo caption). A graphic sign itself can be at the same time both a pictorial and a scriptorial sign, for example the first letter of an illuminated manuscript. Distinguishing between writing and drawing involves studying the macrosocial and biomechanical factors of the activities that are integrated (Harris, 1995, p.48). Harris does not "seek to arbitrate" on the use of the term *writing* as he is more interested in "studying the semiological mechanisms of certain forms of communication" (Harris, 1995, p.71). However, in distinguishing writing from drawing he has noted that "[w]hat characterises writing is that you have to process the signs in a specific order, not at random" (Harris, 1998a, p.122).

The surface

Harris emphasised the crucial role that the surface plays for writing. In writing a letter, for example, the sheet of paper provides both "a material support and also a frame" for the creation of new spatial configuration (Harris, 1998a, p.117). It is the surface that drives the "semiological wedge" between speech and writing because it has "no auditory equivalent" (Harris, 1995, p.115). Written signs can be combined on a surface in a way that is not a direct copy in visual terms of the way oral signs are combined in speech (Harris, 1995, p.114). This is true even for glottic writing, that is, writing that is integrated with speech communication (see typologies below). Harris gives the following example to show that the surface enables a graphic ambiguity that has no equivalence in speech (Harris, 1995, p.117).

CAESAR
KILLED
BRUTUS

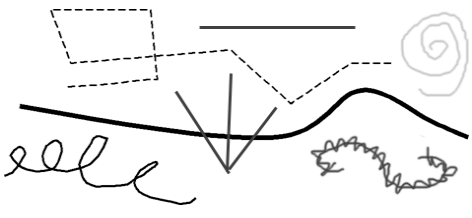
For Harris, the role of the surface creates one of the major distinctions between writing and speech. However, this is not to say that writing and speech cannot be closely linked. Harris points out that writing in Western culture has become specialised over the years to integrate speech communication. Thus a symbiotic relationship has developed between the two: a strong influence both of speech on writing and of writing on speech and this interrelationship is reflec-

ted in changes in both (Harris, 2000b, p.77). As discussed, Harris does not consider that even this kind of writing *represents* speech. According to Harris, we "misconstrue a complex of pedagogically inculcated practices as evidence of a representational relationship between speech and writing" (Harris, 1986, p.108). More importantly, this specialised kind of writing must not be made the paradigm case for writing in general because the deployment of graphic forms on a surface can create signs that are unique to writing (Harris, 1995, p.118).

The surface provides the basis for the two (and, sometimes, three) dimensional organization of graphic space and it is itself semiologically meaningful: messages cannot be written just anywhere (Harris, 1995, p.114). For the text situated in this graphic space, Harris distinguished between internal and external syntagmatics. External syntagmatics cover relationships between written forms and "items or events" outside of the graphic space, for example a road sign refers to something outside its graphic space.

Internal syntagmatics "relate … to the disposition of written forms relative to one another and to other forms within the same graphic space" (Harris, 1995, p.121). Writing operates by establishing relative, rather than absolute, positions and relationships between elements through variations in the analogies of direction of writing, horizontal and vertical alignment, proximity, size, inclination, colour, and so on. These contrasts affect the formation, processing and interpretation of the text (see cotemporality below). As an example, if the written forms within a space are to have internally syntagmatic relationships with each other, then the direction of writing is semiologically significant for those relationships. Another example is the meaningful subdivision of a graphic space, not by drawing boxes around elements, as in the ancient Sumerian clay tablet, but by the use of white space and variations in size, colour, font, and so on.

Harris argues that it is a mistake to call alphabetic writing *linear* because linearity is being conflated with *alignment* and the semiological function of the surface is ignored altogether (Harris, 1995, p.115). The properties of speech are not those of a line which, as Klee also reminds us, can have a wide variety of forms (Klee, 1953).



Cotemporality, formation, processing and interpretation

A unique feature of Harris's view of writing is his attention, through the Integrationist principle of *cotemporality,* to the role of time. This principle states that human communication is "designed to integrate past, present and future activities" and that time is the primary axis along which for human beings the various senses are integrated (Harris, 1998a, p.119). Interestingly, Klee also refused to define the present in isolation, that is, to separate it from the past and the future (Klee, 1966).

It is easy to forget the role of time in written communication, particularly as the signs themselves are non-kinetic and are usually durable. However, Harris points out that time is semiologically very relevant. Communication has to be slow enough to work (think of sky-writing on a very windy day) and reading and writing take time.

Harris analyses reading and writing as being made up of three activities, although these are not "separate stages on some sort of conveyor belt along which 'the message' is passed" (Harris, 1995, p.65). These activities are

- formation;
- processing; and
- interpreting.

The activities by means of which a written form is formed can be as biomechanically different as handwriting, sky-writing, making a neon sign, using a typewriter or a word processor. Thus, the formation activity does not have to involve inscribing, tracing, marking or scoring a surface, it could involve creating spatial arrangements, as in a floral clock.

Processing refers to the activities by means of which a written form is examined for interpretation and involves recognizing graphic units and the patterns of organization (Harris, 1995, p.65).

For Harris, time is also relevant in that it is important to distinguish between kinetic signs such as speech and gesture, and static signs, such as writing. Because a spoken sign is a kinetic sign, we must rely on memory to reprocess it. In contrast, because a written sign is static, it enables multiple reprocessings that are *not* memory-dependent (Harris 1995, p.43). However, it is noticeable that the *formation* of the written sign is kinetic so that *this* activity cannot be reprocessed.

A division between static written signs and kinetic spoken signs is another fundamental difference between writing and speech for Harris. It was also echoed in my experience at the movies in Tunis. In Integrational terms I could not reprocess the dubbed kinetic voice-overs but I could reprocess the static written subtitles.

Meaning and reciprocal presupposition

For Harris reading and writing are independent (for example, it is possible to read without being able to write) but also interdependent. They are linked together by what Integrationism calls *reciprocal presupposition*: "the possibility of a later operation depends on the exe-

cution of an earlier operation, which in turn derives its significance from the anticipation of that possibility" (Harris, 1995, p.6).

Another distinguishing feature of Harris's approach is that he does not assume that writing and reading are made possible by the "prior existence" of written signs. Instead, he argues that written signs are actually the "communicational products" *created* by the integrated activities of writing and reading (Harris, 1995, p.7). Thus signification arises from context and not from membership of any invariant set of signs defined in advance.

As discussed, Integrational Semiology maintains that signs do not represent but, instead, integrate human activities. Obviously this does not mean that a sign does not mean anything, simply that it acquires meaning from the activities it integrates and that there is no abstract invariant of the sign that is "the same" from situation to situation. For Integrationism,

> meaning does not belong to linguistics forms.... [It] is made by participants as part of the process of communication ... There are no fixed meanings. There is nothing in language to provide us with a miraculous guarantee of the stability of meaning(s) over time, or even, from one moment to the next (Harris, 1998, p.13).

Thus a sign is not a sign until it is placed in a situation. This is difficult to imagine and I would argue that it provides a major conceptual stumbling block in trying to understand the Integrationist approach. Harris gives a helpful example:

> in everyday parlance the word *sign* often refers to a physical object, as for instance in the advice to [UK] motorists given in the Highway Code to place a "red warning sign (a reflecting triangle)" on the road at least 50 metres in front of a vehicle that has broken down. For the integrational theorist, the reflecting triangle does not become a sign until it is appropriately placed in a situation of the kind described. The same physical object – the red triangle – was not a sign during the time that it remained in the boot of the motorist's car in readiness for just such an emergency; nor, having once functioned as a sign will it continue to do so when the motorist eventually puts it back in the boot again and proceeds on the journey. The spatio-temporal continuity of the object is irrelevant to its semiological role (Harris, 1995, p.53).

Thus, for Harris, the written sign is not the same thing as the written form because "different activities of interpretation may confer different significations on the same set of marks" (Harris, 1995, p. 68). This idea is hard to grasp despite the example of the red triangle and it is difficult to extend to alphabetic writing. Our early education encouraged us to think that the question "What does *B* represent?" has a very simple answer. However the following examples suggest that

this is not a simple question and that *B* has no abstract invariant meaning that is the same from situation to situation.

	B refers to ... (assuming macrosocial understandings)
B 	Spoken name of English alphabetic letter
#33B1FF	Hexadecimal (base 16) number (the equivalent of decimal 11)
BATH	Pronunciation guide
☎1 800 BUY TV	Telephone key to press
B	Boron in the Periodic Table
B. My second point is ...	Numbering system
	Picture (in this context)

Typologies of written signs and writing systems

Harris points out that "our reliance on the ability to distinguish old from new permeates every aspect of our existence and our understanding of the world around us" (Harris, 1995, p.73). As has been discussed in Chapter One, for Harris emblems

> are signs which reflect recognition of "the same X again", while tokens are signs which reflect recognition of "another (different) X" (Harris, 1995, p.73).

The form of an emblem matters more than the form of a token because "the emblem has to identify the same X over and over again" (Harris, 1995, p.75).

Thus an emblem has a *fixed value*. It is identified with just one *X* (for example, a family, religion or company) and thus another emblem does not indicate another *X*, but the same *X* again. A *token* is the opposite: another token does indicate another *X*. Harris argues this distinction is important for the written sign and that a sign may also

function simultaneously as emblem and token, becoming what he calls a *duplex* sign. Money provides an example of duplex signs. You do not throw away a $10 note when you have one already, because the second note is a token and does not indicate the same $10 again but another $10. But you also know that a $10 note is not worth the same amount as a $100 note; that is, the notes are also emblems.

Graphic space makes duplex signs possible, such as in the following list:

PRYOR Sally
PRYOR Mark
PRYOR Jill

Here PRYOR is a duplex sign. It functions both as a token for the individuals involved and as an emblem for individuals with this family name.

In contrast, the following list records the same information:

PRYOR Sally
Mark
Jill

However here PRYOR is only an emblem and is not a duplex sign. This example illustrates that "the function of signs as emblem or token is connected with the overall organization of semiological space in a particular context" (Harris, 1995, p.78). For Harris duplex signs are of key importance in the syntagmatics of writing and that without them there would be no "musical scores, no mathematical equations and no novels" at least as we know them (Harris, 1995, p.79).

Harris has developed an alternative explanation of the *writing system* and its relation to systems of notation, such as the alphabet. For Harris a writing system "exists as a set of (typically macrosocial) practices associated with an inventory of written forms" (Harris, 1995, p.56).

Thus, as discussed, a written sign is not the same thing as a sequence of letters. The following example shows this: the words, although homographic, are different but the letters are not.

I like to chat to my friends
J'aime mon chat

For Harris, there are two writing systems in use here. He argues that, in contrast to a traditional view of writing, the alphabet is not a writing system at all but a *notation*. As Harris defines it, a notation is an "internally systematised collection of autonomous marks" and is an example of an *emblematic frame*, one of the most "basic structures in the domain of signs", with the following characteristics:

- Each member of the set has a specific form which sets it apart from all others in the set
- Between any two members there is either a relation of equivalence or a relation of priority. Thus every member has a determinate position with respect to all other members in the set.
- Membership of the set is closed (Harris, 2000b, p.106).

Another example of a notation is the set of so-called Arabic numerals. Thus the numbers below

51 (decimal)
1101 (binary)

utilise the same notation but not the same writing system. Similarly we have already observed that the notational letter B can form part of several writing systems, including hexadecimal (base 16) numbers. Harris explains the difference between a notation and a writing system by analogy:

> Just as a supply of metal discs of various shapes and sizes does not in itself constitute a currency system, even though it may provide the necessary material, so a notation does not in itself constitute a script, but may provide the basis for one (Harris, 2000b, p.96).

More radically, Harris maintains that

> the set of visual shapes typically employed in scripts (e.g. the letters *a,b,c* etc.) has as its primary function *not to "represent" anything at all*, but rather to establish the dimensions of a certain graphic space, within which a text can be placed and articulated (Harris, 2001a).

In terms of typologies of writing, different forms of writing and ways of organizing text arise from variations of the biomechanical, macrosocial and circumstantial parameters of the activities integrated. Typologies of writing thus emerge from this analysis rather than leading to it. Harris does distinguish between glottic and non-glottic scripts. The former are those "that are specifically designed to be integrated with speech communication" (Harris, 1998, p.116). A diagnostic indicator of glottic writing is that "[r]eading this sentence aloud would be a trivially easy task for millions of people; but impossible for anyone – even if literate – who knew no English" (Harris, 2000b, p.viii). As for non-glottic forms of writing Harris maintains that conventional terms such as "ideographic" writing lack "any well-founded semiological criteria" (Harris, 2000b, p.56) and are "hallucinatory artifacts produced by the imaginative eye of the beholder" (Harris, 2000b, p.160). This is an important clarification for a theory of the icon and I will return to it in Chapter Five.

However, Harris does not consider this glottic/non-glottic division to be central to typologies of writing. Instead, because of the implications for the processing of the text he argues that the ways "various kinds of writing utilise the graphic space available" is more important than whether the signs are to be "interpreted phonetically, logographically, musically etc" (Harris, 1995, p.63). This perspective reflects Harris's rejection of the fallacy of verbalism, as discussed, and

offers a quite different framework from conventional typologies of writing.

Harris makes another key semiological distinction between what he calls a *script* and a *chart* (Harris, 1995, p.93). In a script, graphic form is important, as we have seen. However, information can also be recorded without using a script. In a chart it is absolute location in space, rather than graphic form, that creates meaning. As an example, a bar code features these two types of sign adjacent to each other. One is more biomechanically appropriate for a machine while the other is more appropriate for a human being.

Musical notation is a form of non-glottic writing that combines the two semiological principles: the script, that is, relative graphic form, and the chart, that is, absolute spatial location.

Books, signatures and mathematics

Harris's view of typologies of writing is at odds with our everyday experience that a link with speech is a key distinction for writing. This is partly because, as mentioned, our conception of writing is powerfully shaped by the particular characteristics of the mechanically printed book. There is a sense that writing at its most basic or fundamental level is the glottic "grey text" of the book, where images are subordinate or absent altogether, and little attention has often been paid to the visual–spatial design. However, Harris points out that this is actually a very specific form of writing, and of all forms of writing, this is the "least context-bound and has the highest degree of autonomy" (Harris, 2000, p.83). A book can be read almost anywhere and, in terms of the relationship between writer and reader, almost anyhow.

For Harris, written communication is "a form of communication in which contextualized integration relies in the great majority of cases on a visual framework and visual analogies" (Harris, 2000, p.82–3). However, the book is "somewhat unusual ... in that it presupposes no particular visual framework, except — in certain cases — one that is provided by accompanying 'illustrations'"(Harris, 2000, p.83). Thus, the visual analogies that predominate in the printed book are internal and primarily relate to recognizing the emblematic configurations of the ink marks. The written text is made to supply its own context, but this is not the case for the written sign in general (Harris, 2000, p.83). The book can erroneously appear to be "self-sufficient", despite the fact that reading cannot take place in a "communicational vacuum", but only in a "specific communication situation" (Harris, 2000, p.84).

The signature is a glottic script, that is, it is integrated with speech communication, yet it draws attention to quite different aspects of writing. Its semiological significance is not fully explained by the linguistic information, that is, simply the name that it records (Harris, 1995, p.37). In fact, as Harris points out, there is no "speech act" corresponding to the signature (Harris, 1995, p.80).

this is not Paul Klee's signature

For Harris the signature is a paradigm case of the emblem. Each signature refers to the same signatory, that is, to the same person and is thus an emblem of that person. Another signature does not mean another person, but the same person again. The signature also reveals the importance to writing of the macrosocial, biomechanical and circumstantial integration of activities as it "lies at the convergence between a specific individual, the act of signing and a specific form" (Pier, 1997).

Mathematical writing is an example of non-glottic writing. As with musical notation, an in-depth discussion is beyond the scope of this analysis, but it is worth noting the different activities integrated by mathematical writing, for example, calculation. Harris points out that "mathematics could not have evolved to its modern state *without* writing ... [and that] ... mathematicians were the first thinkers who realised the enormous potential of writing *as writing*" (Harris, 1995, p.134–5). In this context we recall the invention of zero and its positional role as mentioned previously.

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In summary then, Harris's view of writing does not focus on what the signs of writing represent but rather on the way that they are non-kinetic spatial configurations macrosocially biomechanically and circumstantially integrating the activities of reading and writing. Harris draws attention to the roles of surface, space, time, presupposition and context and away from ideas of representation and "code". This view enables theorisation beyond the limitations of the "writing represents speech" approach and a clear differentiation between writing and speech, even when they are integrated in various types of glottic writing.

In a sense, Harris's approach is similar to the boy in the story of the emperor's new clothes because, as we have seen, he asks fundamental questions about the presuppositions underpinning theories of

communication, language and writing that others have considered too obvious even to mention. Taylor suggests that because of his writing style and arguments, Harris might be viewed as a sceptic who approaches any topic from the perspective of philosophy rather than that of linguistics (Taylor, 1997).

As we have seen, Harris's work on writing and Integrationism is articulated through a number of publications and is complex because it opposes what seem to be common sense ideas about communication, language and writing, particularly outside the contemporary disciplines of critical theory and linguistics. It requires that we too question assumptions that may have seemed to be intuitively correct and which keep "sneaking back" into our thinking. For me the most difficult of these assumptions to eradicate is the most basic one, the idea that communication takes place through the combination of a set of tools and their use in action.

However, Harris's view leads to a much broader and more theoretically grounded conception of the signs of writing than has previously been achieved and to the awareness that "writing can create its own forms of expression" (Harris, 2000b, p.225). This foundation is particularly required for the challenges provided by the relatively new combination of writing with human–computer interaction. As Harris observed in 1986, "the origin of writing must be linked to the future of writing in ways that bypass speech altogether" (Harris, 1986, Epilogue).

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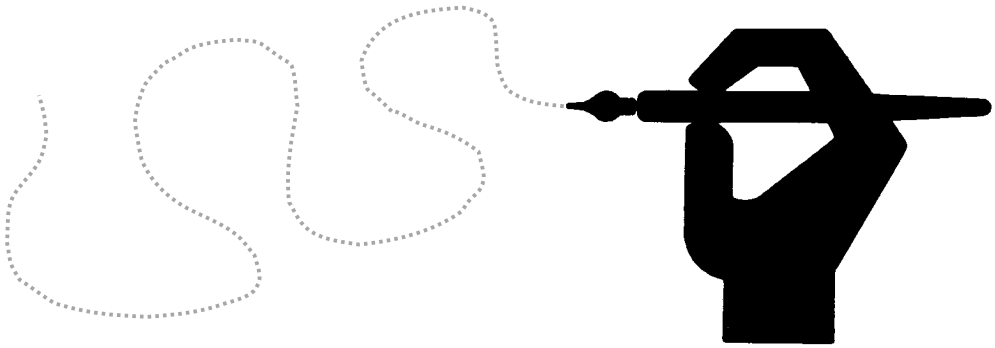
At this point it is worth mentioning that there do appear, at least superficially, to be points of overlap between Harris's Integrationist approach to writing and a Derridean view. For example, both theorists criticise the privileging of speech and reject the view of writing as (linear) representation of speech. An intriguing connection is provided by the comparison of Derrida's *gram* as "both a structure and a movement", as explained by Kristeva (Kristeva, 1989, p.332) and Wolf's explanation that

> the integrational sign integrates in two senses, "passive" and "active": (i) it itself is an integral part of the communicational context, and (ii) it brings aspects of the communicational context together (Wolf, 1999, p.27).

However a full analysis of the relationship between these two theories is well beyond the scope of this thesis.

I have concentrated on Harris's rather than Derrida's approach in my work. This is because in addition to showing why a conventional approach to writing is inadequate, it provides a solid theoretical foundation not only for an alternative approach to writing but also for the combination of writing with pictorial and auditory signs. This is particularly required for work involving the elements and activities of the human–computer interface and for any subsequent analysis of the computer icon. As Harris has put it

Derrida stands traditional wisdom on its head by treating speech as a form of (invisible) writing instead of writing as a form of visible speech. But, although arresting, this inversion is far less radical than it initially appears, for Derrida offers no alternative account of human communication, whereas integrationism does (Harris, in Salomon, 2001).



Chapter Three
Postcards and Tunis

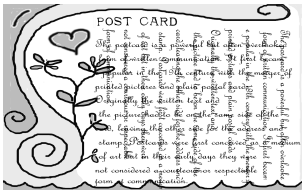
This chapter will outline the background to my research and experimentation with writing and HCI, which was executed in the production of an interactive multimedia artwork, *Postcard From Tunis*. [2]

Postcard From Tunis was designed as an artistic investigation of writing, set in a Tunisian context and exploring transformations of writing made possible by HCI. Rather than an abstract, disembodied work about dry theoretical concepts, it was designed as a sensual artwork, set firmly in the context of a personal portrait of Tunis.

1 Why a postcard?

> A little card will suggest what we cannot put into words (Meadows, 1900, cited in Carline, 1971).

The postcard is a powerful but often overlooked form of written communication. It first became popular in the 19th century with the merger of printed pictures and plain postal cards (Carline, 1971). Originally the written text and the picture had to be on the same side of the card, leaving the other side for the address and stamp. Interestingly this meant that writers sometimes used the Victorian technique of writing in two directions on the same page.



Postcards were first conceived as a medium of art but in their early days they were not considered a courteous or respectable form of communication. Fears were expressed about the loss of the art of letter writing (Carline, 1971). This fear of changes to literacy is common for new forms of communication, for example, early concerns about writing itself and contemporary concerns about the influence of television and computers.

The quote above about the ability of postcards to transcend some of the limitations of speech is actually an etiquette tip from *The Girls Realm* by Miss Margaret Meadows (cited by Carline, 1971) and it is a key theme for *Postcard From Tunis*. The quote also draws attention to the major virtues of the postcard: its small scale, its victory over wordiness and its assistance to the word-shy through the communicative power of images.

Today the postcard seems a rather commonplace and conventional tourist object: a "ubiquitous and popular form of communication and a natural symbol for world-wide travel" (Thompson and Daven-

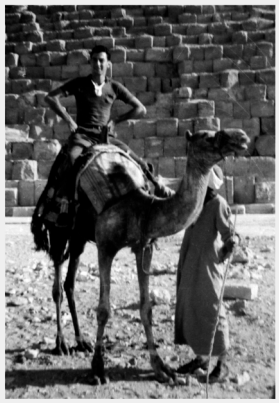
[2] Available as a CD-ROM from www.sallypryor.com/thesis.html.

port, 1980). However, it has played a variety of different personal, social and political roles in various macrosocial contexts over the years and these are not at all limited to the communication of travel experiences. In the future, it is conceivable that postcards may be replaced altogether by new forms of electronic communication, such as email and web "postcards".

Today's standard postcard is usually considered somewhat banal and its images not especially artistic. However, in Integrational terms, no image is a "representation of reality", rather its meaning comes from the contextualized activities it integrates and this is likewise true of the postcard.

From a different perspective Legrady observes that

> Postcards, being a condensation of cultural expectations and beliefs are ideologically charged. They are coded expressions of how the culture that produces them looks at the world ... coded representations of the possible and the impossible ... traces whose meanings are revealed over time, allowing the ideological narratives and semiotic coding to rise to the surface (Legrady, 1995).



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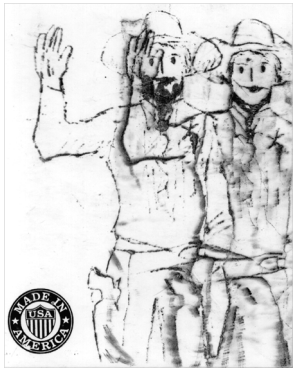
I have always loved postcards. For me they refer to travel and experience in (usually) interesting places. They are compact, expressive, succinct (both in image and text), visually attractive, tactile and easily displayed. As a child I treasured a postcard (reproduced above) that was sent by my uncle and showed him in front of the pyramids of Cairo. It probably influenced my subsequent decisions to travel in the Middle East.

As an adult I've sent many postcards, conventional and otherwise, particularly when travelling or living away from home. In the 1980s I lived in the USA and frequently expressed my impressions of America as handmade postcards: collages of drawings, found images, texts, ephemera, photocopied material, rubber stamps and very early computer-generated prints.



I began to make artists' books in America and also became involved with mail art by sending one of my handmade postcards to a show advertised in the periodical *Rubber Stamp Madness*. As a result of this act, my address was added to the list that all participants received and I began to receive and send work to mail art shows and people I had never met, in a number of different countries.

Mail art is a significant art movement in it own right. Held (1996) defines it as art sent through the postal network rather than displayed or sold in the conventional commercial outlets such as galleries, and as encompassing a variety of media including postcards, books, photocopy images, rubber stamps and artists' stamps. The most popular of all mail art media is the postcard, which can actually be considered the symbol of the field (Crane and Stofflet, 1984).

Crane and Stofflet explain that a mail art postcard differs from an ordinary postcard in its content and in the materials used. Mail art postcards often have non-traditional imagery and unconventional combinations of images and text: a "fusion and creation of new semantic-visual creatures" (Crane and Stofflet, 1984, p.29). This style is influenced by the typography of earlier artists, such as Kurt Schwitters and the Dadaists. The materials used can be unconventional too, such as wood, fabric and printed materials not intended for postal use. From my experience I would add that a mail art postcard also differs from an ordinary postcard in that the addressee may be known to the artist, may be known but never met in person, or may be completely unknown.

Mail art thus "incorporates interaction between and among active and passive participants ... an alternative activity that some consider avant garde" (geORge, 1980). Interestingly, the variety of the relationships possible between the artist and the addressee shares characteristics with subsequent emergent forms of email communication, such as personal correspondence, email marketing, discussion groups, and so on.

بالبريد الجوي
BY AIR MAIL
PAR AVION

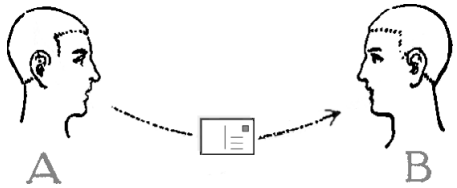
My prior involvement with Mail art postcards thus inspired my approach to creating *Postcard From Tunis*. There were other artistic influences. Over the same period of time that I had made postcards, I also made digital prints of screen-based images. The (sometimes tragic) difference in aesthetics between an image on the screen and its printed version is well known and is due in large part to the characteristics of paper-based (subtractive colour) systems compared with screen-based (additive colour) systems. In *Postcard* I made the unique light-based aesthetic of the screen, what I call *the pleasure of the pixel*, a fundamental part of the work itself and created intense, jewel-like colours designed to be viewed on a monitor.

Another strong influence on the creation of *Postcard* was my desire to combine my technical and computer programming skills together with my research and art practice, that is, to create an artwork within which they are integrated and influence each other. Media theorist Friedrich Kittler observed that understanding today's culture requires knowledge of both a natural language and an artificial language (cited in Atkins, 2001). While I would question the terms *natural* and *artificial*, I would maintain that the combination of human language and computer programming language has the potential to create something quite innovative that is less limited by the assumptions made about either.

```
if ((getAt(gRollCntrs, num)) >0) AND (Roll.Nbr <> num) then
    if num =15 then
        set the castNum of sprite num to 35
    else ...
```

My long-standing interest in Arabic languages, cultures, music and dance – which dates from when I worked in Jordan in the mid 1970s – was another strong influence.

These influences all came together in the creation of *Postcard From Tunis*, an interactive exploration of writing set in a personal portrait of Tunis. The concept of the postcard also draws attention to the difference between transport and communication, that is, to the difference between a material form that literally does travel from sender to receiver and an Integrationist sign, which does not.

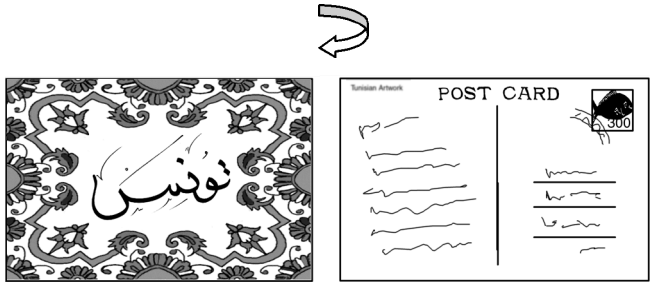


Thus, I chose the postcard as a theme:

- as a succinct writing space in which the pictorial element has traditionally been as important as the written text;
- to communicate my personal travel experiences in Tunis;
- to extend my previous work with Mail Art postcards into the digital and interactive domain;
- to refer to the Integrationist rejection of the sender–receiver model of human communication; and also
- to allude to Derrida's view of writing through a reference to his book, *The Post Card* (Derrida, 1987).

2 *Postcard From Tunis* as a postcard

The standard postcard today is a rectangular card, around 4"x 5", with its exact size, weight and appearance determined by postal regulations. One side has a visual image and the other is divided into spaces for the address of the recipient, the stamp (and postmark), the image caption and the text written by the sender. The latter is necessarily brief and typically of a personal nature, relating to travel of some kind.



The rectangular writing space of the standard postcard echoes one of its ancestors, the Sumerian clay tablet and is a static two-dimensional space in which there is a single handwritten text that is read in a sequence determined by the sender. The picture is on the opposite side to the text, so that the two cannot easily be seen at the same time. From an Integrational perspective, the relationship between them is thus one of external rather than internal syntagmatics. This relationship can be anything from a close one (for example, "loved this painting at the Louvre"), to no relationship at all.

Postcard From Tunis, shares some of the characteristics of a standard postcard. Its communicational style is personal and local, yet it is also international through the communication of travel experiences. Its small screen space echoes the writing space of the standard postcard. In fact this rectangle of screen, sharply defined against a black background, *becomes* a postcard although it is no longer portable like its traditional cousin. There are actually thirty-five different screens in *Postcard*, so there is also a parallel with a postcard wallet containing a number of different images on a folded strip.

The screen space of *Postcard* provides a site for the creation of an artwork. Like the small graphic space of the Mail Art postcard, in this space the "small format forces the artist to reduce the scale and economise" what is being expressed (Crane and Stofflet, 1984, p.26). With the first release of *Postcard*, (v1.0, the Macintosh-compatible

version), the actual CD itself was also designed as an art-object. As a Mail art experiment, I made a postcard out of a single CD and posted it to myself. It was successfully delivered.

The most obvious way that the communication space of *Postcard From Tunis* differs from that of a standard postcard is that in *Postcard* the picture and written text are brought together into one space and there is an auditory element. However, these differences are not startlingly new, as postcards have already combined images and texts together and various devices have occasionally been incorporated so that a postcard had, if not a soundtrack, then at least some music or sound effects.

The important and fundamental difference between *Postcard From Tunis* and a standard postcard is that, to use Bolter and Grusin's term, *Postcard* remediates the communicational space of the postcard (Bolter and Grusin, 1999); that is, it borrows from, pays homage to, critiques and refashions its predecessor (Bolter, 2001, p.24). *Postcard* is not a static written text syntagmatically linked to an image. Instead the whole communication space is transformed. *Postcard* is articulated through static and dynamic signs: written, pictorial, auditory and combinations of these. These signs are *created* by the user in a variety of sequences depending on the path chosen. This communication space becomes a "multidimensional array of signs" (Harris, 2001a) within which a number of new writing spaces are also articulated and integrated.

Through its audiovisual and interactive design, *Postcard* thus transforms both the *writing space* of the postcard and the nature of the *written sign* itself. Instead of the single static space of the standard postcard, *Postcard* has multiple, interrelated and dynamic writing spaces, each with different structures and ways of creating meaning. As will be discussed in Chapter Four, these spaces contain new written signs that are *kinetic*, *dynamic* and *reflexive*, their communicative power depending on the biomechanical skills and macrosocial understandings the audience brings to the work.

3 The foundation of *Postcard From Tunis*

By the time I began work on *Postcard From Tunis*, the importance of approaching the human–computer interface as a space that was dynamic and multi-dimensional, capable of integrating pictorial, scriptorial and auditory signs was clear. Harris's work had convinced me to abandon the idea of writing as representation of speech, even for glottic writing, that is, writing integrated with speech communication.

As discussed, I chose to combine my investigations into writing and HCI with a personal portrait of Tunis and its many ancient and modern written scripts. Thus, rather than trying to set an exploration of writing in an "abstract" context (which for Integrationism is impossible anyway), my exploration was set firmly in the emotional and geographical context of an artistic portrait of Tunis. As a result, the research process was integrated with the artistic production process

and the research outcome was the artwork, *Postcard From Tunis*, itself.

To provide a framework for both the investigation of writing and the portrait of Tunis, I returned to the concept of the *word*. This might seem like an unusual choice given what has been said in Chapter Two about challenging a verbalist approach to communication. However verbalism can also be challenged by probing everyday understandings of the word, that is, that a word is an abstract entity with the form of a *spoken* word, that it has an abstract invariant meaning or group of meanings (a belief promoted by the existence of metalinguistic apparatus such as the monolingual dictionary) and that a written word merely transcribes the spoken word.

The Integrationist view of the word is quite different as we have seen: "[w]ords for the integrationist are signs devised to facilitate the integration of whatever activities human beings engage in" (Harris, 2003, p.185). As discussed, the Integrationist sign is a multidimensional sign, not a bipartite sign, with a form on one side and a meaning on the other. There is no abstract invariant form or meaning of a word; it has no reality at all until it occurs in a context. The meaning of a word is created in any particular instance by the macrosocial, biomechanical and circumstantial aspects of the activities it integrates. As we have seen, for Harris the meaning of a word is created at each encounter with it in the same way as it is in the first encounter, although this is easily obscured.

This idea of the creation of meaning through the integration of activities is difficult to grasp and is more easily demonstrated in an encounter with a foreign language. It became clear to me when I lived in Tunis where I learned Arabic naturally rather than in a formal academic setting. An example was contained in the sound *SeMahNey* (my phonetic transcription) which, as discussed, was said when bumping into someone in the street. Its meaning for me was created through the activities it integrated and I later integrated it with similar activities myself. I did not need to find out whether it might be the equivalent of *sorry*, *oops*, *please excuse me* or even *what an idiot I am* (and so on), because, as Harris has pointed out, the search for meaning "stops when we have discovered how to integrate the occurrence of the word into enough of our linguistic experience to satisfy the requirement of the case" (Harris, 1998a, p.69).

Thus a central idea behind *Postcard From Tunis* was to recreate for a user this experience of the integration of activities. Through their interaction with my artwork, a user who does not speak Arabic is thus able to re-visit assumptions they might bring to familiar languages and to experience the Integrationist view of communication as the integration of activities, with no fixed boundaries between the linguistic and the non-linguistic. Thus, *Postcard From Tunis* is designed primarily for an audience for whom the Arabic language is unfamiliar.

Written Arabic	*Reasons for selection of the word*	*Written English equivalent*
تونس كتابه	The primary themes	Tunis writing
باب	Opening a door to: a city and culture the Arabic script ideas about writing The classic and beautiful Tunisian door	door
حوت	My Tunisian mother-in-law's greatest pleasure Linked to an ancient sign, still considered protective against the evil eye	fish
جمل	*Travel, commerce and colonization* The desert The indigenous Berbers Their ancient Libyan script, its modern version, Tifinagh The Arabic people generally	camel
فلوكه	*Travel, commerce and colonization* The Mediterranean sea The seafaring Phoenicians and the foundation of Carthage The Phoenician script	boat
قهوة	*Writing on packaging I often tried to read in Tunis* Traditional Arabic hospitality	coffee
كوكا كولا	*Writing on packaging* Contemporary Arabic hospitality Contemporary written sign, the logo Contemporary commerce and cultural colonization	Coca-Cola

I selected eight central Tunisian Arabic words – my understanding is that Tunisian Arabic has a distinctive accent and some unique words because it has been influenced by the language of the area's indigenous Berber people – to reflect the themes both of the personal portrait and of the investigation of writing. Six of these words were common nouns with fairly straightforward pictorial equivalents and two were proper nouns.

I designed a new communication space in *Postcard* whereby the activities integrated (looking, listening, moving and clicking the mouse) created static and dynamic signs. To make this possible, I

developed the communicational potential of the rollover, which seemed to have been strangely underexploited by other software developers at the time.

Rollovers are rarely mentioned in works on writing and HCI and their significance in the transformations by HCI of writing is usually overlooked in favour of the *hyperlink*. However I thought that rollovers had a powerful communicational potential.

Rollovers are also considered to be rather obvious, "the most intuitive and discoverable feature of any interactive title" (Bonime and Pohlmann, 1998, p.128). However, from an Integrational perspective they are not obvious at all and it is apparent that they require both biomechanical skills and macrosocial understandings. A user must know how to follow the location of the cursor on the screen with their eyes and to coordinate this with their movements of the mouse. I taught introductory computer skills to some eighty-something ladies in 2001 and was forcefully reminded that this is a biomechanical skill and it must actually be learned. Macrosocial understandings are also required to recognize the potential components of the screen that may provide a rollover response and how to stop this response by moving the cursor outside their perimeters.

As will be discussed in the following chapter, user rollover activities in *Postcard* create a variety of dynamic signs: various combinations of written, pictorial and auditory signs, that can also be dynamically reflexive. These signs transcend the distinction between verbal and non-verbal altogether, which Harris identifies as holding "the key to the development of writing as a form of human communication on the twenty-first century" (Harris, 2000a, p.61).

Thus, in *Postcard* none of the eight Arabic words is presented as having an abstract invariant form or meaning, that is, as a spoken word with an apparently fixed meaning established by (reflexive metalinguistic) reference to English or French words. In contrast, through the integration of the user activities of looking, listening, clicking or rollover, a word might be created as a auditory sign, a written sign, a pictorial sign or combinations of these. Pictures are not dominated by writing, as is so often the case, but instead the two are treated as complementary facets of one integrated form of communication. Speech, while also integrated, is de-centred from its usual, dominant position.

A user who cannot read Arabic is similarly able to re-visit assumptions they might bring to reading familiar scripts. *Postcard* draws attention to the Integrationist idea that written signs are created through communication, and, hence, offers a new exploration of writing for such a user. Once again, it might seem unusual to select a glottic script, that is, one integrated with human speech communication, when a key aim is to question the idea that writing represents human speech. However, just as the everyday understanding of the word is being probed in this work, so too is the everyday understanding that such writing *represents* human speech.

A major question in the development of *Postcard From Tunis* was whether it was possible to transform fundamental properties of the written sign itself: to create kinetic (rather than static) signs and dynamically reflexive signs that show readers how to read them, not in words but in writing itself. It is possible to imagine the creation of a paper-based writing space with writing that shows how to read it. However, this would be rather awkward. In contrast the communicative potential of the computer, particularly of rollover activities, coupled with an Integrationist theory of writing, has the potential to create new and quite unique writing spaces. These spaces can do something that ordinary writing simply cannot do, that is, they can show readers how to read them without using words.

This will all be discussed in detail in the following chapter.

4 A portrait of Tunis

The expressive and personal portrait within *Postcard From Tunis* is an inextricable part of the whole work and of its other achievements. In this section I will discuss what I was trying to express in the portrait. However, just as in everything else that I was trying to communicate, what a user actually experiences from the work will of course depend on the macrosocial, circumstantial and biomechanical aspects of the activities integrated. Each user will contextualize this in their own way and I simply cannot make a user *share* my experiences, no matter how well I express them.

Just as in an ordinary postcard, what I express describes my own experiences. But this is a multimedia postcard of what the experience of being in Tunis meant to me. And just as in an ordinary postcard, this is relatively brief: it is not *Letter from Tunis*, nor is it a documentary.

However, *Postcard* actually offers a more extensive and intimate portrait than an ordinary postcard ever could. Its interactive audiovisual design attempts to make the user feel as if they have been lucky enough to be invited into a Tunisian home, as I was. The style is poetic and offers an *experience* rather than *information* about Tunis. The soundtrack is also designed to echo the unique audio experience of actually being in Tunis.

Postcard is expressed firstly through the eight Arabic words that I selected because they stood out for me in the noise of the unfamiliar language and provided templates for more extensive engagement. These words and their multiple meanings form a core of the portrait and bring together historical and contemporary aspects of Tunisian culture and influences. They also provide an opportunity for the user to experience the Integrationist idea of there being no fixed boundaries between language and non-language.

However, *Postcard* also transcends words because it is also expressed through the different kinds of signs created when a user listens to, looks at, rolls over and clicks all the various elements in the work. The postcard is thus not limited to the communicative power of speech. It expresses things that I cannot easily say in words (such

as my feelings about Tunisian culture) and things that I choose not to say in words.

Through the selected stories, anecdotes, images, sounds and texts, *Postcard* opens a door to a culture that is not widely known in the West, except as the cheapest holiday in the sun for European tourists. *Postcard* reminds its audience that behind the tourist façade shown in the traditional postcard, there are real people and an ancient culture.

Postcard expresses my personal experience of love for the culture and is based around my own Tunisian family[3] and friends. Most of the soundtrack elements – children and adults talking and singing – are by members of the family and their friends. As I have already mentioned, my spoken French was not very strong and my spoken Arabic was minimal when I first visited Tunis. It was a humbling experience to appear unintelligent and lacking a sense of humour. I was treated with tolerance, generosity, warmth, and hospitality.

Visually *Postcard* does not feature the standard postcard images of tourist attractions or architecture (except for the beautiful Tunisian doors that, as an artist, I could not overlook). It features streetscapes, interiors and the primary theme of the written sign in many Tunisian forms and it explores aspects of the culture that characterised my visits to Tunis and my experiences. As an example, I was fascinated by the sign of the fish in a range of cultural contexts and I will return to this topic in the following chapter.

Postcard *and the aesthetics of presentation*

> Falsely naive, the postcard misleads in direct measure to the fact that it presents itself as having neither depth nor aesthetic pretensions. The colonial postcard is inseparable from that which occasioned its existence (Alloula, 1986).

In other words, the more a postcard is taken to be trivial, the more important it is to examine the conditions of its production. For example the colonial postcard can actually be a sign of colonial oppression.

In this context my postcard is a sign of something quite different – it is a personal sign of place in the abstraction of cyberspace, and it is a presentation of the local in the context of global flows of information and people. My postcard does claim some "depth and aesthetic pretensions" although, as mentioned, it is not intended as a historical, social, cultural or even personal documentary.

Rather than facts about Tunisia, *Postcard* merely offers an experience that encourages engagement with the culture and demonstrates its importance in the shared history of humanity and particularly, in the history of writing. Instead of the usual tourism rhetoric, *Postcard*

[3] My marriage to Faical Kosri, a Tunisian man, ended in 1999 but for simplicity I have not put *former* next to references to the family.

suggests the value of stopping for a moment to take stock of where you are and what you are doing and asserts the inestimable value of engagement with the people and culture of the place visited.

Postcard *and cross-cultural presentation*

Postcard cannot escape being a work of cultural anthropology because I am not Tunisian, however it is not intended as a work of formal anthropology at all. It makes no claims of objectivity: it is not a critique of Tunis and is not meant to be.

Is it a cross-cultural work? When I first completed it I thought that it might be, because it explored my own experience of crossing into Tunisian culture. However although the production of the work also had input from my husband and several Lebanese Australian musicians, fundamentally it is not a cross-cultural work because I speak about Tunisian people rather than collaborating in a process where they speak about themselves. An example is in Screen 5 (see the map in Appendix One for screen number references). In this screen the quote which is reproduced below (Tomkinson, 1992) was not made by a Tunisian person.

However, I did take care to have the final work viewed by a number of Tunisians, both in Tunis and elsewhere. They included my husband, members of my family-in-law, friends, government officials, computer and new media businesses and key staff (including the head) of the Agence Tunisienne de Communication Extérieure, the government body responsible for Tunisian public relations abroad. The response was positive, often extremely so and I made the small number of minor corrections that were suggested.

Presenting Islam

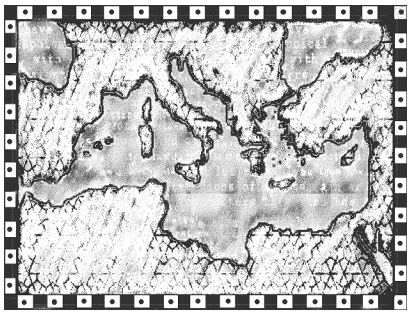
Screen 5 presents my Tunisian experience of Islam, once again in a non-didactic style. The screen is a soft-edged collage of photos and writing, including the quote above. These elements are juxtaposed with a soundtrack made of my recording in Tunis of the Islamic call to prayer (it says the equivalent of *God is Great*) followed by a piece of Islamic music sung by Lebanese Australian, Ghazi Nassouh. Rather than "spelling out" my impressions of Islam, I encourage users to integrate these elements together themselves.

Presenting gender

One aspect of *Postcard* arose from my naive effort to explore the complex perception of otherness as it relates to Tunisian women (Screen 16). In presenting the women in the CD-ROM I made choices determined by my attempt to focus on what women share (in

universal terms) by editing out the sign of difference (otherness) that many Westerners find in the veil.

The meaning of the veil for a Moslem culture such as Tunisia is a complex subject and is well beyond the scope of this thesis. I observed that, like many young Tunisian women, my sister-in-law rarely wore a veil. In contrast, I observed that her mother covered herself from head to toe when outside the house, leaving only her eyes visible. Inside the house, she rarely wore a veil. With approval, I presented her in *Postcard* as inside the house and unveiled, thus making her seem more accessible to a Western audience and expressing the way I best knew her (I had once walked right past her, veiled in the street, without recognizing her). However, this choice involved an element of "censoring" a Tunisian woman to make her acceptable to the West. It would have been much more effective to present her both with and without the veil, thus working against its perceived otherness for the West. It would have been more effective still to be part of a process where she spoke for herself, that is to have ascertained, for example, whether this difference was one she wanted others to notice, and to make my choices accordingly.



Maps and space

> When we look at a map, we attempt to extract the ordered and structured memories of others who have preceded us to that place or we try to derive some insight into the nature of a place which we match with what we experience there. In both instances then – as the memory of others, or as our own spatial predictions – maps are the projections of experience (Teib, 1983).

There are several maps offered in *Postcard*. The main point of entry is a map of the Mediterranean (Screen 28). Interestingly, as is clear above, it is impossible for a rectangular map of Europe to include Sicily in the south without also including Tunis and the Tunisian tip of the North African coast. However when I was at school, the North African region in such a map was either grey and unlabelled and or else removed altogether from the frame. The map I created for *Postcard* opposes this ethnocentric convention and does not divide the area into the boundaries of today's individual (post-colonialist) countries. The aim is to encourage reflection first on the way that the Mediterranean has historically connected Europe, the Middle East

and North Africa and also on the way these influences come together in Tunis.

A map of downtown Tunis is also provided in Screen 9. Through the interactive audio landscape and the names on the map, it presents modern Tunis as subject to Arab, French, Italian and (more recently) American influences. A user can both play and inscribe this map as they move the cursor around it.

The maps can also be interpreted as an allusion to the idea of phonetics as a kind of sampling of (or imposition of a grid on) a stream of vocal sound. The relationship of map to territory is thus suggested to be analogous to the relationship of phonetics to speech. Or to put it another way, it is proposed that there is a correlational rather than representational relationship both between map and territory and between phonetic writing and speech.

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The following chapter is designed to be read after viewing *Postcard From Tunis* and will discuss its key achievements. A short tour of the work is outlined in Appendix Two.

However the central research outcome of my work is *Postcard* itself, an argument integrated with the eight Arabic words but also made without words. The text that you are reading is a thus commentary on this process and outcome, an exegesis of Postcard. In closing I again quote Paul Klee and what he has said about discussing his own artwork.

> Speaking here in the presence of my work, which should really *express itself in its own language*, I feel a little anxious as to whether I am justified in doing so and whether I shall be able to find the right approach.
>
> For, while as a painter I feel that I have in my possession the means of moving others in the same direction in which I myself am driven, I doubt whether I can give the same sure lead by the use of words alone.
>
> But I comfort myself with the thought that my words do not address themselves to you in isolation, but will complement and bring into focus the impressions, perhaps a little hazy, which you have already received from my pictures (my italics; Klee, 1966).

Chapter Four
The user interface as a spaceofcommunication in *Postcard From Tunis*

The main achievements of *Postcard From Tunis* are somewhat inseparable from each other. Broadly speaking, the first is the creation of a multi-dimensional communicational space within which are new writing spaces and new kinds of signs, including new written signs. The second is an artistic exploration of writing in its broadest senses set in the context of Tunisia. The third is the creation of *educational art* and the fourth is an expressive and personal portrait of Tunis.

The portrait of Tunis has been discussed in the previous chapter. This chapter discusses the remaining achievements and Appendix Three lists the exhibitions and prizes for *Postcard From Tunis*.

1 A multidimensional communication space

The communication space of *Postcard From Tunis* is a "multidimensional array of signs" (Harris, 2001a) made up of static and dynamic signs (scriptorial, pictorial, auditory and combinations of these) that are created by the user in a variety of sequences depending on the path they choose.

Within this space dynamic and interrelated writing spaces are also articulated, each with different structures and ways of creating meaning. These spaces contain new written signs that are kinetic, dynamic and reflexive, their communicative power depending on the biomechanical skills and macrosocial understandings the user brings to the work.

Postcard From Tunis starts with the Welcome screen (Screen 23) and returns to it if there is no interaction for ten minutes. This screen contains the written Arabic, English and French words equivalent to *welcome*. They are also traced by a screen cursor and I will return to the issue of this moving screen cursor later. Periodically, a child's voice says the Arabic equivalent of *Welcome to Tunis* over a soundtrack of simple drumming. A mouse-click leads to the introductory screen (Screen 22).

The spatial layout of the introductory screen follows the sentence patterns of speech: *Postcard From* تونس (Tunis) transforms into (picture of) *Door to* تونس (Tunis). Voiceovers and written English-French explain how to interact with the work. A mouse-click leads to the Map of the Mediterranean (*Screen 28*).

This and subsequent screens abandon a sentence-based spatial organisation and move into different organizations of space. These screens provide a new communication space formed by the integration of a range of different activities. Broadly speaking the first level of activity, Level A, involves the user looking at the screen and listening to the soundtrack. Level B adds the user moving the mouse and Level C adds the user clicking the mouse. For clarity in the following discussion, I have created the table below, however each level is also inextricably combined with the preceding level and cannot ultimately be separated. For example in Level B the characteristics of Level A are also always present.

	(	)
Audiovisual space	with movement of user's cursor	(with user mouse-click
		
		
		
		

Level A

A is the basic level. The user looks at and listens to the work but does not move or click the mouse. The activities integrated are thus visually scanning the screen and listening to the soundtrack.

This is a mixed space, combining writing, pictures and a soundtrack. The visual elements are combined together in a soft-edged, rather than slick, photorealist style. Sound is an integral part of *Postcard* and plays a large role in my attempt to create a sense of context and mood and the feeling of being inside a home, within family life. A considerable effort was made to create a continuous, high-quality stereo audio experience, combining Tunisian location recordings of sound effects, music, singing and speech with original music created by Lebanese musicians in Australia.

In Level A, the overall organization of the graphic space is pictorial, that is, there is no particular order in which the elements must be scanned and neither images nor written texts are prioritized. It is primarily a static space although there is a small amount of anima-

tion. However as Klee reminds us, this space also has a temporal dimension as it takes time to look at it (Naubert-Riser, 1990, p.21).

Almost all screens include written Arabic and a few include written English and/or French. Thus, there is a mixture of different types of writing within this graphic space. A user is assumed to be able to recognize the written English or French within this space and to scan these signs from the appropriate starting point and in the correct order. As we have seen, reading is *directed* scanning, that is, scanning according to rules.

A user who cannot read written Arabic is obliged to treat this writing differently. It may appear to be squiggles, traceries or curvy lines, especially as many individual letters are joined together. For such a user, this writing appears to be non-linguistic and pictorial.

There are of course variations of this perception amongst users, depending on the macrosocial understandings they bring to (or develop during) the work. A user may recognize the Arabic script (although in Integrationist terms they cannot process or interpret it). Perhaps they have had prior exposure to Arabic or can now interpret an internally syntagmatic link between adjacent written and pictorial signs sharing the same graphic space, such as in Screen 26 where the two graphic signs are adjacent:


حوت

All of the eight Word screens (see below) share this characteristic of combining, in the same graphic space, pictorial and scriptorial signs that are linked with the same word. However a user can only interpret these internally syntagmatic links if they have a prior macrosocial understanding that such connections between pictures and scripts are actually communicationally possible.

A user who can read written Arabic will naturally have a different experience of it. And in certain screens that contain particularly beautiful calligraphy (such as Screen 1 above), they may also perceive it as *both* pictorial and scriptorial, a state that Harris calls graphic syncretism (Harris, 1995, p.48).

There are other written scripts in this work that most readers will find unfamiliar and will not be able to read at all, that is, the ancient Libyan, the ancient Phoenician and the modern Tifinagh scripts (below).

Thus the perception of what is writing and what is not will differ between users. This is an important general point. *Postcard* illustrates

the Integrationist claim that there are no fixed boundaries between writing and pictures and that "[w]hat is 'in the text' and outside it will vary from reader to reader" (Harris, 1998, p.104).

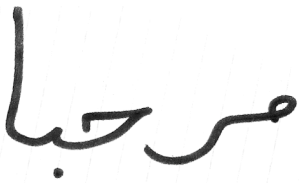
The moving screen cursor

A significant variation within Level A occurs in the screens that have a separate moving screen cursor that is *not* controlled by the user (Screens 1, 13, 14, 16 19, 20, 23, 26 and 28). This cursor continually traces the Arabic scripts from right to left, starting from the far right hand side.

The process was prefigured in the opening Welcome screen (Screen 23), where the screen cursor traced the written English from left to right, the written Arabic from right to left and a non-scriptorial line in both directions alternately.

As discussed in Chapter Two, Harris argues that a fundamental characteristic of the written sign is that while its formation is kinetic, the sign itself is static and hence it can be reprocessed. This contrasts with kinetic signs (such as vocal or gestural signs) which cannot be reprocessed without depending on memory. Once the static written sign has been formed however, it gives no indication of the kinetic process of its formation, so *that* cannot be reprocessed.

Simply looking at a written Arabic sign will not tell a non Arabic-literate reader the order of its formation. However, the moving screen cursor gives a clue: in Integrationist terms it traces (and exposes) the order of formation of the static written sign. Thus, what is created here through the combination of the kinetic cursor and the static written sign is a new kinetic written sign in which the formation *can* be re-processed. This may seem a small point but it is significant because a fundamental aspect of the written sign is transformed. This new written sign tells the reader how to start processing it, that is, where to start scanning and in what direction, and it does this without using words.



This does not presuppose the reader has knowledge of higher-order macrosocial conventions, such as those that must be assumed for the new written signs in Level B, such as the integration of script with speech communication (as mentioned) or of how that might take place, for example, the alphabetic principle.

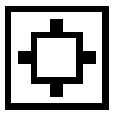
Level B, the rollover response

B is interlinked, as mentioned, with A, and arises from the addition of rollover activity, that is, when the user moves the mouse (usually by hand), resulting in on-screen movement of the user cursor and a variety of audiovisual responses. The activities integrated are visually scanning, listening to sound and moving the mouse.

As discussed in Chapter Three, the rollover response is usually ignored in discussions of writing and the computer, as it is considered rather obvious while, from an Integrationist perspective, it is not obvious at all.

In the generic rollover routine that I designed and programmed, the screen contains a number of active sites. When the user moves the cursor over an active site the following responses are integrated:

- the graphic (image or text) changes visually in some way;
- audio plays, for instance, a spoken Arabic word;
- the background sound track level drops; and
- the cursor changes to indicate that this location is also clickable.



I programmed the audio responses so that they play in different sound channels and usually do not stop playing when the cursor is moved beyond a rollover perimeter, that is, beyond the outside edge of an active site. Thus, as each screen has its own background sound composition, a user's rollover movements generate a unique soundtrack made up of these rollover responses montaged and collaged together and layered over the background composition.

In order to create a number of differently structured spaces, I modified the generic rollover routine by varying the four components and sometimes adding others. For example, in the Spell and Alphabet screens (see below), additional written signs also appear in response to rollover and thus create dynamically reflexive written signs. In these spaces there is a tight relationship between the audiovisual responses, for example written Arabic linked with spoken Arabic. In the Spell screens (see below), rollover sounds stop when the cursor is moved beyond a rollover perimeter. In other spaces there is a looser and more allusive relationship between the auditory and graphic components of the rollover responses.

This rollover functionality is very powerful. Neumark (2000) notes that

> [w]hen sound and image suddenly meet at the moment of the user's interaction, users can experience an intimate engagement and pleasure distinctive to CD-ROM.

My design enables a gestural and immersive experience and the real-time creation of collaged and montaged sounds, images and texts. A user can play *Postcard* as an audiovisual instrument by moving the cursor at different speeds or by rolling over the same site several times within a very short space of time. They can also leave visual

traces on several of the screens (*Screens 9* and *18*). Thus, the rollover response plays a major role in the unique interface, aesthetic and overall communication space of *Postcard*. And it is the rollover response that enables the creation of dynamic signs that combine, for example, *static* pictorial and *kinetic* auditory signs into one (Integrationist) sign, as will be discussed.

Note that when I first started making *Postcard* in 1994, rollovers were not widely used. Instead the mouse jockey user was the norm: someone who would click the mouse in rapid succession in order to experience a multimedia work. My design implemented rollovers when they were so unusual they had to be specifically programmed in the Director's lingo programming language. My decision to exploit and extend the underused communicative potential of the rollover involved programming the functionality myself, and also, warning the user in the opening screen (Screen 22) to browse before clicking. This is something you probably would not do in 2003, as the rollover is now well established and most respectable web sites feature a modest amount, even if it is only a cursor indication that an item is clickable.

Since 1994, more recent releases of Director offer rollover functionality as a standard. However even if I had created *Postcard* with a current release of Director, I would still program the rollovers myself. It would be a less technically demanding task but would still be essential in order to transcend one of the major limitations of art created with software, that is, that the design of a piece of software has a strong influence on what can be created with it. As Simon points out, "there are identifiable styles and artifacts that relate to the design and limits of software tools" (Atkins, 2001). I wrote original lingo programming language to create a unique interface of my own creation. This bringing together of my technical and artistic skills had the potential to create something more innovative than I could create using just one of these skills alone.

The space of words

There are eight specific Word Screens which, as mentioned, include pictorial, scriptorial and auditory signs for the same Arabic word in the same screen (Screens 12, 13, 14, 16, 17, 19, 20 and 26). A user can move through these eight screens by clicking >.

An example of the three types of signs is:

Pictorial	*Scriptorial*	*Auditory*
	فلوكه	fellooka (my phonetics)

A variation is Screen 24, which contains all eight written words, integrated only with corresponding spoken words.

In the space of words, speech is de-centred: an auditory sign plays only when the user rolls over a picture or written text. Thus, auditory components also create internally syntagmatic links between related

pictorial and scriptorial signs. For example, the two graphic signs below both trigger the rollover sound *hoot* (my phonetics), voiced differently by different speakers.

حوت

Writing and pictures are, thus, presented as complementary facets of one integrated form of communication. Additionally, as discussed in Chapter Two, an ordinary spoken word is a kinetic sign and thus any reprocessing of it must be memory dependent. However, in this space the kinetic vocal sign has also been transformed so that it can be reprocessed by simply initiating the rollover activity again.

However, a much more innovative kind of sign is created in this space: through rollover activity, modes of communication combine and form new kinds of signs, combinations of auditory and scriptorial or auditory and pictorial.

As has been discussed, a verbalist approach to communication assumes that signs behave like spoken words. Thus, because we cannot speak two words at the same time, we cannot invoke two signs at the same time and can only concatenate them one after the other, like spoken words. To explain what is actually happening here in *Postcard*, the dualist form-content sign must be replaced by the multidimensional Integrationist sign.

Thus, in *Postcard From Tunis* everyday assumptions about the concept of the *word* are also questioned. In Level B the eight words have no reality at all until they occur in a context. They are not presented as having the *form* of the spoken word. Instead, they may be created as pictorial, scriptorial, auditory, or as combinations of these. And it is this kind of combined sign that begins to transcend the distinction between verbal and non-verbal signs altogether.

The written words are not presented as the transcription of the spoken words, rather they are integrated with them. The eight words are not presented as having fixed meanings either; rather, the meaning comes from the activities integrated. This is reinforced by the relative lack of translation into English or French words, which might suggest fixed meanings even though, as has been discussed, in Integrationist terms this a reflexive metalinguistic illusion. The meanings of an auditory sign like *hoot* (my phonetics; the English equivalent is *fish*) might include:

- a favourite lunch option
- a powerful protector against harm
- 

or

- حوت

and so on, depending on the activities integrated.

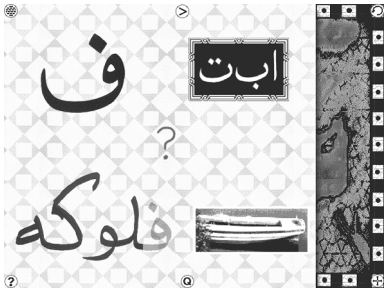
Level B thus makes new kinds of signs possible, and this creation presupposes that the user has higher order macrosocial understanding than those needed for the kinetic signs in level A. In level B, there

is a communicational presupposition that the user will understand the spoken noises to be words and that they are familiar with the integration of written and spoken signs.

However, as I understand it, we cannot really say that a previously non-Arabic literate user is suddenly reading a written word, for example:

فلوكه

Even though the user may recognise this as linked with a spoken word, that is, with *fellooka*, at this point the sign is somewhere between pictorial and scriptorial. It is integrated with speech in the same way as a pictorial sign, yet it does not appear to be a picture of anything. The moving screen cursor has suggested it is scanned from right to left, but the user has no idea whether there are any individual units within this. Visually scanning the sign reveals only two separate units of "squiggle" and a dot, all with white space around them. This is because in Arabic individual letters are joined together, in contrast to printed English where they (usually) are not. A solution to the problem of how to separate the script into units is offered in the new writing space of the Spell Space.



The space of spelling

There are eight Spelling screens, one for each word. In the map in Appendix One these screens are not numbered, but they can be reached by clicking the eight written Arabic signs in the map. A user can then move through these eight screens by clicking (>).

A variation of Spelling Space is the streetscape in Screen 4. The street sign for a shop named *Mary's* also rendered phonetically in Arabic.

As discussed, the Arabic script is read from right to left and comprised of alphabetic letters that are mostly joined together. To read very basic written Arabic, it must be understood that these letters take different forms depending on their position in a word. Arabic can also be called consonantal writing in that short vowels are indicated by vowel marks which are not usually written (except in children's books and the Holy Qur'an). Three alphabetic letters form the long vowels and they *are* written.

On first entering the Spelling Space, the entire written word highlights as the spoken word plays. Then, one at a time and moving right to left, the individual alphabetic letters (or combinations made up of

a consonant joined with a long vowel) highlight (and hence separate from the script) and the integrated pronunciation plays. At the same time, any vowel marks and the equivalent individual letter(s) are also displayed.

After this sequence, a similar set of activities is integrated whenever a user rolls over any part of the script. In this space there is thus a new kind of dynamic written sign with a *dynamic reflexivity*. Through rollover activity, this dynamic sign shows how to read it and, once again, this is done not in words but in writing itself. Neither shape nor sound is presented as having priority over the other, thus opposing, once again, the "writing represents speech" presupposition.

This dynamically reflexive sign presupposes the most high-order macrosocial understanding of all the new signs in *Postcard*, that is, an understanding of the alphabetic principle, although this is not explicitly acknowledged. Through this integration of rollover activities, the boundary a user experiences between writing and pictures has the potential to shift as they learn how to read these graphic signs.

The reflexive and dynamic signs are supplemented by an explanatory screen window that does use words and pictures. It is displayed when a user clicks ?.

The visual design of this space is influenced by Tunisian Arabic primers for children. The Spell Space also includes characteristics of the Space of Words (pictorial and auditory signs combined as one sign) and Alphabet Space (see below) within it.

Alphabet space

This rollover space (Screen 18) plays the names and shows the graphic variations of each member of the Arabic alphabet.

When the user moves the cursor over an alphabetic letter the rollover response integrates:

- playing the spoken name of the letter;
- displaying the different graphic versions of the written letter that depend on its position within a word; and
- displaying a large version of the letter which the reader can also trace.

The same explanatory screen window can be displayed when a user clicks ?.

Once again, a higher order macrosocial understanding of the alphabetic principle is presupposed in this space.

Early versions of this space featured a quiz. I removed this because its interaction style needed to be markedly different from that established for the rest of *Postcard*. There was also a recording of an Australian Lebanese girl rapping the Arabic alphabet while the screen displayed corresponding alphabetic letters. It was very successful but the recognisable backing track prevented me using it for copyright reasons. Attempts to re-create it were not as successful: the soundtrack to Screen 14 is the closest I could commission.

English–French space

As French is the second language of Tunisia, *Postcard* includes French translations of the few English texts included, in order to make the work accessible for a Tunisian audience. Rollovers integrate most French and English texts and provide a kind of written translation space, such as in Screen 5.

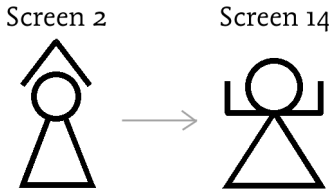
Level C, the hyperlink

Level C is formed by the addition of the hyperlink. The activities integrated are thus looking (spatial scanning), listening to sound, moving and clicking the mouse. This space presupposes the macrosocial understandings and biomechanical skills similar to that required for rollovers.

In this space the reader determines the order of the text to some extent by clicking on hyperlinks. This activity in computer space is the one most widely considered to transform traditional writing by making it nonlinear. However, from an Integrationist perspective, there are real questions about how linear traditional writing actually was to start with. I do not explore this issue in *Postcard* at all and have not set out to extend or transform the writing space provided by the hyperlink in any way. *Postcard* simply exploits the hyperlink's ability to make connections, that is, to produce a kind of montage or external syntagmatics between separate screens and hence the themes they explore. When the user clicks a hyperlink one of several drum sounds immediately plays. The intention was to make it possible for the user to feel as if they are playing a drum.

Each link in *Postcard* has been meaningfully designed. For example,

- clicking a written sign eventually takes users to its corresponding word and spell screens;
- clicking the woman who likes fish (in Screen 16) takes users to the Fish screen; and
- clicking the sign of the Phoenician goddess Tanit (Screen 2) takes users to the writing screen.



This is also an example of the non-didactic communication style of *Postcard*. The sign of Tanit is not identified in Screen 2 but a user may make a connection with the similar-looking sign on the inscribed stone that is labeled as Phoenician in the Screen 14.

However, these paths of meaning between screens are rendered less direct because, for technical reasons, I placed a separate image in between any two screens. I had chosen to use 8-bit graphics in order to reduce file sizes and hence improve performance of the CD-ROM.

This involved reducing the palette for each screen to two hundred and fifty-six separate colours. I was able to make this work because I was not trying to achieve a high resolution, slick aesthetic and I kept the sound at 16-bit because 8-bit sound is noticeably and inflexibly degraded.

However, when using 8-bit graphics and custom palettes, an ugly screen effect can result when a new palette is invoked while the old screen is still present. This effect is only avoided with a black and/or white screen.

I developed an alternative intermediary image that was coherent regardless of the screen palette. This image is frequently seen by the user as they wait for a new screen to display. To take advantage of the opportunity for the user to idly gaze at something "educational", I added the written word:

تونس

I added the Arabic letters making up this word, their English alphabetic equivalents, the *Khomsa* sign and the integer 5. The latter two are meaningfully connected, as will be described in the next section. These graphic signs all reflect key themes in *Postcard* and a user is repetitively exposed to them.

Navigation

The order of the screens in any interactive multimedia work is in control of the user only to the extent designed into the work and made possible by the authoring software itself. In *Postcard From Tunis* I created a specific style to reflect my relationship with Tunis and the way that I learned Arabic. This style was informed by the Situationnist idea of *dérive*, literally a "drift", "an apparently aimless wandering that nonetheless reveals the psychic undercurrents of the city" (Hewison, 1990, p.27). The Situationists, an European avant-garde movement founded in 1957 proposed that

> persons during a certain period drop their usual motives for work and action, their relations, their work and leisure activities, and let themselves be drawn by the attractions of the terrain and the encounters they find there. The element of chance is less determinant than one might think: from the *dérive* point of view cities have a psychogeographical relief, with constant currents, fixed points and vortexes, which strongly discourage entry or exit from certain zones (Internationale Situationnist No.2, as quoted in Hewison, 1990).

This text above is itself graphically blended within the opening Welcome screen, (Screen 23), although only small portions of it are legible. It very much characterised my experience in Tunis. Thus the navigation of *Postcard* was designed to echo this experience and there are multiple paths through the work that are analogous to this idea of constant currents, fixed points and vortexes. Hence I did not encourage the user to feel that they had *agency,* described as "things don't just 'turn out'; I make them happen" (Richardson, 1992, p.132). In fact, the user keeps coming back to screens that have already been visited. This was deliberate, an exploration of the *pleasure of repetition* but always in a new Integrational context. This repetition also offered users the opportunity to learn some Arabic by being repeated exposed to the eight core words.

However, one finding is that I should have given some indication on hyperlinks of whether they would lead to screens already visited. There are many user who just want to quickly "see it all", especially at exhibitions that include a number of different interactive works to view. Such a user is forced to navigate via the global navigation button on the top left hand side of every screen

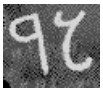
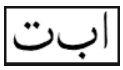
and which leads to a screen that *does* indicate all the screens that have been visited.

Another issue is that when users inevitably return to a screen they have visited before, it looks and sounds identical to their previous visit. There is no sense of progress, despite the fact that in Integrational terms the actual context is always different. I now think that there should have been some sort of change, both to the hyperlinks and to previously-visited screens, so that users can feel that they have left a trace on the work. An appropriate choice might be a rubber-stamped postmark and this is something to further explore in subsequent work.

A minor point is that I learned to make the Quit button more readily accessible for users and implemented this in version 2.0, the PC-compatible version.

Rollover and hyperlinks

As an example of the rollover and hyperlink activities designed into each screen, the components of Screen 28, the Map of the Mediterranean, are itemised in the table below. The soundtrack to this screen is a duet of Arabic drumming by Jamal Zraika and Faical Kosri, which was recorded in Sydney.

Screen item	*Visual response to Rollover activity*	*Audio response to Rollover activity*	*Screen reached by mouse click on item*
	becomes *Tunis*; moving screen cursor disappears	plays spoken word *Tunis*	Calligraphy and Pattern (Screen 1)
	becomes Arabic Stop sign	plays computer game sound	Quit movie (Screen 25)
	highlights, adds text: *credits*	plays drum beat	Credits (Screen 27)
	arrow appears and points to the location of Tunis	plays spoken word *Tunis*	Tunis and Islam (Screen 5)
	map fragment enlarges	plays street noise	Audio Walk Downtown (Screen 9)
	becomes picture of a camel	plays spoken word equivalent of *camel* in Arabic	Libyan (Screen 11)
	becomes picture of a boat	plays spoken word equivalent of *boat* in Arabic	Phoenician (Screen 7)
	spoken name of each alphabetic letter is played as the letter highlights		Arabic Alphabet (Screen 18)

These active sites are supplemented by the following global navigation buttons which appear on every screen. The user cursor changes form when it is rolled over any of them.


Go to map of the Mediterranean


Return to last screen


Go to global map of all screens


Go to Introductory screen


Quit

2 An exploration of writing

> Là est le lien fascinant entre le passé, le présent et l'avenir (Alif, 1988, p.3).

Postcard From Tunis is an artwork about writing that is expressed partly in writing. As we have just seen, it also transforms writing. It does this at a fundamental level, by transforming the static written sign into kinetic and dynamically reflexive signs.

As will be discussed in Chapter Five, Bolter (1991; 2001) characterises the writing space of the computer as a combination of intuitive pictures and abstract written text. This division implicitly assumes a verbalist view that pictures and writing are diametrically opposite forms of communication. In contrast *Postcard* demonstrates that there are actually no fixed boundaries and considerable overlap between pictures and writing, as they are both based on spatial configurations. The question of what is writing will differ from person to person and depend on the macrosocial, biomechanical and circumstantial aspects of the activities integrated. Thus, you cannot tell just by looking at a graphic sign whether it is writing or not, despite the assumption that the less "pictorial" a sign appears to be, the more likely it is to be a written script.

If we return to Klee's assertion in Chapter Two that writing and pictures are fundamentally identical and combine it with a related statement by the Dada artist Hugo Ball that "word and image are one" (cited in Spencer, 1982), we can now say that sometimes these statements are true.

Thus, *Postcard* offers a non Arabic-literate user the opportunity to re-visit the traditional assumption that writing is a representation of human speech. By exploring the encounter with a new script, such a user has the potential to see that rather then being fixed and given in advance, the meaning of a written sign is actually created at each encounter with it by means of the activities integrated. *Postcard* thus expresses the Integrationist idea of writing as spatial configurations integrating the past, present and future activities of formation, processing and interpretation. Through the emblematic frame provided

by the Arabic alphabet and in the context of *Postcard From Tunis*, the Arabic script is presented as integrated with the pronunciation of human speech communication, rather than representing it.

There is a further extremely important macrosocial dimension to the Arabic script. Arabic writing is considered sacred by Moslems because it is an expression of the word revealed by God (Alif, 1988). I respect this belief and the Islamic religion itself. *Postcard From Tunis* does not explore this important aspect of Arabic writing, partly because I felt that it was a significant topic in its own right and mainly because, although I respect this view, I do not know enough about Islam to be able to discuss it. *Postcard* deals only with the Arabic script in non-religious communicational contexts and explores the idea that written Arabic in such contexts integrates rather than represents human speech communication.

James adds that

> [f]or Muslim calligraphers, the act of writing – particularly the act of writing the Qur'an or any portion of it – was primarily a religious experience rather than an esthetic one. ... In the West, calligraphy has always been considered a minor art. In Islam its importance is paramount, absorbing the creative genius that, in the West, went into religious and secular painting, sculpture and music. The sacred nature of the Qur'an as the literal word of God, not a human document, gave the initial impetus to the great creative outburst of calligraphy which began in the seventh century and has maintained its momentum until now (James, 1989, p.17).

Screen 1 does however allude to the beauty and visual sophistication of Arabic calligraphy. This screen is very simple.

تونس (Tunis)

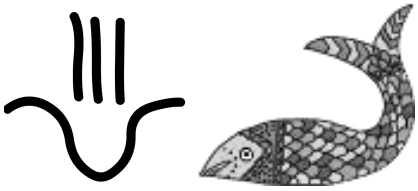
is written in the centre in an elegant calligraphic style, with vowel marks indicated (see Screen 21 for an explanation of vowel marks). The soundtrack is an approximation of Tunisian folkloric music made on a synthesiser by an Australian musician, John Zorzi.

تونس is surrounded by a repeating pattern modelled on tiles (above) from a Tunisian exhibition of Quallaline tiles produced between the sixteenth and late nineteenth century. Messaouidi points out that the ceramic tile is a cultural and aesthetic mark essential to the comprehension of the people who produce it and the catalogue cites Italian, Ottoman, Berber and Andalousian influences as contributing to the "melting pot" of cultural influences on this craft (Driba, 1995). This tile work can also be seen as part of a tradition of the reification of pattern, which arguably has a more expressive and communicative role as a result of the Islamic prohibition against representation of living beings. Skhiri has pointed out that this prohibition has also led the Tunisian craftsman to make the flower a principle source of inspiration, as it is in this pattern (Sethom et al, 1976, p.16).

01001010100010101011010101

Postcard From Tunis is an exploration of writing that is set in Tunis because, as discussed, this is a point of intersection of many ancient and modern writing cultures. It was also in Tunis that I first became aware of the complexity of writing and the seminal work of Roy Harris.

Postcard includes a number of Tunisian-based glottic scripts including modern Arabic, English and French, the ancient Phoenician, Libyan and the modern version of Libyan, Tifinagh. The Arabic texts (with the exception of one I made myself) were created by a Sydney-based calligrapher, Ahmed Ladkani.

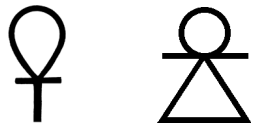


A particular exploration of writing is provided by the ancient symbols of the fish and the hand in Screen 16. In this screen the fish is shown as a contemporary sign with ancient roots and also as an everyday object. The screen combines photos of fish, an ancient Roman stone engraving, three intertwined fish drawn from traditional Tunisian jewellery and another Tunisian-style image of a fish. The soundtrack is a collage by Sharon Etter of Tunisian family and friends talking, playing drums, singing, "ululating" and laughing. Screen 17 also contributes to the exploration of the fish motif: an embroidered

fish is revealed on rollover activity, suggesting a link with women and domestic crafts.

The ancient graphic signs of the fish and the hand are widespread in Tunisia and are believed to possess the power to protect against the evil eye, sometimes explained as the damage jealousy can cause. Sethom points out in *Signes et symboles dans l'art populaire Tunisien* (1976) that the designs "decorating" items in daily Tunisian life (such as clothing, pottery, jewellery and furniture) reflect very ancient rural beliefs and superstitions. She explains that the motifs of the fish and of *khomsa* (called the Hand of Fatma by the West) have been charged with meaning for Tunisian culture since earliest times and can be traced to Palaeolithic times. She adds that these signs are considered beneficial although no one really knows why.

Sethom notes that the fish motif featured regularly in Roman iconography, while the hand was a symbol of Carthaginian divinity and linked with the Phoenician Goddess Tanit. Fantar (1995) links this goddess with the mother and the goddess Astarte. He notes the presence of the sign of Tanit at the threshold of a dwelling in Kerkouane (in Tunisia) as intended to oppose the forces of harm. Lancel points out that this sign can be linked with the hieroglyphic *ankh* and with images of the late Bronze Age goddess, although the development and chronology is unclear (Lancel, 1997, p. 203).



Sethom adds that the hand was also associated with the number 5 which some considered had additional powers including those arising from the graphic form of the Roman 5, V, which offers at the same time an angle and a point. Interestingly the Arabic word for the number 5 is *khamsa*, differing by a vowel from *khomsa*, a point to which I allude to in the intermediary screen image already discussed.

I also had more personal Tunisian experiences of the fish. Firstly my mother-in-law felt very strongly about fish, similar to the way others might feel about chocolate. Then there was a protective folk art style image of a fish next to the entrance to the family's home. And on the seventh day after I was married in Tunis, my husband's grandmother, a very traditional woman, supervised a process where my husband and I stepped over a plate containing a large fish seven times. I could not ask her about this because, although we were very fond of each other, we shared very little spoken language. I understood it was something to do with fertility, as Sethom in fact confirms, and had a strange sense of this ancient practice "hitting the wall" provided by my use of the contraceptive pill.

I chose not to further explore in *Postcard* the intriguing links of these ancient signs and practices to fertility, the Goddess Tanit and (perhaps) Earth Mother religions in general. I felt that it was a complex and sensitive topic that an outsider should not blunder into.

However as writing, the sign of the fish has an important contribution to offer. It is clearly an emblem and I also observed that, as Sethom confirms, the spoken name of the fish was considered as protective as the visual symbol itself, such that (in English) one would say "a fish on [someone]" to protect them against harm (Sethom et al, 1976, p.50).

This equivalence in power between the spoken name and the graphic sign echoes Harris's idea of an ancient concept of graphic isomorphism. As discussed in Chapter One, Harris proposed the example of a graphically isomorphous wolf sign that simultaneously "stands for" the totem animal and the name *wolf* as complementary aspects of the identity of the tribe. In this context there is no perceived separation between the pictorial and the scriptorial aspects of the sign and it reflects fundamentally different cultural attitudes compared with contemporary attitudes to names, distinctions between writing and pictures, and so on.

The equivalence in power between the graphic sign of the fish and the spoken name of the fish recalls the equivalence between the graphic sign of the wolf and the name *wolf* in Harris's wolf emblem. This suggests that what we would today call a pictorial sign of the fish may have also been considered a scriptorial sign in the past and is thus a fascinating remnant of the kind of ancient sign exemplified by Harris's wolf emblem. This suggests that Harris's non-traditional view that writing developed from an original state of graphic isomorphism in which there was no separation between the scriptorial and the pictorial, is at the very least a plausible account.

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Postcard artistically explores many other dimensions of writing: writing as trace, as inscription, as choreography in space and time, macrosocially connected with commerce, bureaucracy, education, colonialism and everyday life. Screen 1 also draws attention to the similarities between writing and pattern and the fact that, as Harris has pointed out, "writing, perplexing as it may seem, has no distinctively visual characteristics by which it may be identified" (Harris, 1986, p.17).

A general screen about writing is Screen 14. It includes Phoenician and Tifinagh scripts, children's writing, street signs (*Shoes* is rendered phonetically in Arabic), the envelope, the stamp and the postmark. The sign of Tanit appears adjacent to the Phoenician script.

Another version of the graphic sign of Tanit is in *Screen 2*. In this screen the soundtrack is a recording I made in Tunis of "trance music" called *stombeyli* (my phonetics), probably of West African origin. The rollover computer game sounds allusively suggest winning or losing some kind of contest.

In the Phoenician trading story in Screen 8, spatial configurations of gold suggest a link between cross-cultural trading and writing. In Screen 19, rollover activity on the moon causes it to progress through its various phases, creating a changing graphic sign in the sky. The artist Leandor Katz's *Lunar Typewriter* (1979) has linked these changes with writing by placing tiny photos of phases of the moon onto the keys of a typewriter.

Screen 15, writing in the sand, draws attention to an account I read in the British Council library in Tunis (I did not get bibliographic details). It discussed Tuareg children learning to read and write by watching their mother write in the sand and tracing the letters in the sand after her. These Berber peoples, contemporary descendants of the area's indigenous people (Pean, 1995) use a script, Tifinagh, derived from ancient Libyan (Alif, 1988). Pean points out that the Berbers "have always constituted, and still do the root stock of the people of the Maghreb [North Africa], despite wave after wave of immigration, especially in antiquity and medieval times" (Pean, 1995, preface).

In Screen 10 the order of formation of Tifinagh is traced right to left and top to bottom by a moving screen cursor. An analogy is suggested between the written story about a dog and a bone and the scanning (and influence) of a TV set. This story was written in Tifinagh and translated in Jensen (1970). In the story a strong object (the bone) is vulnerable to the dog because the dog can spend a great deal of time conquering it, rather like water dripping on a rock. This story can be interpreted as a metaphor for many kinds of gradual change, including cultural colonizations.

"Coca Cola and The Dynamic Ribbon device are registered trademarks of the Coca-Cola Company"

Screen 20 draws attention to the complexity of a contemporary written sign: the logo or trademark. In Integrationist terms this graphic sign would be considered an emblem and interestingly it is also graphically isomorphic, that is, it is both pictorial and scriptorial. It is written in a glottic script, but like the signature (see Chapter Two), its semiological significance is not fully explained by the linguistic information, that is, the name *Coca-Cola* that it records. A great deal of money has been spent to associate it with young attractive people sharing good times together. Its graphic style is inseparable from these meanings and hence versions of the Coca-Cola logo in other scripts (such as the Arabic version here) are linked by visual analogies to the American version.

I applied for formal permission to use the Coca Cola trademark and was required to insert the legal wording re-printed above. I was

happy to do so, especially as it also drew attention to patenting of the non-glottic graphic sign, the so-called *dynamic ribbon device*.

Homage to Paul Klee

> The many European painters who had travelled to North Africa in the previous century had seen themselves mainly as chroniclers of a fierce and romantic life, to be captured on canvas with all the skill their western narrative technique could command. [In contrast] Klee had already decided that painting is made from paint, not from narrative, and that colours are to painters what sounds are to musicians (Hall, 1992, p.4).

Screen 3 is an original image that refers to the painting *Signs in Yellow* (1937) by the artist Paul Klee (1879–1940), some of whose ideas have been mentioned previously. Klee was strongly influenced by visiting Tunisia in 1914, where he experienced a deep feeling of connection and well-being and wondered "Could this be my homeland?" (Naubert-Riser, 1990).

It is well known that the "light and tonalities" Klee discovered in Tunisia transformed the way he perceived colour, leading him to declare in Kairouan, "Colour and I will always be as one" (Naubert-Riser, 1990). Interestingly Harris has proposed that the *semiological role* of colour arguably provides one of the major differences between writing and painting. Harris pointed out that in written texts

> colour analogies are predominantly used as a means of emphasising what is also articulated in terms of spatial relations, and rarely provide an independent dimension of signification (Harris, 1995, p.176).

This is in contrast to painting where colour often does provide an independent dimension of signification. A full analysis of this idea and of Klee's work in general is beyond the scope of this thesis. However it is worth also noting that Klee developed extremely sophisticated graphic forms and spatial configurations, with internally syntagmatic relationships created through many of the same spatial resources (such as variation of line, tone, colour, alignment, proximity, and so on) as are deployed in writing. He created paintings in which, according to Hall,

> the whole surface is alive with possibilities, as our eye seeks to relate these graphic marks to one another, or to complete in the imagination the relationship that Klee has already suggested ... [and the] existence of so many presences haunting the surface (Hall, 1992, p.40).

Hall adds that

> Whenever lines come close to one another but do not touch, energy is created … The animation that comes from this source permits an astonishing number of ambiguous forms to exist independently within the picture, each signalling its existence but in perfect harmony (Hall, 1992, p.42).

There is a great deal of play and overlap in Klee's work between pictorial and scriptorial signs. It is less well known that Klee's visit to Tunisia, like my own, transformed the way he expressed graphic signs, influencing his subsequent development of a personal calligraphy in which, as previously mentioned, he felt that writing and drawing were fundamentally identical. Duvignaud (1980) has argued that Klee was sensitive to the "lost languages" of Tunisia expressed, but no longer fully decipherable, in tattoos, jewellery, clothing, everyday objects, architecture (such as Tunisian doors), tiles, graffiti, manuscripts, and so on. This connects with my own experience. Screen 3 draws attention to this idea when user rollover activity transforms my version of Klee's *Signs in Yellow*.

One further point is that naturally Klee was influenced by his experience of the Arabic script and Screen 3 also draws attention to this. Viewers of his paintings who are unaware of this may well miss visual puns, such as in the fragment recreated below of his painting *Intention* (1939) which I have juxtaposed with the Arabic letter *baa*.

ب

Note that it is impossible for me to also render above the effect Klee created in the pale areas around the figure where the underlying newsprint surface "leaks" through.

3 Educational art

Postcard From Tunis is designed so that, just as during an actual visit to Tunis, a user might pick up a few spoken words and possibly, learn to read them in Arabic. *Postcard* is thus a unique blend of art and instruction, a kind of educational art. However the philosophical orientation and pedagogy comes from artistic exploration rather than from investigation of new ways to teach or learn language.

My primary intention was to develop a more elaborate understanding of the nature of the written sign and how it might be transformed in the space provided by the computer. This was combined with the intention of offering the user an experience resem-

bling my personal language learning experiences in Tunis, which I found involved the integration of activities.

I also wanted to create an alternative to static and silent printed textbooks. When previously trying to read Arabic, I had wanted to hear the spoken names of seemingly similar alphabetic letters and to see all the different graphic forms they took. I had wanted to "unpack" a written form into its constituent letters and pronunciations. I created tools in *Postcard* to do these things. However, the manner of presentation invokes the Integrationist idea that, just as it is impossible to separate a language and its use, it is impossible to separate these tools and their use.

The experience I offer in *Postcard* is designed, through its interaction style and soundtrack, to feel natural, as though it is happening comfortably and in the context of the home or the street, rather than formally at school. It is mediated through the activities integrated in the new communicational space discussed in Section 1.

In Tunis I had found it fascinating that in the process of everyday interaction and context, previously foreign sounds would seem to gradually emerge from the soundscape for me. After several repetitions, they might become recognisable noises that I could remember. I would deduce meanings from the activities integrated, such as bumping into people in the street (as discussed) or through metalinguistic inquiry, by asking "What does [noise] mean?"

Likewise, the relatively foreign Arabic script looked to me like a beautiful squiggle at first. It was a joyful experience to recognize for example that the graphic sign,

تونس

was linked with a spoken word that I knew. It was fascinating to be able to separate it into graphic units and to integrate these with pronunciations. Note that, as discussed, there is an important difference between a pronunciation guide and a representation.

I wanted to offer an experience of this to an audience who cannot read or speak Arabic. Thus, the eight Arabic words were interleaved in various combinations of auditory, pictorial and written signs. I rarely linked them with English (or French), so that a user was put in a similar situation to that of an actual visit to Tunis. As the user moves through the work, rollover activities mean that they are repeatedly and unintentionally exposed to these signs in various contexts.

As discussed in Chapter Two, from an Integrationist perspective, a sign is created for the reader through the integration of activities which have macrosocial, biomechanical and circumstantial dimensions. Harris has pointed out that what is "in the text" and outside it will differ from person to person. He adds that

> this differs even from one occasion of reading to the next if, in the interim, the reader has acquired more information, or certain points have meanwhile "sunk in" ... the text itself is not a stable entity. We construct our texts as we go: they are not given in advance of the operations by which we contextualize them (Harris, 1998a, p.104).

Thus, this creation of signs has the potential to change even within one session of viewing of *Postcard* because of the multiple rollover-mediated exposures to combinations of spoken, visual and written signs. The context changes as the user experiences repetitions and begins to make connections. The user is actually also learning some of the macrosocial conventions required to speak and read Arabic. However, they are learning them through the integration of activities rather than as a set of rules that are given in advance and, as Harris puts it, expected to "explain and delimit in advance what it is possible for a sign to signify" (Harris, 1996, p.245).

Perceived boundaries between the linguistic and the non-linguistic thus have the potential to change within a user session. The extent to which this actually happens depends, as discussed, on the biomechanical skills and macrosocial understandings a user brings to the work and the length of time they spend with it. They cannot avoid the moving screen cursor, thus being exposed to the direction of written Arabic. They cannot avoid triggering at least some rollover responses and hence (assuming the required macrosocial understandings) having the potential to learn some spoken words and linking them with images and scripts.

Users can, however, choose where and how they spend time with individual screens. Thus they can choose whether they explore the Spell screens or Alphabet screen. My intention was to have intrigued at least some of them, through recognizing the "look" of a written Arabic word so that they might want to know more about the basic elements of Arabic writing.

Thus, *Postcard* combines art and education. This is unusual as the audience for a new media artwork does not usually overlap with the audience for a piece of instructional multimedia. The intended audience for Postcard is thus unconventional, perhaps in an analogous manner to the unconventional audience for the Mail Art postcard. However, I do not see a separation in this work between art and education because part of the work was an exploration of the perception of otherness.

I had found that Westerners sometimes think that written Arabic is impossibly difficult to understand, and, by extension, they suspect the same to be true of Arabic culture. Thus in *Postcard* I offer a technical solution to a cultural issue. I designed the work so that users might pick up some Arabic without even intending it and the Arabic script might start to seem less *other*. Optionally users could also take the first steps towards learning to read it.

Postcard is not designed as a language coach or a formal set of Arabic lessons. Instead it is an exploration of communication, language

and writing, in which I also seek to suggest through engagement with place and people that the other is in fact accessible. Postcard suggests that perhaps there are no fixed boundaries between the self and other, perhaps in an analogous manner to the Integrationism claim that there are no fixed boundaries between language and non-language. However this is a huge issue; an in-depth exploration is well beyond the scope of *Postcard* and of this thesis itself.

Chapter Five
Writing, human–computer interaction and the icon

This chapter outlines how *Postcard From Tunis* contributes to the literature on writing and HCI. It discusses how *Postcard* articulates Integrationism and extends this theory into writing at the human–computer interface. The chapter concludes with a brief Integrationist look at icons and the human–computer interface and the foundation for future research.

1 Writing and human–computer interaction

> While Gutenburg's revolution made language in its written form central, the current revolution is taking us both backwards and forwards into hieroglyphics. Whether this is in the introduction of emoticons through the exploitation of the visual potential of typographic elements, or the proliferation of the use of icons in so-called written texts, or indeed in the treatment of (verbal) text itself as merely an item in a visual composition, in new-modal, multi-media forms of text, what is happening is a fundamental challenge to the hitherto unchallenged cultural centrality of written language (Kress, 1995, Preface).

A number of authors, including Bolter (1991; 2001), Tofts (1997), Aarseth (1997) and Hayles (2002a), have discussed how writing is transformed in the new space provided by the computer. A great deal of attention has been paid to the characteristics of the hyperlink and its consequences, for example in the work of Landow (1992; 1997). Less attention has been paid to the involvement of the computer in a coming together of the verbal and the visual, which is viewed by authors such as Kress (1995) as a movement of contemporary writing towards its historical ancestors.

The seminal work on the writing space of the computer was Bolter's *Writing Space* (1991), a wide-ranging historical analysis of writing technologies and their impacts on culture and communication. Bolter argued that electronic writing "gives a renewed prominence to the long-discredited art of writing with pictures" (Bolter, 1991, p.46). He thought that the computer medium fostered a kind of picture writing that "vacillates" between intuitive pictures and abstract alphabetic writing (Bolter, 1991, p.50).

Bolter revised and re-issued *Writing Space* as a second edition in 2001 to reflect changes in the intervening years. Firstly, the media landscape had changed with the development of the World Wide Web. And Bolter's own ideas had also changed, in particular he

thought that phonetic writing and its history now seemed less relevant. Instead, "the history of the tension between verbal and visual representation seems more important than ever... [and] ... the computer is not leading to a new kind of orality, but to an increased emphasis on visual communication" (Bolter, 2001, p. xii–xiii).

Interestingly his first edition had referred to Harris's *The Origin of Writing* as giving a different view to the usual account of the evolution of phonetic writing from picture writing. In the changed emphasis of the second edition, this reference was removed and there was no mention of Harris's works on writing at all. However, Bolter retained his view that electronic writing was a kind of picture writing.

> For us today, electronic writing shares qualities with both postliterate and preliterate picture writing. By combining alphabetic writing with images and diagrams ... designers are defining the computer as a writing space that vacillates between intuitive and abstract modes of representation (Bolter, 2001, p.61).

Bolter's view of writing continued to be conventional: "all writing entails ... the intention of the writer to arrange verbal ideas" (Bolter, 2001, p.16). He maintained that "[t]rue phonetic writing ... at least as embodied in the Greek alphabet, is remarkably uncomplicated. Subordinating writing to a single principle, it seeks to drain the pictorial meaning from the written sign" (Bolter, 2001, p.36).

In the intervening years Bolter had developed, with Richard Grusin, the concept of *remediation* (Bolter and Grusin, 1999), a term for the ways new media forms define themselves by "borrowing from, paying homage to, critiquing and refashioning their predecessors" (Bolter, 2001, p.24). Bolter argued that "for our culture today the computer is not only a new kind of book, but also a site for the refashioning of film, TV, photography" (Bolter, 2001, p.158).

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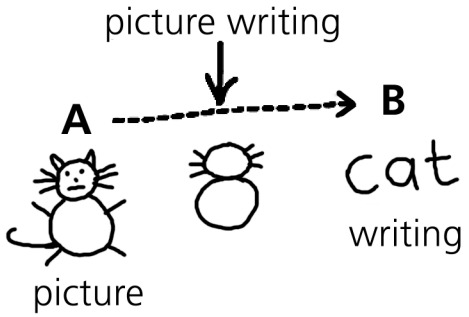
When I embarked on the creation of *Postcard From Tunis*, Bolter's view of the writing space of the computer as a kind of picture writing was the dominant perspective. Bolter's views remain influential and are widely quoted. But what exactly *is* picture writing?

On close analysis, Bolter appears to juggle two definitions. On the one hand, picture writing is simply a combination of (intuitive) pictures and (abstract) writing. On the other hand, it is a form of communication that has immediacy and captures "meaning ... at a level prior to the word" (Bolter, 2001, p.59). In the latter definition, it is a form of communication that is free from spoken language: "[t]he signs in picture writing, stylised images, seem to constitute their own silent language ... [and] ... two readers could explain the same message in different words" (Bolter, 2001, p.59). This latter definition resembles what others have called semasiographs, that is, writing that does *not* represent speech. We have already seen some of the limitations of this approach, which include defining something by

what it is not, assuming that real writing represents speech and creating unclear representational terms, such as the ideogram.

As could be expected, for Harris, picture writing is a concept with a very dubious theoretical foundation as it is based on the traditional ethnocentric view of the evolution of writing (Harris, 2001b). As discussed, in this view writing evolved from pictures by becoming less pictorial and more communicationally sophisticated. This process progressed from pictures through picture writing to word writing and finally to the triumph of the alphabet. According to Harris, picture writing is explained by locating the mid-point on this journey between pictures and writing. As is clear from its name, the new term is framed as the intermediate state between the two extremes that also has to explain how the first transformed into the second.



In other words, this account is completely circular.

> Picture writing is something that's got somehow or other to link pictures to writing. And that job is given to it *in advance* of anybody's understanding how the process could possibly have happened (Harris, 2001b).

Clearly this circular reasoning does not create an actual theoretical explanation of what picture writing might be. In fact, once the theoretical foundation is exposed, there seems no basis for continuing to use the term.

Some of the examples of picture writing given in texts such as Bolter's would probably be classified as non-glottic writing in Harris's model, that is, forms of writing characterised by no necessary tie with a particular language. However, as we have seen, for Harris a verbal/non-verbal division is not the central distinction to be made within communication or writing and I will return to this point later.

Meanwhile, perhaps it is possible to substitute the term *non-glottic* writing in place of picture writing in Bolter's view of computer writing. This no longer theorises the coexistence of pictures and writing, however, nor does it include all the forms of writing deployed in this space, which clearly must include glottic writing too. Thus, the concept cannot be recuperated and seems to come to a dead end.

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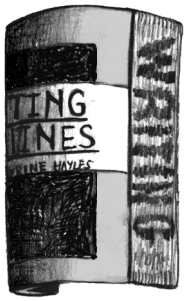
Bolter's 2001 edition of *Writing Space* also incorporated criticism that his previous edition was technologically determinist, that is, in the intervening years he also became aware that "writing technologies do not alter culture as if from outside" (Bolter, 2001, p. xiii). He drew attention to the *materiality* of writing: "writing never exists only in the abstract ... and is always a part of culture" (Bolter, 2001, p.18–9).

This theme of materiality is the primary focus for Hayles in *Writing Machines* (2002a): "I propose *material metaphor*, a term that foregrounds the traffic between words and physical artefacts" (Hayles, 2002a, p.22). She adds that

> [f]ocusing on materiality allows us to see the dynamic interactivity through which a literary work mobilises its physical embodiment in conjunction with its verbal signifiers to construct meanings in ways that implicitly construct the reader/user as well (Hayles, 2002a, p.130).

One of Hayles's arguments for a materiality of writing is actually made by her book itself, a paperback that reveals written text on its edge only on being firmly bent. This text is illegible until the book is bent and thus the (Integrationist) *formation* of this text requires an additional biomechanical activity on the part of the reader.



Hayles's claim that "*the physical form of the literary artifact always affects what the words (and other semiotic components) mean*" would not be disputed by Integrationists (italics in the original; Hayles, 2002a, p.24). However, they would have to challenge the implicit duality in Hayles's division between (abstract) words and (material) literary artifacts. Hayles appears to assume that words have an ultimate, abstract existence, independent of materiality, while Integrationism holds that words have no existence at all *except* as any number of material forms.

This duality is also echoed in Aarseth's (1997) separation of what he calls *textons*, that is verbal signs stored in media systems, from *scripton*s, verbal signs displayed for and by the computer user. Aarseth's texton recalls Harris's example of the reflecting triangle stored in the boot of a motorist's car. As discussed in Chapter Two, for Harris, this is not a sign at all.

Hayles draws attention to the visual-spatial and temporal materiality of writing through discussion of various works, such as interactive digital artworks and Artists Books. She describes Winkler and de Souza's ~~*database*~~, a work that features writing as ephemeral as speech

and which is apparently a reference to Derrida's concept of *under erasure*, although this is not acknowledged[4]. Another work discussed is Slattery's *Glide* (2002) which creates "a visual language that could be written and enacted but not spoken" (Hayles, 2002a, p.42). In spite of this intention, I found that the work, although beautiful and aware of the spatial dimensions of writing, seemed rather dependent on a dictionary of verbal text definitions of the "glyphs".

Hayles published an online extension of her book, the *Writing Machines Web Supplement* (Hayles, 2002b), which includes "scholarly apparatus and definitions of terminology". Its *Lexicon Linkmap* defines a number of terms, such as *glyphs* and *spatial writing*. For Hayles, *glyphs* are "non-alphabetic marks capable of acting as signifiers, e.g. in Maya, a pictorial element" (Hayles, 2002b). This definition echoes problems with the term semasiograph and lacks precision: non-alphabetic writing is a rather broad category, including, as we have seen, at least the Chinese script, musical notation, mathematical writing, and so on. *Spatial writing* is defined as

> writing that uses position and the physical space between textual components as a rhetorical device. Common examples include most poetry, some charts or diagrams, Jacques Derrida's *tympan*, and Laurence Stern's *The Life and Times of Tristram Shandy* (Hayles, 2002b).

Does this definition mean that for Hayles ordinary writing is not spatial? We do not know because *writing* itself is not defined, as if everyone knows what it is and it does not need defining. Hayles does make several observations about material, temporal and spatial aspects of writing, but they are not based on any specified theory of writing itself. Taken together, her definitions, including the absent one, imply that Hayles also assumes the conventional understanding of writing as representing speech.

In contrast Tofts (1997) does explicitly discuss the (traditional) theory of writing that he assumes. He analyses the history of writing as part of a "prehistory of cyberculture", a "narrative of syncopation, of shifting emphases and digressions in word and image" (Tofts, 1997, preface). For Tofts "[w]riting as we have seen, is a dramatic technology. It removes words out of a living, shared present *(la vive voix*) and locates them within an external, visual space of breathless signs" (Tofts, 1997, p.57) and

> something we absolutely take for granted ... the conventional equivalence of an individual letter with a single sound (phonography) revolutionised writing by refining it as the direct representation or transcription of speech (Tofts, 1997, p.49).

[4] This observation was made by Monika Wagner-Wise, Ballarat, 2003

Tofts identifies the development of the alphabet as a movement toward abstraction, a development that is continuing in cyberculture as abstract digital data is re-presented (Tofts, 1997, p.78).

Although an extensive analysis is beyond the scope of this thesis, as a group these writers appear to make several assumptions. These include the idea that words can exist as abstractions, independent of any material form and that real writing is the representation of speech. These assumptions have numerous problems, as we have seen, leading to words, in general, and written signs, in particular, being treated as abstractions, somehow already there, just waiting to be deployed, or as Harris puts it, part of an "inventory of signs already agreed in advance" (Harris, 2000b, p.87).

In contrast, *Postcard From Tunis* shows that through human–computer interaction it is possible to create signs, including written signs, that simply cannot be explained in these ways.

2 The contribution of *Postcard From Tunis*

Postcard From Tunis demonstrates, and extends into human–computer interaction, the validity of the alternative framework provided by Harris's Integrationist approach to communication and writing. Through the informal encounter with an unfamiliar language, a non-Arabic literate user has the opportunity to re-visit assumptions they might make about languages and scripts they already know and to experience that, in practice, there are no fixed boundaries between the linguistic and the non-linguistic.

Postcard shows that there are no fixed boundaries between writing and pictures and the question of what is writing will differ from person to person (and moment to moment) and depend on the macro-social, biomechanical and circumstantial aspects of the activities integrated. Neither writing nor pictures dominate each other. In contrast, they are shown in *Postcard* to be complementary, to be more similar than they are different. Rather than being polar opposites, both are based on spatial configurations. There is a considerable overlap between them in the way that analogies of size, proximity, and so on, establish internally syntagmatic relationships. As we have seen, one major difference between them is in the way that they are scanned.

Postcard From Tunis expresses the Integrationist view of writing as spatial configurations integrating the past, present and future activities of reading and writing, and requiring scanning according to rules. Through the emblematic frame provided by the Arabic alphabet, the glottic Arabic script is presented as integrated with, rather than representing, human speech communication.

Postcard From Tunis demonstrates that the new activities the computer makes possible can transform static written signs into kinetic and dynamic signs that can, for example, show in writing but not in words, how the user is to read them. *Postcard From Tunis*, thus, begins to explore the actual flexibility of the graphic sign and the potential for writing to create its own forms of expression, forms that are not

tied to words. *Postcard* suggests that there are many more possibilities here and that perhaps, as Harris has speculated, the computer "merely allow[s] us to see more clearly what writing always was" (Harris, 1995, p.163).

Positions characterised by Bolter's combination of (intuitive) pictures and (abstract) writing forming a kind of vacillating computer picture writing space assume a fundamental distinction between verbal and non-verbal communication which, as Harris has explained, "is parasitic on the very mode of theorizing which treats it as basic" (Harris, 1996, p.25). This view, along with the abstract existence of words, may be explicitly stated or simply assumed.

Rather than having to further extend the picture writing metaphor with the addition of audio activities, my research suggests we shift the focus away from speech and words altogether and, instead, study the *activities* that are actually integrated in the computer space. The Integrationist sign provides a powerful and flexible theoretical alternative to the bipartite verbalist sign, with form on one side, content on the other and an implicit pressure to find speech correlates for the content. The Integrationist sign allows us to describe what *Postcard* shows can actually be created through rollover activities at the human–computer interface, that is, what might be called *supasigns*: combinations of static written signs and kinetic screen cursors, and of kinetic auditory and static scriptorial signs, or the dynamically reflexive written sign that shows, in writing, how to read it.

In fact *Postcard* uniquely supports Integrationist theory because it demonstrates, in a way that cannot easily be done with words on paper, the Integrationist idea of the creation of meaning through the integration of activities. These supasigns can only be created through the integration of rollover activities; there is simply no way that they can be considered to be signs already created and ready in advance before an actual, material communication.

As for the concept of a word, *Postcard* shows that words can only have any number of actual (material) expressions: how else would you ever know about them? Nor have they abstract, invariant meanings or forms, but rather a variety of forms and meanings depending on the activities integrated.

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In summary then, *Postcard From Tunis* is an exploration of writing set in a personal portrait of Tunis and using the metaphor of the postcard. It both researches and communicates the nature and possible transformations of writing and communication that are possible at the human–computer interface. The outcomes extend and express an Integrationist and non-verbalist approach to human communica-

tion. *Postcard From Tunis* uniquely articulates this approach by expresses the integration of activities in a way that is impossible with conventional writing. In turn, *Postcard From Tunis* needs Integrationism in order to theorize the creation of signs that it shows are actually possible.

In addition, this thesis has outlined two aspects of my experience of writing in the Tunisian context: the alternative view of the rebus and the ancient emblem of the fish. These, in conjunction with *Postcard From Tunis*, give practical support to Harris's alternative view of the origin and nature of writing itself.

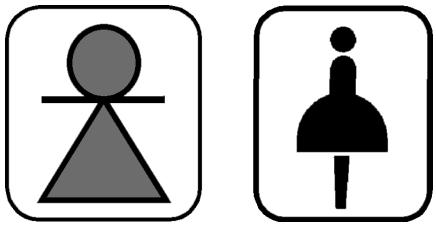
3 Icons and human–computer interaction

> The concept of text that transcends the distinction between verbal and non-verbal ... holds the key to the development of writing as a form of human communication on the twenty-first century (Harris, 2000a, p.61).

To return to the place where I first started, that is, to the icon at the human–computer interface, my research suggests that the fundamental questions about the icon are neither *Is it writing?* nor *Does it represent a logogram, a pictogram or an ideogram?* Instead, the first question must be *What activities does it integrate?* As has been shown by the theory of Integrationism and its expression in *Postcard From Tunis*, a new theory of icons must involve shifting the focus away from words and representation altogether.

It is here that we return to Harris's speculation in 1986 about the future of writing:

> ... the origin of writing must be linked to the future of writing in ways that bypass speech altogether (Harris, 1986, Epilogue).



Above are two graphic signs at opposite ends of the history of writing. On the left is a sign of the Phoenician goddess, Tanit. On the right is an airport sign. If we ask of either sign *What does it say?* or *What does it represent?*, we are missing the point.

The sign on the left is from an ancient culture and we may never really understand what it meant in its ancient context. The sign on the right does not represent *Ladies* or even *Females can go to the toilet here*, although it could be integrated with the same activities as such written signs might be. Erecting a verbal/non-verbal dualism as the key distinction to be made here or searching for something that these signs "represent" is missing the point. From an Integrationist perspective the important question is, *What are the macrosocial,*

biomechanical and circumstantial aspects of the activities they integrate? It is this perspective that provides a foundation for a future analysis of the icon.

To extend this framework into the human–computer interface itself, my research suggests we stop trying to understand the computer by searching for forms of communication that the computer *remediates* (counting machines, writing machines, film and television machines, and so on). The key to the development of any new, "post GUI" interface is to study human–computer communication from first Integrationist principles. This analysis must include the communicational presuppositions that have already been made in the design of the computer and its interface.

Manovich's influential text, *The Language of New Media* (2001), provides an interesting example. Manovich writes that "[r]ather than imposing some a priori theory from above, I build a theory of new media from the ground up" (Manovich, 2001, p.10). However, to continue his analogy, it appears that the basement already contains assumptions about language. Manovich writes that "All computer users can 'speak' the language of the interface" (Manovich, 2001, p.xv), which suggests a conflation of language with spoken language. He explains that "I use 'language' as an umbrella term to refer to a number of various conventions used by designers of new media objects to organise data and structure the user's experience" (Manovich, 2001, p.7). This suggests the assumption that language is a kind of code, vocabulary or set of conventions.

Harris maintains that it is impossible to innovate in HCI if you do not explicitly clarify not only your own assumptions, but also the macrosocial conventions it is assumed that everyone knows and accepts when they approach a computer, for example, the embedded binary oppositions and decisions (Harris, 2001b). This is the "emperor's new clothes" approach that enabled Harris to analyse writing at a fundamental level and to avoid the "representation of speech" assumption which verbalism encourages and which has lured so many others.

My research argues the validity of the Integrationist approach and suggests that we should not view the human–computer interface as a combination of a set of tools (somehow there and available for use) and their use in action. Instead I propose that we take up and extend with Integrationist theory a definition presciently proposed in 1990:

> [t]he human–computer interface describes both where and *how* the human user and the computer meet (Australian Science and Technology Council, 1990, p.3).

The study of signs has recently gained importance in the analysis of new media and the human–computer interface, for example in the establishment in 2001 of the annual conference on Computational Semiotics for Games and New Media and in the work of Light (2001) and Innocent (2003). From an Integrationist perspective this is appropriate because signs provide an interface between different hu-

man activities anyway (Harris, 2000, p. 69). My research suggests the value of a future detailed analysis of human–computer interaction using Integrational semiology (rather than dualist semiotics) and theorising human–computer communication as the contextualized integration of activities by means of signs.

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Appendixes

1 A map of the screens

Individual screens in *Postcard From Tunis* have been given a reference number, for example, Screen 13, so that the map below can be used to proceed quickly to a particular screen in the CD-ROM.

Figure 7 A map of all the screens in Postcard

To use this map, start the CD-ROM and click the Welcome screen (see Appendix Two if details are needed).

At the following screen, click the  button (at the top left hand side) to get to the equivalent map (without the numbers) on the CD-ROM. Match the screen number with its corresponding screen fragment in Figure 7 above and click that same screen fragment on the CD-ROM screen to go to directly to the screen.

2 A short tour of *Postcard From Tunis*

It is recommended that you listen to this work using good quality stereo speakers or headphones.

If you have the Macintosh version (v.1.0), double-click the *Postcard from Tunis CD-ROM*; then double-click *START*.

If you have the PC version (v.2.0), double-click the *PostCard* CD-ROM; the CD should start automatically; if it does not, double-click *POSTCARD.EXE*.

Click anywhere in the *Welcome* screen, then move the cursor around the *Introduction* screen; click the door.

Move the cursor around the *Map of the Mediterranean*. Click the location of Tunis when the cursor changes to indicate a hyperlink (Tunis is shown as a point, south west of Sicily. Its position is emphasised by an arrow).

Move the cursor around the next screen, then click تونس (*Tunis* in written Arabic).

Move the cursor around the *Tunis* screen, then click the woman with fish.

Move the cursor around the *Fish* screen, then click the design of three fishes.

Move the cursor around the *Writing* screen, then click the word *Phoenician* (it appears when you move the cursor to just underneath this symbol:).

Move the cursor around the *Phoenician* screen, click , then click it again.

Move the cursor around the *Trading* screen, then click (at top left hand side of screen).

Move the cursor around the *Map* screen, then click the streetscape (it is pale blue, to the left of the door and above the giggling child holding a coffee cup).

Move the cursor around the *Streetscape* screen, especially over all the audio hot spots (shown as flowers), then click the same button.

Click the woman with the fish (to the left of the giggling child).

At the *Tunis* screen, click تونس.

Move the cursor around the *Spell Tunis* screen, click and then click the four buttons (*a,b,c* and *d*) in the window.

Click ابت.

Move the cursor over the letters in the *Arabic Alphabet* screen. Notice that you can also trace the large alphabetic letter in the middle of the screen.

When you are finished, click again.

Click the giggling child holding a coffee cup.

Move the cursor around the *Coffee* screen and click the giggling child.

Click again and either: click the screens you haven't yet visited (that is, those not marked with a pale blue cross); or quit by clicking قف STOP.

This brief tour shows you about a quarter of the whole CD-ROM.

3 Awards and exhibitions

Postcard From Tunis was a very successful nationally and internationally award-winning interactive multimedia artwork. It was exhibited in the active and international scene of what is variously called new media, electronic, digital, multimedia or CD-ROM art. *Postcard* was seen by these audiences in eleven different countries and selected for such prestigious events such as the *New Talent Pavilion* at Milia, France and *Contact Zones: The Art of the CD-ROM*, a touring show

curated in the USA. *Postcard* was reviewed in four countries and has been acquired for the collections of national and international arts institutions (such as The Museum of Technical Innovation in San Jose, USA), University libraries and many private individuals.

I put a great deal of effort into getting *Postcard* seen by its national and international audience. Substantial amounts of research and activity went into locating all the appropriate events (including those not listed, where *Postcard* did not succeed), submitting the work along with the diverse range of documentation required and then publishing the CD-ROMs (version 1.0, the Mac version and version 2.0, the PC version). I have discussed this process in a paper, *The Artist as Self Publisher* given to the Australian Film Commission's *Being Connected* conference in 1988[5]. The paper also discusses marketing the work at appropriate trade shows and selling it through a web site.

Postcard has won the following awards:

- Gold Medal and Award of Excellence in Personal/Group Titles, 1997 NewMedia Invision Awards Festival (USA)
- Selection for the New Talent Pavilion, Milia 1997 (France)
- Shared First Prize, Arts_Edge Multimedia Competition 1998, (Australia)
- Finalist in Best Use of Sound, 1997 ATOM Awards (Australia)
- Finalist in Best Student Work, 1997 AIMIA Awards (Australia)
- Finalist National Digital Art Awards 1998, Institute of Modern Art (Australia)
- Finalist Competitive Exhibition VIDEOBRASIL 1998 (Brazil)
- Finalist International Competition Videonale 8 (Germany)
- Finalist CD-ROM competition COMTECart '98 (Germany)
- Finalist Competitive Program Retina 2000 VII International Film & Video Festival (Hungary).

Postcard has also been exhibited in the following events:
Matinaze, Art Gallery of NSW, Sydney 1997 (Australia)
E-Media Gallery, Australian Center for Contemporary Photography, Melbourne 1997 (Australia)
WOW Film Festival, Chauvel Cinema, Sydney 1997 (Australia)
12th Summer School of Radio, Arles 1997 (France)
Rencontres Internationales de la Photographie d'Arles, Arles 1998 (France)
ACM Multimedia 1998 Art Program, (USA/UK)
CDWomen@Ngapartji.com.au, Ngapartji Multimedia Centre, Adelaide 1998 (Australia)
Apple Multimedia Gallery, Australian Film Commission's *Being Connected* 1998 Conference (Australia)
Muumediafestivaali 98, Kiasma Museum of Contemporary Art (Finland)

[5] the conference publication is at www.screenarts.net.au/being connected/bcframe2.html; my paper cannot be individually bookmarked because of the use of frames, so I have also placed it at www.sallypryor.com/artpub.html.

Ways of Being Touring Exhibition curated by Ivan Dougherty Gallery, 1998–1999 (Australia)
Seventh Annual Biennial Symposium on Arts and Technology, Connecticut College 199199 (USA)
Women in the Director's Chair International Film and Video Festival, Chicago 1999 (USA)
Contact Zones: The Art of the CD-ROM, Cornell University 1999 (USA); subsequently touring internationally and now housed in the Rose Goldsen Archive of New Media Art, Cornell University
2nd International Show of Art in CD-ROM, MECAD Media Centre d'Art, 1999 (Spain)
VideoLisboa 2000 (Portugal)
Dissection: International Multimedia Art Exhibition Macau Museum of Art, 2000 (Macau)
medi@terra 2000 International Art and Technology Festival & Symposium (Athens, Greece)

4 Production credits for *Postcard From Tunis*

Artist/programmer/director	Sally Pryor
Co-director	Faical Kosri
Sound engineer	James Hurley
Sound design	James Hurley with Sophea Lerner and Sharon Etter
Musicians	Jamal Zraika, Ghazi Nassouh, Patrick Najem, John Zorzi, Tunisian *stombeyli* musicians, Tunisian family and friends
Arabic calligraphy	Ahmed Ladkani
Consultant Arabic teacher	Sammy Massoud
PC version	MetaForm SoftWare
Year of production	v1.0 1997 (Macintosh- compatible), v2.0 (PC-compatible) 1999
Financial support	The University of Technology, Sydney; the University of Western Sydney; and the Australian Network for Art and Technology