

## A multimedia course in associative learning

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Describes a multimedia course in associative learning, resident on CD-ROM, and currently available for Macintosh computers. The course is presented using HyperCard and comprises of some 70 mini-lectures grouped into nine chapters. Each mini-lecture consists of an audio track, bullet charts, quotes, graphs, pictures, animations, photographs, and most contain one or more video clips. The text for each mini-lecture is available on an adjacent card.

The present paper describes a multimedia course in the area of "associative learning" developed for use on Macintosh computers and available in CD-ROM format.

There is some debate concerning the use of the term "multimedia." It is clear that many people believe that adding photos, bullet charts, sound, and animations, comprises multimedia. However, we now have the ability to present real-time video on a computer screen. I use the term "multimedia" in the latter way.

The confusion surrounding what is multimedia arises from the fact that this is a very recent technology. There are few, if any, production standards and authors have to learn by doing and by user-testing to determine what works. In the present case, I made certain decisions based upon my experiences of using computer-aided instruction (Bond & Siddle, 1987) and following presentation of the material to "users". Users were defined as any person I could get hold of to have a "play" with the material. They did not necessarily comprise the target audience, but then I did not wish to constrain the production to a particular audience.

The two most important decisions were to use HyperCard rather than an authoring package and to present the program in an essentially linear fashion. These decisions

were based upon the need for the program to be as responsive as possible, and to constrain the user's ability to branch, given the ultimate size of the program.

Both of these objectives have been met. The program is fast and this speed enables users to move quickly from one part to another, thus replicating one of the advantages of branching.

I began the project by writing outlines for nine "lectures", each of which comprised some 5-12 mini-lectures (see Fig. 1). These mini-lectures were then converted into scripts, which were made into audio recordings. The scripts were then used to determine the supporting material that would be needed. This material was then blended with the audio track to produce a series of "movies" to make up the production (Bond, 1996, in press).

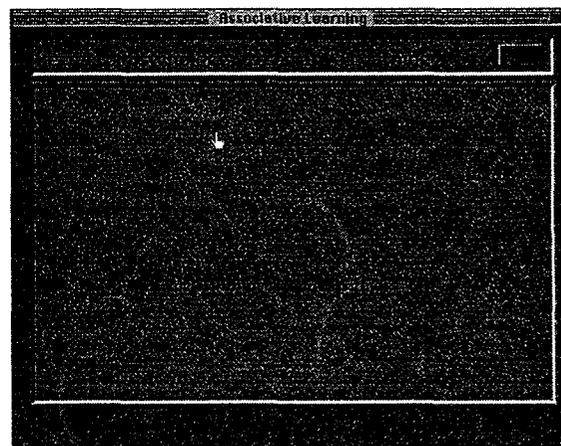


Figure 1 - "Contents" card

Of course, there are important differences between these mini-lectures and a normal lecture. First, the mini-lectures range in duration from 30 seconds to five minutes. Thus, they are similar in length to the average TV advertisement. Essentially, they present one concept and use a variety of supporting material to get that concept across. Second, they are "perfect", every time. No ummms, ahhs, or OKs! Third, the supporting material comes on at exactly the right moment. Finally, and most importantly, if you yawn, look out of the window, or if the phone rings, you can stop, go back, and pick up at the exact point where the interruption occurred.

Having developed a script, you have some idea of the supporting material that you will need to produce. To assist comprehension and to provide cues to the listener/reader as to what is important, that means developing a series of screens to accompany the dialogue. One needs photographs, graphs, and bullet charts to illustrate points (see Fig. 2). The latter also serve to draw the user's attention to the important points being discussed. Importantly, all of this material can be placed, with precision, at the point in the dialogue where it is most effective.

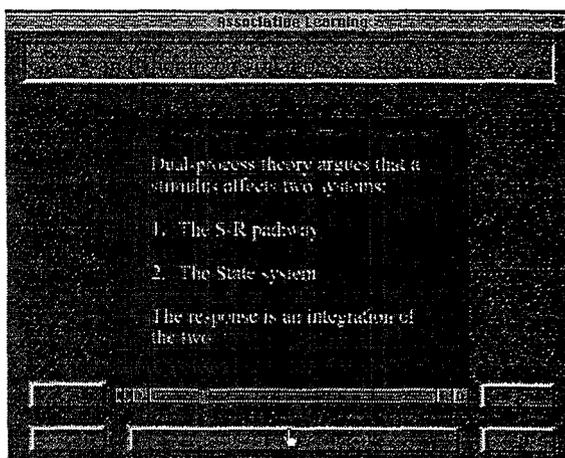


Figure 2 - Unfolding bullet chart

Further, it is very easy to produce animated graphs using the present technology. For example, we have been able to use this technique to illustrate how current mathematical models make predictions about learning outcomes. Furthermore, the ability to present material dynamically allows us to provide the user with "real" examples of some of the things being discussed. For example, we can actually present stimuli to the user, allowing them to experience the different relationships between the conditioned stimulus and unconditioned stimulus in Pavlovian conditioning. Similarly, complicated graphs can be broken up. One set of data can be presented and discussed, then other data sets and explanations can be added in turn. Finally, animating some graphs can attract the user's attention, thus making the presentation more dynamic (See Fig. 3).

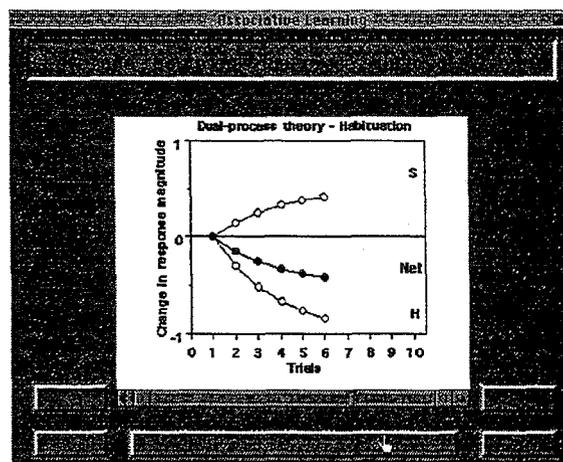


Figure 3 - Unfolding graphic

The most important supporting material is film, and unlike video, the user has complete control over the playback process (see Fig. 4). Thus, they can watch a piece of video through at normal speed. They can single-frame forwards or backwards. They can freeze the film. If they want to watch the whole thing through again, it takes no more than a second to drag the pointer back to the start using the mouse.

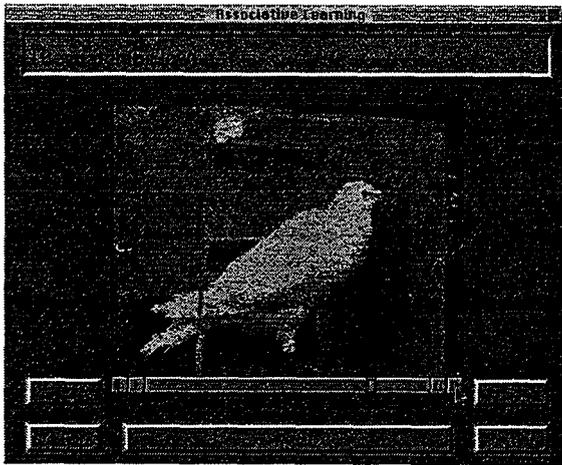


Figure 4 - Still from a video sequence

We are aware that people may not wish to listen to a sound-track. We have provided two alternatives for such users. First, the entire script is on the CD-ROM in TeachText format. Thus, any user will be able to print out the entire script and sit in front of the computer, working with all of the visuals, but without the soundtrack. Where a user wants this information on an irregular basis, the text for each of the movie cards, is placed in an adjacent card. Controls are available to allow the user to toggle to the text card and back to the movie card.

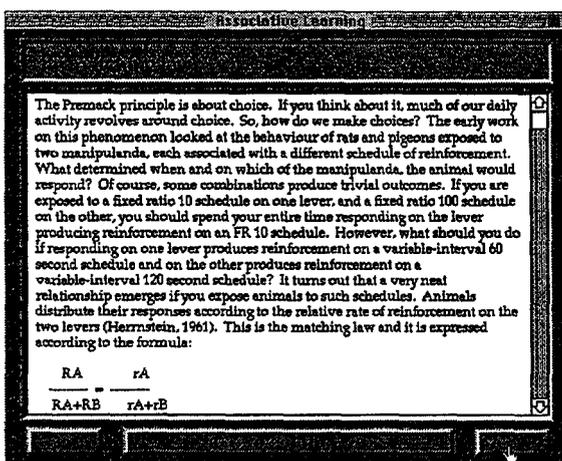


Figure 5 - Text page for movie containing Fig. 4

These are the advantages of a multimedia course. A textbook is an excellent vehicle for presenting large amounts of information, but that information is static. A multimedia presentation can convey information in a dynamic fashion. Further, we are most likely to remember something that impacts upon us in many ways. In the jargon, it excites more nodes in associative memory. Thus, you can read about some phenomenon and remember a little about it, add a picture and you will remember a little more. Add a video clip of the phenomenon and you will remember a lot more.

The final product is on CD-ROM, where it can be used in a number of ways. Some lecturers may wish to use it and a textbook as the basis for an entire course. Some lecturers may wish to lecture as they do now, but employing the many graphics, which we have provided, in their lectures. Others may provide access to the CD-ROM in much the way they refer students to a textbook. All of these are appropriate uses. Regardless of the ways in which the material is used, we anticipate that we will get suggestions as to ways of improving our presentation, material that might be deleted and material that might be added. Altering the course could not be more simple. We can modify the program and write new CD-ROMs. Voila, the Second Edition is born.

### Acknowledgments

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## References

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## Footnotes

<sup>1</sup> HyperCard is a copyright of Apple Computer Inc.