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# The Importance of the Interface Design in a Foreign Language Teaching Program.

by

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Date: December, 1994

# The Importance of the Interface Design in a Foreign Language Teaching Program.

**by Anne Brose**

This Thesis Dissertation is dedicated to my parents:
Wolfgang Paul Brose and Helen Eileen Brose

Who have always encouraged me
to follow me dreams
and who have taught me
that education is the most valuable
possession anyone can have.

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# TABLE OF CONTENTS

# INTRODUCTION

As I was growing up, speaking different languages was common in my family. My siblings and I grew up speaking three languages, and I believe this is one of the reasons for my fascination with them. However it is not in knowing the languages, but in the teaching and learning of them that I have been intrigued. Throughout the years I have discovered that the more you speak a language the more fluent you become. This has also been proven in the teaching methodologies available to those who want to learn a foreign language - practice makes perfect.

Individuals who grow up speaking several languages have an easier task learning an additional one. They are able to compare, and are familiar with the formation, pronunciation and structure of each language. The reason for this is that they had to fine tune the differences between the languages they knew in the first place. "The problems of description are complicated by the fact that infants exposed to two languages from the beginning do not learn bilingually." [1] "The small child first learning the language of the environment faces an enormous task: Subconsciously he must make a complete structural analysis of the language and slowly, step by step, learn to imitate the system in active speaking." [2]

"It takes time and much effort to learn ever finer subcontrasts, until eventually the whole complex structural mechanism of the developed language is assimilated."[3] Once the individual has learned the differences, speaking a second language becomes quite natural.

It is in the later stages of an individual's life that learning a second language becomes more difficult. Not used to the easy translation from one language to the other, the beginner must learn the basic structure of the language, step by step. And unless he practices consistently, whatever he has learned is soon forgotten.

When learning a second language the individual must not expect the language to behave like English, because it has different sounds, and the words have different meanings. Learning a language is a physical activity; it is something that needs

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1 Hatch, p. 24
2 Hatch, p. 24
3 Hatch, p. 25

practice. And since learning a language involves learning sounds, one must practice aloud.

It is much easier to learn a language when one is surrounded by it - many individuals go to the country where the language they want to learn is spoken. I believe this is the most effective way of learning a language, because there is a constant reminder of it. And one is forced to speak the language in order to get by.

Fortunately for the learner, computer based instructional programs are becoming quite in vogue nowadays. With the use of a computer, enough memory and CD player, people are able to learn languages on their own, in fun and amusing ways. One of the important aspects of learning on a computer is that it allows for constant repetition without tiring anyone. Computer programs nowadays are designed to allow the student to learn at their leisure, with all the time in the world.

Since computer instructional programs allow for this leisure, how effective can they be, if the student gets at it when they please? How can we make them come back sooner, and use the program more? Or is using the computer a good enough reason for the student to come back more often. What really stimulates students to learn on their own? Is the innovative design of how the information is presented good enough or are there other reasons that stimulate the learning process: color, graphics, teaching method, etc. ?

I had seen some Spanish computer programs and wondered why they couldn't be more visually appealing. Why were they even being created and sold like that? Maybe it really doesn't matter. However, I wasn't stimulated, and even though the program was in many cases well thought out, I didn't want to go back to it very quickly. If I felt this way, how would other students feel?

It is in answering these questions that I decided to create a computer foreign language teaching program. Is learning the language on a computer alone reason enough to study? Or is the design of the program the reason for students to go back again, and again, to practice?

# DIFFERENT TEACHING METHODOLOGIES

### Interview with Professor Rosie McGinn

(French Teacher - University of Syracuse)

I had the opportunity of meeting Ms. McGinn at the *Teaching Tools of the 90's Conference* in Syracuse. She was presenting her interactive French teaching program which was created with HyperCard. Although it was in an experimental stage, she felt that her students would learn the language more effectively.

Her fascinating interactive program included Quicktime™ movies and sound recording. I did notice that the graphics were pretty simple and they had no visual stimulation. Much of it was text oriented, and the few drawings were not very appealing. The program did have some attractive features: each lesson had a Quicktime™ movie that portrayed everyday situations. After listening to a French dialogue between two native speakers in real life situations, students had to work on the exercises created based on the movies presented to them. Another attractive feature was the recording capabilities of the program which allowed a student to practice his speaking skills. A wave form created after the sound had been recorded showed the pitch of the student's voice. If the curve was similar to the original sound, the student was learning to speak the language well.

I questioned: Why aren't the graphics more appealing? Are they really important to the learning process? Would they stimulate the student into learning more? Or is it the mere fact that the language is taught on the computer that makes the learning process more interesting and appealing? These questions came back to me over and over again, and they were the reason behind my designing and creating the interactive program of *Español Fácil*. I wanted to find out.

After this conference I visited Professor McGinn at the University of Syracuse. She said maybe we could help each other since she agreed that her program could use some help in the graphics department. Once again she showed me her program, and as I looked at it in close range I could appreciate it even more. Each lesson was carefully planned. She had reading, listening and

speaking exercises, and since she started creating the program she had been adding many things like clicking on words where the student could get a definition, clicking on words to listen to the sound in French.

She proceeded to show me a language lab where students could come and use the program as well as do their assignments. If the program taught the language effectively, according to her finding, she would consider not having a lecture class anymore. Most of the students would learn at the lab.

As a personal observation, I felt the program was too text-oriented, and graphically unappealing. I questioned Professor McGinn as to the possibility of adding color and better pictures. She agreed with me, and she thought it would be much better, and more stimulating. Unfortunately, there was a big concern: memory. She concluded that if she could use color without affecting the size of the program, she would add it to the program. She believed that she eventually would in order to make her program more attractive, especially since HyperCard 2.2 was already out, a program with more capabilities than the earlier version she used to create her program with.

**Interview with Professor Willard Daetsch**
(German Teacher - Ithaca College)

Professor Daetsch presented his German program at the *Teaching Tools of the 90's* as well. He too had created a HyperCard stack, taking a different approach: using cartoons to teach the language. He had acquired the rights of Dik Browne's character *Hägar the Horrible* and recreated some strips in the program, translating them into German. He discovered his students enjoyed the cartoons as well as learning the language, and thus used this cartoon software as a supplement in some of his classes.

In my visit to Ithaca College, Professor Daetsch broadened his information on this fascinating program. The Hägar cartoons he chose always included a complete message in one strip. He discovered through his years of teaching that when students are in the early stages of learning a language it is best to teach them a

limited amount of subject matter. This is sometimes difficult to do when teaching the language authentically at a College level where the students want to take the class. It is their choice to learn German in this case, for their future use in real life. Therefore it was important to also teach the language at an adult level, without making it boring or too basic. He felt that the cartoons fit perfectly, especially in how he dealt with the different lessons.

A strip is presented with some German text where Hägar is talking. If you clicked on a certain button, you would read the translation. But sometimes the student wants something more than a mere translation, so they had the option of clicking on another button where they could get a grammatical explanation, or clicking on another button where they could learn sentence structure.

The program Professor Daetsch has created has been widely accepted and it has even been published for sale in bookstores. He now has two hundred and twenty Dik Brown cartoons, all placed in a simple HyperCard stack program.

The programs are divided in sections: *Level of Difficulty Subsets, Functional Notational Subsets, Grammar Subsets, Browse all the cartoons, Go to Instructions and Help, Go to the Glossary*, as well as descriptions of the characters and the capability of listening to the sounds.

Professor Daetsch has been involved in language teaching throughout his life and has been closely associated with different breakthroughs, methodologies, and associations in foreign language acquisitions, and is very much interested in research, especially that which deals with learning processes. He is very much interested in what motivates students and their learning styles, and he believes that:

> "This research is important because when available
> in sufficient quantity it should enable us to prepare
> materials for students which will be appropriate to their
> mode of learning and to their other academic interests.
> I believe that the directors of learning centers will
> with increasing frequency find themselves partners
> with teachers in providing for students vastly  diverse
> materials through a variety of media." [4]

In evaluating his program Professor Daetsch has expressed an interest in adding recording to its capabilities. He also agrees with me that learning the language would be easier if students could compare their language speaking skills to previous correct sound. Graphics were also important, and he believed that color could enhance the program as well as stimulate the student.

Professor Daetsch doesn't believe that there is one way to teach a language. He has been successful in creating and using his program for his students, but he recommended I evaluate other programs that are currently on the market and which he has found interesting, like *Transparent Language* which comes with a tape so that the students can listen. This particular program is highly text oriented. He also recommended looking at other interactive programs that he found graphically appealing like *Hanna's House*.

"Make it fun, explore around." was one of the recommend-dations Professor Daetsch made when talking about the program I wanted to create. A final important note he made was "take the culture in thought when creating a Spanish language program" because we want all the users to feel identified with the particular language they are learning.

**Transparent Language** (Computer Program)

This method of teaching a foreign language does not believe in courses or cassette programs that use a "chapter by chapter skill building approach." *Transparent Language* presents teaching a foreign language in slightly a different way. The learner who decides to use this program will receive stories in four languages and audio cassettes.

These stories are placed in text format, with no appealing graphics, and with no interesting navigation tools. The students learn by reading the story they choose and listening to it from the cassettes. They have to relate the sound of the word with the one they are reading. After a few times on the story they should be able to comprehend the language better. In some cases they have the opportunity to click on text to view the definition. Alternatively, they can study sections of the story for the grammar.

The user scrolls and reads the text. In boxes below there are help buttons in case they don't understand something. The program includes an original language text, word translation, phrase translation , word grouping, sentence or clause translation, notes and comments.

## Hyper Glot 's Tense Tutor

This simple black and white hypercard stack is a program created to help the learner to master the forms of verb tenses in Spanish. In addition, it improves the user's comprehension of spoken language.

Unfortunately for the newcomer to the interactive use of Spanish teaching programs, this one has very complicated instructions, and the layout of graphics does not help. One has to figure out where the instructions are, and it would probably take the user a couple of hours to acclimate to the program.

With the advance in interactive media, this stack looks archaic. Putting aside the poor graphics, sometimes illegible interface and unclear instructions, it does have a good verb drill and, once the user figures out how to use the program, it may interest them enough to compensate for it's poor graphics attributes.

The basic layout of the program is divided as follows: It has a working page, where the user sees the tense selected. Clicking on a "Test Me" button starts the drill. The first sentence appears on a large field. The infinitive form of the verb that is being drilled appears on a field above. The user has to conjugate the verb according to the way the sentence is written. An asterisk indicates the position of the verb that has to be conjugated. Below the field lies an "Answer Field" where the user types in the conjugation of the missing verb in the sentence. After pressing the return key, they will get feedback indicating whether they are right or wrong.

There is a score button, which allows the user to verify their right answers. The sentences will repeat after a while giving the user another chance to write the verb in its correct form. All

sentences in the program have been recorded by native speakers, and the user has the option of listening to them by clicking on the "Hear Sentence" button. If the user wants to practice understandding the spoken language, they may activate the "Hide Sentence" and "Auto Hear" checkboxes. After doing this, the sentence will automatically be read out loud.

**Interview with Kathy Moore**
(Spanish Professor - Fillmore Central School)

Mrs. Moore has been a Spanish teacher at Filmore Central School for nearly 15 years, and she has performed extensive research in teaching English as a second language. Although it is not the same as Spanish, the principles of teaching another language apply.

In her Master's thesis paper *Computer Software that works with ESL students* Mrs. Moore wrote that one of the "most frustrating things that an ESL (English as a Second Language) teacher encounters is finding the best software for her students." [5]

Even though the thesis report was written in 1990, the topic is still relevant today. When learning a new language that is not native to the student, one must take many things into account, like language art skills and cultural knowledge.

For students learning with computers it can either be frustrating or exciting. These considerations should be taken into account when creating an educational program, particularly if the students have had little or no exposure to computers. In and of itself, a lack of familiarity with computers adds difficulty to the teaching process. In such a situation students must deal with two learning processes: learning how to use the computer, and learning the language itself.

However, there is a positive side to this problem. Students who do learn how to use the computer more enjoy learning the language, and their attention is focused totally on the subject. Does this mean that the student's learning abilities improve? Not necessarily. It all depends on the classroom strategies, the environment, the influence of their peers, the motivation, and the

effort the student might have to make in learning.

A final and interesting point made in her thesis paper is that "ESL teachers should be willing to modify their methods based on what students say and do." And " there are many software programs out there to choose from. The problem is finding the best ones." [5]

I informed Mrs. Moore that in creating an interactive Spanish teaching program I was more interested in how well the students learned the language if motivated by color and appealing graphics. In order to find that out, I was creating two programs, one in black & white, and one in color and I was looking for a sample of 100 students to test both programs. These students had to be older than Grade School students and they couldn't have any prior exposure to a romance language.

This was quite difficult, since New York State law requires every student from seventh to twelfth grade to take two years of a foreign language, and finding such a naive sample would be difficult .

Mrs. Moore teaches all these levels at Filmore Central School, and she was happy to provide her classroom time to have her students test both programs. Consequently, she suggested I use five words she had not yet taught her students, thus making it possible to have the testing done.

There were many variables to be taken into consideration. Did the school have the equipment to do the testing? If they had the equipment, did they have the memory space and the software to make the program work? After many visits to the school, Mrs. Moore provided a week of her classroom time to have 108 of her students try both the Spanish programs.

**The Cortina Method** – Visit to the Institute in Massachusetts

The "Cortina Institute of Languages" offers to those who are interested in learning a language a self-teaching course in Spanish, French, German, Italian or Modern Greek. The methodology of teaching is "you learn by listening." The course offers the student a package of 8 cassettes, a companion textbook, a supplementary

conversation book, a guide to better language study, a bilingual dictionary, self-correcting exercise book, spoken-language comprehension test numbers one and two, and final exams. This method believes in repetition, since it's the basis for language learning, and it is important that the student learn correct pronunciation from the start.

In the beginning Cortina's Method book an alphabet and a pronunciation guide is provided. This explains how to pronounce the sound, word and phrases with English phonetic symbols. In the first lesson the student is able to read it aloud in its entirety. The lessons are written out in a simple step by step basis so that the student can follow them easily. For example: "a vocabulary of important words of a general character" vocabulary that covers the topic of that specific lesson, conversations that show how each word is used.

To the right of each sentence one can find the phonetic spelling for correct pronunciation. Next to the sentence is the English translation.

The Cortina Method emphasizes it's learning through memorization and repetition as well as listening. The student repeats the sentences out loud, after memorizing the vocabulary in the beginning of each lesson. Soon he or she is able to associate the word with a sound and its translation. At the bottom of the page are footnotes that give a grammatical explanation of the exercises. "The best way to learn a language is by speaking it" stresses Cortina's Method . 6

The book provided with the program consists mostly of text and some very basic drawings. Not much emphasis is made on the association of a word with an image. The student has to rely on imagination when translating the words.

**HyperGlot's LEARN TO SPEAK SPANISH**

This program is one of HyperGlot's most recent achievements in creating a program on a CD-ROM, where they combined graphics, color, sound and movies to teach a foreign language. *Learn to Speak Spanish* consists of 30 chapters that

contain exercises on everyday situations that an individual might go through in a foreign country. Each lesson is divided into several parts: Introduction, vocabulary, vocabulary drill, a story, the action, listening skills, exercises and communication skills.

The self learner is able to hear and see native speakers by way of Quicktime™ movies. It also introduces the soundrecording capabilities of a computer, allowing the user to record his own voice and compare the sounds to those of the program.

As one starts the program, a screen shows a table of contents. There are 32 chapters in the program. These lessons cover from *arriving to an airport, changing money* to *visiting a pharmacy*. The user can click on any of the pictures in the table of contents which sends him to the introduction screen of that lesson. There is a Quicktime™ movie which the user can click on. It is only a fun introduction movie clip with music showing a scene of the lesson one is about to learn. Unlike Professor McGinn's program where the movie is relevant to the exercises, this is just a cute movie. The quality of it, like the rest of the Quicktime™ movies, is not very good, and it is in some cases very slow.

After playing with the mouse a little there is a hidden menu bar that is revealed when one clicks on the top of the screen. This menu takes you to specific drills, instead of going screen by screen; it is very poorly designed, and too well hidden.

The vocabulary screen comes next and it shows vocabulary which the user can click on and listen to. A Quicktime™ movie shows an individual saying the word. There is also a recording palette embedded into the program, where, after going through the process of learning the vocabulary, the user can use for expressive practice and feedback. After clicking on the right-pointing arrow on the screen, the user is taken to the vocabulary drill screen. This helps the student master the new vocabulary in written and spoken form. In the next screen there is a story which helps the user comprehend spoken Spanish and, practice saying longer Spanish sentences. The *action screen* provides a continuation of the story presented in the previous screen. It gives the user practice in watching and listening to native speakers of Spanish at normal

speeds. In the *listening skills screen* the student practices understanding spoken and written Spanish, as well as writing it. This he does by typing in the correct form of the word in a blank space. The *exercise screens* include: Fill in the blanks, drag and match, word jumble and fun activities which test the user on what they have just learned. Although the exercises are very creative, the graphic aspects leave a lot to be desired. They are poor, sketchy drawings. However, those who are not graphically oriented would be fascinated by this innovative program.

There is also substantial feedback which the user receives if he or she does something that is not right. It is a good first step, since it combines visual, listening and oral exercises that are important in any language teaching program.

# ESPANOL FACIL

This program was created to evaluate how important graphics and color really are in the process of learning a foreign language. With the possibility of becoming a teaching tool in the future, the prototype of both the black & white and color programs were created with only five words. These words started with vowels, which are very important in the Spanish language.

The procedure employed was as follows: Students were pre-tested on the five words, they were then given a period of 15 minutes each to try the program. After they had tried the program they were administered a post-test on the five words. The results of both were later compared to see how effectively they learned the five words.

In preparing for this project there were many possible questions to address: Would the user learn the five words for the mere fact that the program was on a computer? Would they be attracted by the colors? Would they be invited to use the program again, and again? As they test the programs would they feel more comfortable using a computer? Would they feel overwhelmed and not want to use the computer?

In analyzing both programs it is obvious that the color program of *Español Fácil* is more appealing, but would this be enough to make the user want to go back? Will the user even notice the graphics? Would they be concerned with other factors like speed, enjoyment, etc? In reviewing these concerns, I concluded that I should be more concerned with motivation than in learning. This is why I created two programs....to be able to make the following comparisons: Will they be more motivated to learn in one than in the other? If so, what are the elements that differentially motivate the learning?

Following is a description and illustration of the color and black and white programs employed.

## COLOR VERSION

Spanish is a very colorful language. As you listen to the language, you are reminded of movement, dynamism, .... It also conveys many moods - fun, happiness, excitement, romance. This is why the beginning of the color program has some jazzy music, typically associated with Latin América. The dynamic beginning was created to introduce the user to a program where they will have fun.

A sense of unity is observed since each screen of the program contains the same border, colorful buttons and blue background. (See Fig. 1) In the menu bar the user is instructed, through audio (by clicking on the instructions button) , on how to use the program. (See Fig. 2 )

Visual associations are important in any language. As children are learning to speak, they are shown different objects and told what they mean: "mom", "dad", "bed", "dog", etc. *Español Fácil* was created with the same philosophy. Beginners are shown a
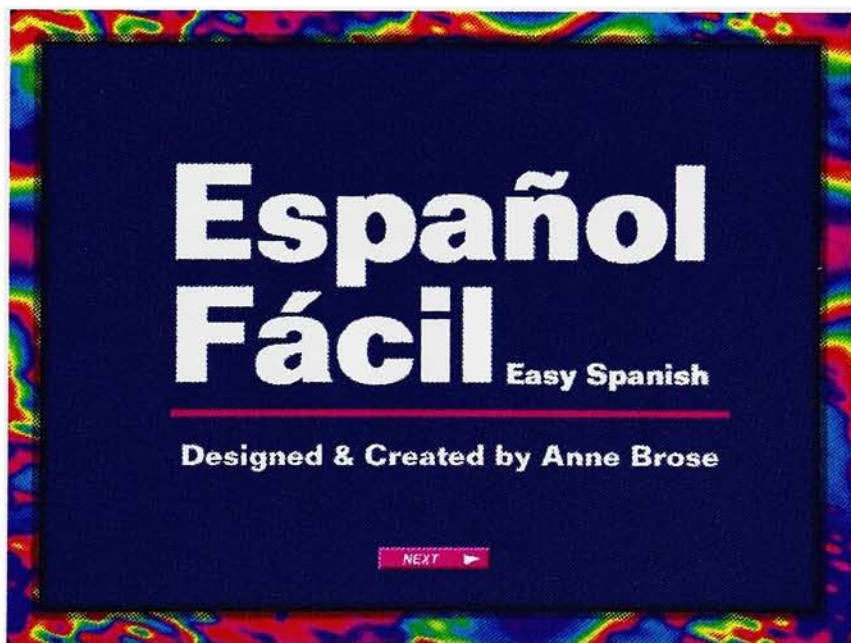


Fig. 1 – Introduction screen of program

letter, and they are able to hear the sound of the letter by clicking on a button. ( See Fig.3) If they click on the "word" button they are able to see and hear a word that starts with that letter. (See Fig. 4)

Fig. 2 - Main Menu

As the word is spoken the user will then see it visually divided into syllables. The syllable that is spoken at the moment is



Fig. 3 - Illustration of "U" vowel where user can listen to its pronunciation by clicking on the sound button.

Fig. 4 - Breakdown of word in syllables

accentuated on the screen so that it is easily identified by the listener. (See Fig. 5)
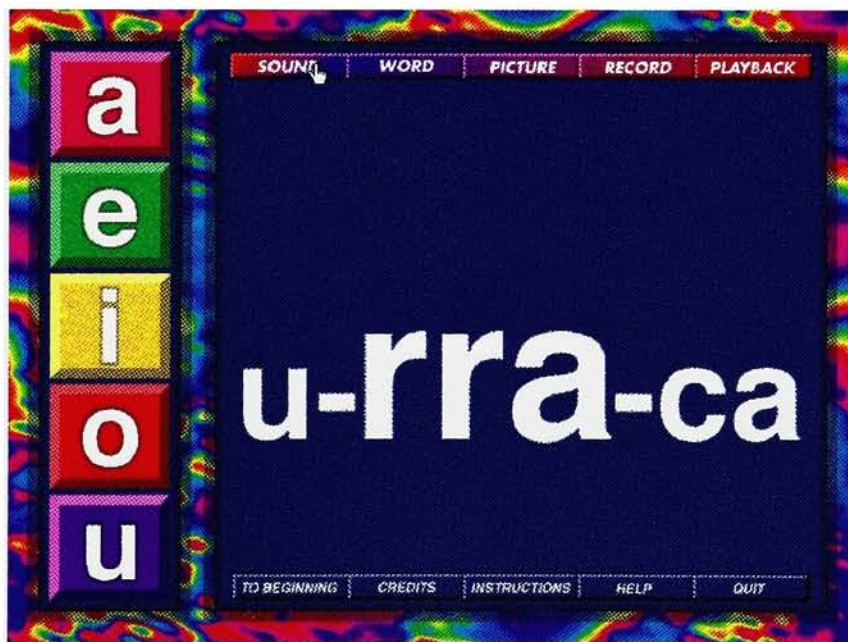


Fig. 5 - Accent representation of syllable spoken at that moment

After viewing and learning the word, the user can click on the *picture* button, where he or she is able to view the definition of

Fig. 6 - Description of word with translation button

the word by means of an illustration, creating a visual association between letter, word, sound and picture as shown in Fig. 6.



Fig. 7 - Recording palette

If the students so desire, they can record the Spanish word with their voice. This is done by clicking on the record button
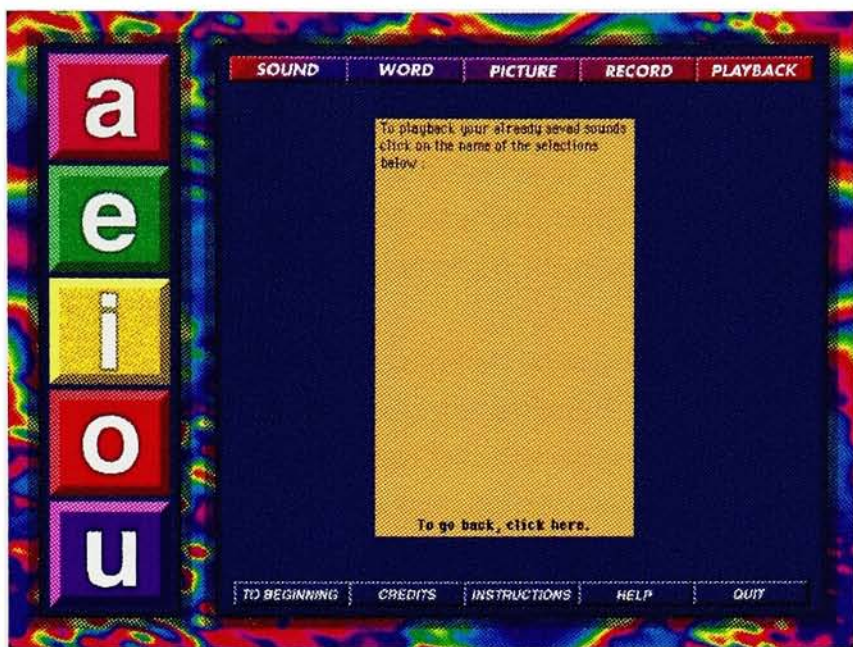
Fig. 8 - Saved recorded sound list

on the menubar. A palette, looking much like a taperecorder's interface, appears. By clicking on the record red button and
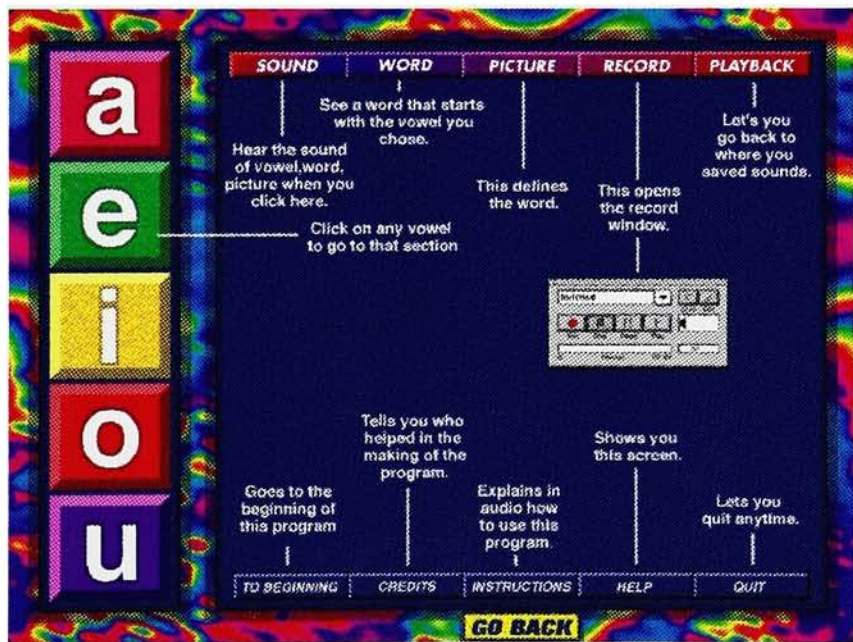


Fig. 9 - Help menu

speaking into a microphone, they can practice their speaking skills and compare with the original.

The students can also save their recorded sounds. These are placed in a list where they can go back to and compare recordings by clicking on the name of their saved sound. After they have finished using the program, the list is erased allowing newcomers to save their sounds. ( See Fig. 8)

The help button takes the user to a "Help" screen, which explains in detailed and written form the function of each button in the program. (See Fig.9)

At first, the program was created entirely in Spanish, with no English. However it was necessary to include a translation of each word in order to avoid confusion. Take the letter "U" for example. The student would click on the word button which would show them the word "urraca". As they saw the word, they saw a bird. So they assumed the definition of the word was "bird" when in reality the word "urraca" means "magpie."

I wanted to avoid the "translation" syndrome. Many people who learn a new language, try to speak it by translating their English thoughts into the language. This makes the conversation between listener and speaker more difficult. After some testing, it was necessary to include translations. It was also necessary to include the instructions and the help screen in English, since it was a beginning level Spanish program.

## BLACK AND WHITE VERSION

The black and white version of the program was created simultaneously with the color version. It teaches the exact same words as the color version, however it was created with no color and no sound in the beginning and in the introduction. There is also a difference in the layout of the buttons, and the overall look. (See Fig. 12)

At the beginning of the program the user is introduced to it by a simple text headline. There is no jazzy music like in the colored treatment. (See Fig.10) The instructions are written in simple text and the user has to follow them by reading as shown in Fig. 11

Although the graphic differences are substantial, the teaching process is similar to the colored one.The student is presented with the five vowels on the screen. As he or she clicks on it they are shown the vowel. They can click on the sound button to listen to how it is said. The same goes with the word and the picture. (See Fig. 14) Unlike the colored version, the words are not visually broken down into syllables. (See Fig. 15 )
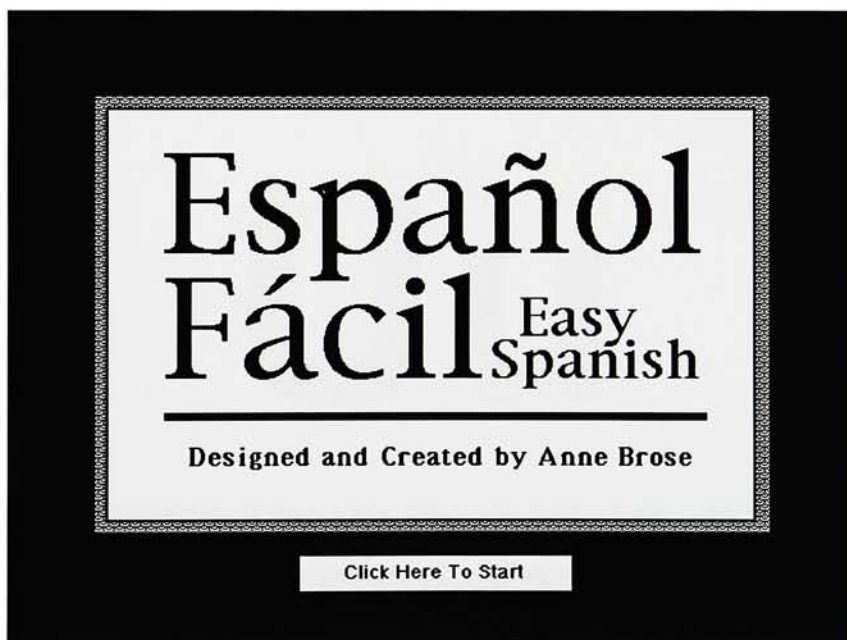


Fig. 10 - Cover of black and white version

The program also allows the student to record sounds in order to practice his or her speaking drills.

On the next section click on any of the vowels. This will take you to a section where you will learn how the vowel sounds.

There is also a record and playback button where you will be able to record your own voice and listen to how you spoke what you have learned.

You will also be taught a word beginning with the vowel you have chosen. Just like on the vowel you will be to able to listen to the word, record your version and compare both sounds.

Remember, to start, click on the next section button and before you click on any vowel, please click on the Help Menu

HAVE FUN !

Next Section

Fig. 11- Welcome to program in text form

Sounds can also be saved and reviewed, by clicking on a list where they were saved to.

| a | e | i | o | u |

Uu

Help Menu

Quit

| Sound | Word | Picture | Record | Playback |
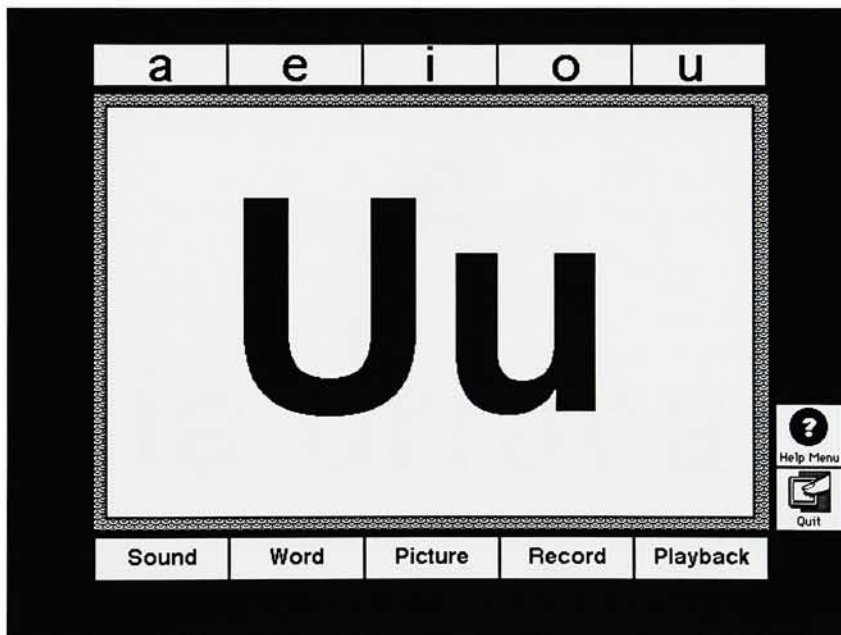
Fig. 12 - Demonstration of vowel

A help screen is also included in the program. Its presentation isn't as elaborate and specific as the colored version. The content is the same, presented in a very basic text format.(See Fig.16)
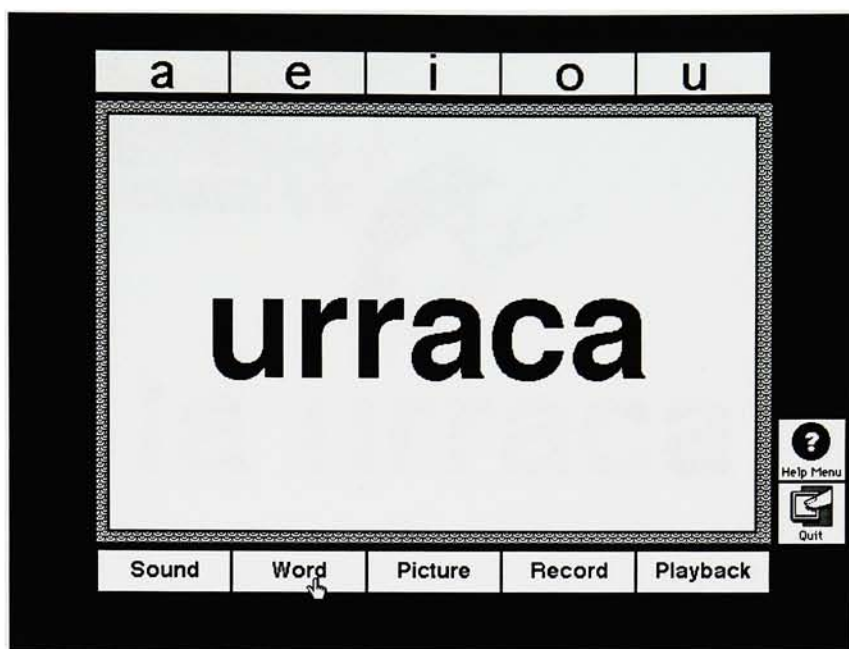
Fig. 13 - Word starting with the vowel chosen by user



Fig. 14 - Word with correct article

Fig. 15 - Recording palette
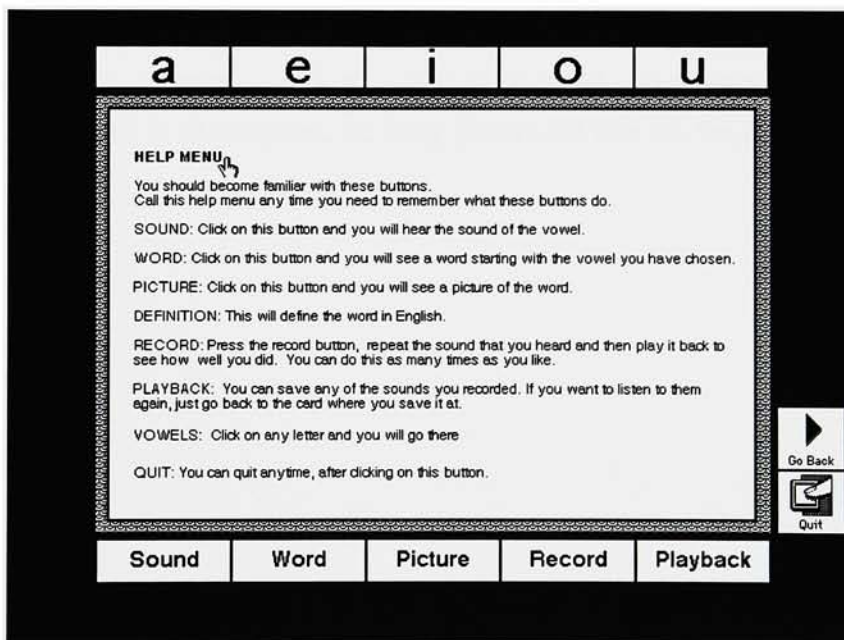


Fig. 16 - Help menu

## SOFTWARE USED FOR THE PROGRAMS

Both programs were created in HyperCard 2.2. In the colored program a MacroMind Director movie was included. I had more familiarity with the scripting in HyperCard 2.2 than Macromind Director and felt more comfortable with the program. I was also fascinated by the new developments with the program, especially the recording capabilities and importing pictures without writing " scripts and or using XCMDS.

HyperCard 2.2 did have some drawbacks however, such as color which makes the program run very slowly. Through my scripting, everytime a user clicked on a button, the screen was redrawn. In order to give it that visual clicking effect: a darker button has to be placed over the lighter one and then the whole screen had to be redrawn in order to eliminate the darker button. (I soon discovered that this was much more easily done in MacroMind). After many trials and tribulations and some simple scripting I was able to make both stacks work.

Most of the graphic images were created in Photoshop and then imported into the program. The illustrations describing each word were done by a senior illustrator at RIT whose style I really like and thought was perfect for the project. My strengths were definitely not in illustration, so Amy Swan did the job for me.

# TESTING THE "ESPANOL FACIL" PROGRAMS

## THE HIDDEN FIGURES TEST

I employed a sample of 100 students from a local Junior High School in order to test whether graphics and color contribute to the learning process of a foreign language. The students were administered the Hidden Figures Test (HFT; Witkin and Goodenough, 1981) which is a bipolar test that enabled me to separate them into two groups according to their scores.

The HFT may be used to divide a test sample into two groups: those who are field dependent and those who are field independent. The test requires the subject to find a simple figure within a complex composition. In the first 12 minutes the individual has to find 16 figures. They are then given a five minute break and they then have 12 more minutes to find 16 more figures. Those with high scores may be classified as field - independent. They are able to disembed an object from the perceptual field and view it for itself. Those with low scores, field dependents, are less able to perceive objects independent of the entire perceptual field and usually view them as part of the whole.

According to Herman A. Witkin and his fellow researchers, performance on a field dependence-independence task also shows that subjects are markedly different in their performance of orientation tasks. They perceive and view things differently when doing different tasks.[7] In addition " an extensive body of research on interpersonal behavior has shown that people who are field independent in perception" usually "function more autonomously of others than do field-dependent people." [8]

Previous research has also shown that "field-dependent people, compared to field-independent ones, show more of the social behaviors, attributes, and habitual ways of reacting likely to contribute to facility in getting along with others..." [9] As an example of how performance on the HFT reflects differences in personality, a study showed that students who were good in psychiatric nursing were usually field dependent, whereas those who were good in surgical nursing were relatively field independent. The explanation

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7  Witkin & Goodenough, p. 36
8  Witkin & Goodenough, p. 38
9  Witkin & Goodenough, p. 44

given was that psychiatric nursing relies more on relations; surgical nursing, however, depends on "cognitive restructuring skills." [10]

The HFT was ideal for my research purposes. It divided my sample into two groups of individuals with differing perceptual orientations which were hypothetically pertinent to the difference in the two programs.

In order to evaluate the numerical data acquired through the testing and arrive to some clear conclusions, subjects were categorized within each of the black and white and color programs as field dependent or field independent based on their HFT performance. Thus, for the purpose of analysis, there were four groups of subjects: 1) Color program, field dependents; 2) color program, field independents; 3) black and white program, field dependents; and 4) black and white program, field independents.

## PRE-TEST

The target group for the *Español Fácil* program was: beginning students who had little or no exposure, to the romance languages. The previously described sample was then administered the HFT.

In evaluating the scores between the first and second parts of the HFT we found significant differences. The scores were higher for the second part, possibly because the subjects had become accustomed to the task.

After they completed the HFT they were administered a questionnaire and the Spanish pre-test. The questionnaire asked them about computers, whether they had used one or not, and if they had taken any courses on computers. The Spanish test employed a "match the word in English" format. The students had to match the English equivalent of the Spanish words. Among the 10 words asked, five of them were included in the *Español Fácil* program.

The overall results of the Spanish pre- test showed a mean of .487 words correct. Forty-six didn't know any of the five words, 25 knew one of the words, four knew two words and one knew four.

Nobody knew all five and the vast majority (93.4%) knew one or none of the five words that they were tested on. This indicates that the subjects did not know the Spanish words employed before they were administered their program.

The questionnaire revealed that, of the 45 students in the black and white program, nine didn't take the pre-test and 36 had previously used a computer. They also liked learning with a computer; the majority said they were fun and about 10 said they helped them learn better. Two of the 36 said they liked learning with computers but also disliked them because they were confusing. Thirty-six of this group also said that they had taken some Spanish; three of these had in addition taken some French class and one had taken an arabic course.

Of the 55 students who tried the color treatment, 12 didn't take the pre-test, and 42 had previously used a computer. Six of the 42 students agreed that computers were fun to use, eight said they made things easier, four said they were interesting and four thought computers helped them learn better. The 43 students also indicated that they had taken some Spanish, and three of these 43 had in addition taken French.

## ESPAÑOL FÁCIL Testing:

After they had taken the HFT and the Pre-Test, students were assigned to the black and white or color treatments using a stratified random assignment procedure where the same HFT scores were represented in each, giving an equal and fair division between the groups.

The testing took place in the Spanish classroom of the Filmore Central School. I had taken my own personal computer, and fortunately the professor Mrs. Kathy Moore had the same model at her home which she gladly loaned for the study. The computers were placed in opposite sides of the classroom. The one with the color program was covered by the screen for privacy purposes. A set of headphones was provided to each student in order to avoid distractions.

The testing took place for five consecutive days. There was a time limit of 15 minutes per student and they were told before-

hand that the objective of them trying the programs was to learn the five words that were being taught.

There were only two students in the classroom at the same time, while the rest of the class went to the library or studyhall. Even though there were only two students present at a time, they both seemed to feel self conscious of each other, and in many cases they didn't try the recording aspect of the program.

After the third day there were more students recording their voice, especially when they thought it was an act of bravery, and they could tell their classmate they had done it. In other cases, when students discovered the recording aspect of the program, they went over and over the word again. Both programs worked without major problems.

Students trying out the black and white program had more difficulty following instructions, and they needed much more assistance than the students who used the color program. They had to read the instructions, where in the color they had a recording telling them what to do.

The following anecdotes give an idea as to some of the reactions students had while testing the programs:

A junior level student felt no qualms about recording in the black and white program, and did so repeatedly. He really enjoyed working on the program. Unfortunately when it came to answering the post-test he was unable to match the Spanish words to the English words. I asked him if he could try the colored program. After 15 minutes and another post-test he matched the words perfectly. However he did confess he felt pressured to learn the five words. He didn't feel the colors or graphics helped better, but he did say that the division of syllables helped him remember the words better. Another student also tried both treatments, and responded in a similar way.

In many cases students were anxious to try the program as fast as they could so that they could go outside with their classmates. Another student, who is considered a troublemaker said "this is fun" and didn't want to quit. He was working on the color program.

Students testing the black and white program had to be led through the recording instructions, mainly because the instructions were in text form, and it seemed that they were anxious to get going, and didn't want to take the time to read.

## POST TEST

After the students had finished working their program they were administered a questionnaire where they could comment on the programs they had each tried. At the end of the questionnaire was the same "match the words in English" that I had given out in the pre-test. This would allow me to compare the answers.

Following are the results of the post-test taken by the students after they had tried the black and white or color program. Overall, the mean number of correct words was 4.1. Fifty-four knew five of the words; 13 knew four of the words; 17 knew three words; and five knew two. In conclusion, 65.6% of the students who took either program learned four to five words.

| | Black & White | Color |
|---|---|---|
| Post-Test | 4.21 | 4.11 |
| Pre-Test | .27 | .68 |

**COMPARISON BETWEEN POST AND PRE-TEST**

Fig. 22 - Mean number of correct words pre and post for each program

These results show that there was improvement in the learning process. However there was no indication that learning the five words was better achieved in either the black and white or the color program. Figure 22, which shows the mean number of correct words pre and post for each program, demonstrates this.

The near maximal performance on the post-test for both programs (4.21, 4.11 out of a possible five ) suggests a ceiling effect. That is, the test many not have been difficult enough to demonstrate possible differences between the programs. Analysis of the post-test was also performed for field-dependent and field independent within each of the two programs. No significant differences were observed.

The qualitative answers of the post-test may provide useful information as to what the students thought of each program. Most of the feelings toward both programs were positive. Of the 46 students who tested the black and white program, two didn't take the post-test; 42 liked the program. The majority said it needed more words, six said they liked the pictures, one recommended color be added to it, four thought it was fun, 14 said it helped them learn the language better. A few of the students felt self conscious about recording and didn't do it.

As for recommendations on their part, six suggested color be added, seven said more words should be included, four said animation would be fun, a couple thought better instructions were necessary and, finally two said there should be music in the program.

Of the 55 students who tried the colored program three didn't take the post-test. The majority did say they liked the program. Eight students said they liked the pictures; five agreed they liked the sound; four students liked the recording aspect of the program, one didn't like it because he felt intimidated; four students liked the colors.

Recommendations were also asked of these students: 18 said words had to be added to the program, (an answer that was expected), some said words should be placed in a sentence, two said animation should be included. As an interesting recommend-dation four students suggested a testing game be added at the end of the program.

The overall reaction to both programs was quite positive, and students had fun trying them out, whether it was the black and white or the colored program.

# CONCLUSIONS

Taken together, the results indicate no difference in learning due to the black and white versus the color program. Both programs produced near maximal learning performance on the post-test employed. This is a possible explanation for the lack of expected difference in favor of the color program. It may be that a more difficult post-test would have allowed possible differences to emerge.

A second possible factor which may have overridden differences between the programs is that students may have been enamored with the use of the computer. This, in and of itself may have so boosted performance due to the black and white program that the expected superiority of the colored program was thereby obscured.

A similar study took place in Iowa. Mr. Francis Dwyer and David Moore conducted a study with a sample of 119 students. The purpose was to research the effect black and white or color had on field dependent and field independent individuals. The program the students tested however had "2,000 word instructional booklet on the anatomy and functions of the human heart with 19 illustrations designed to illustrated content being presented verbally." [11] These illustrations were presented in black and white to one group, and in color to the other.

The results of that research indicated that color was an important instructional variable for the stimulation of those students who were field dependent. For those who were field independent, color was not relevant in maximizing their learning process.
I firmly believe that students were motivated by the fact that they were using a computer to learn the program. No matter what personality they had: shy, introvert, quiet, loud, etc. they all seemed to enjoy the fact that they were using a computer.

Gordon B. Browning (Supervisor of Pupil Services for the Kent County Public Schools in Maryland) once wrote that each child is unique - they all come from different backgrounds and

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11   Dwyer, F.; Moore, David N.

experiences and it's really difficult to generalize that students learn better this way or the other. He does believe that computerized education has been positive in the teaching world. Since it's difficult to teach students on an individual basis, computers allow for students to learn on their own, the best way they can. For those who are slow in class, it allows them to catch up with the information given in class. Mr. Browning has also seen students spend hours "with simulation software learn ecology, economics, chemistry, sociology and long range planning skills." [12]

For the majority of students, learning on the computer is highly motivating; it offers sufficient practice opportunities and incredible positive feedback. But is it the computer alone that stimulates? This is a question suggested by but unanswerable by the present work.

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## SOFTWARE USED FOR THE DEVELOPMENT OF PROGRAM

Photoshop 2.5.1
Kai's Power Tools
SoundEdit Pro
MacroMind Director 3.1
HyperCard 2.2

# Appendix

**APPENDIX I**

**PRE-TEST**
**Student Name**

_____

Date _____   Class Section _____
Dear Student: Please answer the following questions about computers.

1. Have you used a computer before?

_____

   If yes, how many years have you used a computer?

_____

2. What kind of computer(s) have you used?
   Mac_____ PC _____ Other (Please specify) _____
3. Where did you learn about computers? HOME _____
   SCHOOL _____
4. Do you like learning with computers ? _____
   Why, or why not _____
5. In which classes do you use computers?

Please answer the following brief questions about languages:
1. Which of the following language classes have you taken? :
   SPANISH _____ ITALIAN _____ FRENCH _____
   OTHER (Please specify) _____ NONE _____
2. If you have taken a language class did you use any programs on the computer?
YES _____ NO _____
3. If yes, do you believe the computer program helped you learn the language better/ faster?

_____

Why or why not?

_____

**Page 2 of Pre-Test**

## 4. PLEASE MATCH THE FOLLOWING SPANISH WORDS WITH THE ENGLISH WORDS:

| | |
|---|---|
| la araña | the magnet |
| el enano | the nail |
| la oreja | the desk |
| la iglesia | the sandwich |
| las uvas | the ear |
| la urraca | the bear |
| el automóvil | the grapes |
| la abeja | the rug |
| el imán | the magpie |
| el azúcar | the church |
| el oso | the dwarf |
| la uña | the car |
| el escritorio | the bee |
| la alfombra | the spider |
| el emparedado | the sugar |

Thank you  very much for filling out this questionnaire!

**APPENDIX II**

<u>**POST-TEST**</u>

**STUDENT NAME** _____

**DATE** _____          **CLASS/SECTION** _____

**Dear Student:  Please answer the following questions as honestly as you can:**

**Which program did you try?  Black and White program _____**

**Color program _____**

**What did you think of the Spanish program you tried?**

**What did you or didn't you like about it?**

**Did you find it easy to use?**

**Do you think the instruction were clear and easy to follow?**

**Was there anything in the program that you specifically liked or didn't like?**

**If you could design the program what would you add to it / or take away from it?  ( Be creative)**

**Page 2 of Post-Test**

**4. PLEASE MATCH THE FOLLOWING SPANISH WORDS WITH THE ENGLISH WORDS:**

| | |
|---|---|
| la araña | the magnet |
| el enano | the nail |
| la oreja | the desk |
| la iglesia | the sandwich |
| las uvas | the ear |
| la urraca | the bear |
| el automóvil | the grapes |
| la abeja | the rug |
| el imán | the magpie |
| el azúcar | the church |
| el oso | the dwarf |
| la uña | the car |
| el escritorio | the bee |
| la alfombra | the spider |
| el emparedado | the sugar |

**Thank you very much for filling out this questionnaire!**

## HIDDEN FIGURES TEST — CF-1 (Rev.)

This is a test of your ability to tell which one of five simple figures can be found in a more complex pattern. At the top of each page in this test are five simple figures lettered A, B, C, D, and E. Beneath each row of figures is a page of patterns. Each pattern has a row of letters beneath it. Indicate your answer by putting an X through the letter of the figure which you find in the pattern.

NOTE: There is only one of these figures in each pattern, and this figure will always be right side up and exactly the same size as one of the five lettered figures.

Now try these 2 examples.
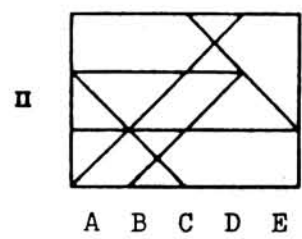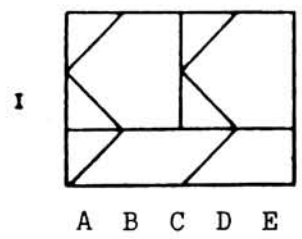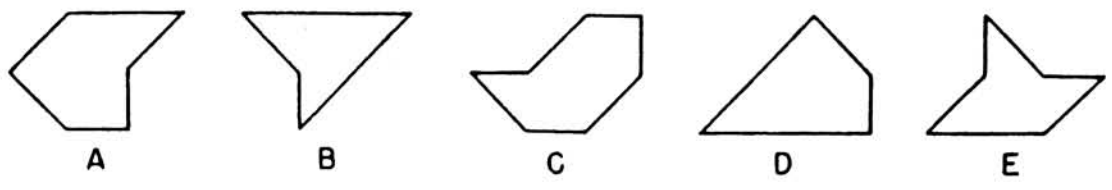


The figures below show how the figures are included in the problems. Figure A is in the first problem and figure D in the second.
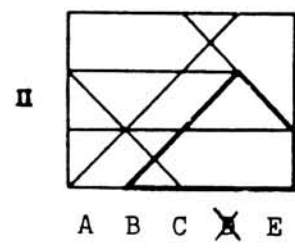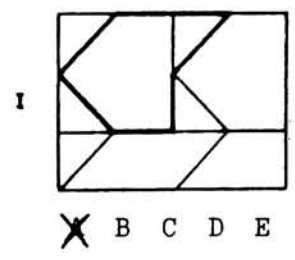


Your score on this test will be the number marked correctly minus a fraction of the number marked incorrectly. Therefore, it will not be to your advantage to guess unless you are able to eliminate one or more of the answer choices as wrong.

You will have 12 minutes for each of the two parts of this test. Each part has 2 pages. When you have finished Part 1, STOP. Please do not go on to Part 2 until you are asked to do so.

DO NOT TURN THIS PAGE UNTIL ASKED TO DO SO.

## Part 1 (12 minutes)



A    B    C    D    E

---

1. 

A   B   C   D   E

2. 

A   B   C   D   E

3. 

A   B   C   D   E

4. 

A   B   C   D   E

5. 

A   B   C   D   E

6. 

A   B   C   D   E

7. 

A   B   C   D   E

8. 

A   B   C   D   E

9. 

A   B   C   D   E

GO ON TO THE NEXT PAGE
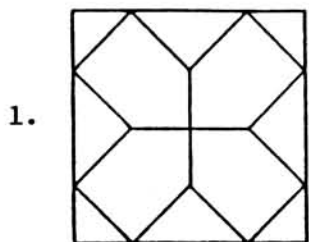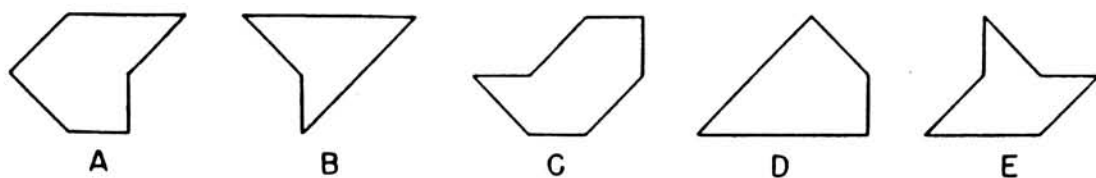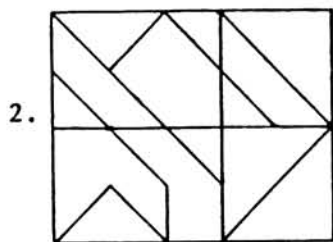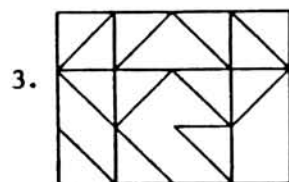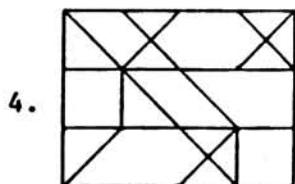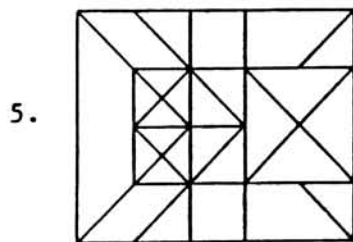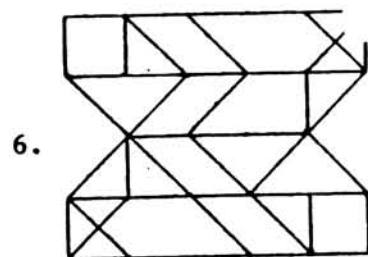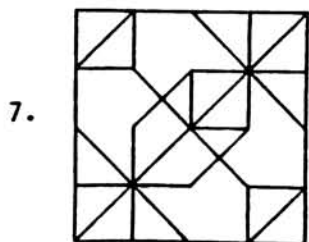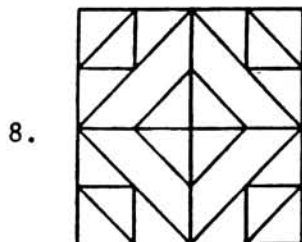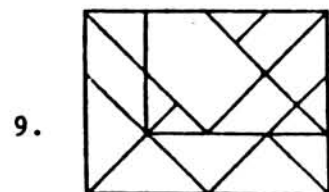
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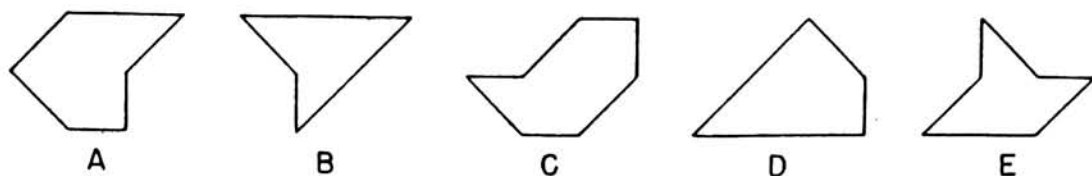


A    B    C    D    E

10.
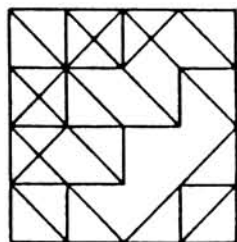


A   B   C   D   E

11.
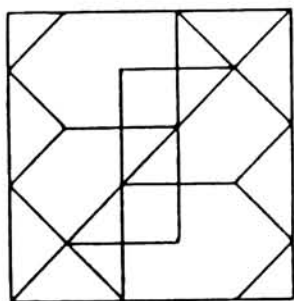
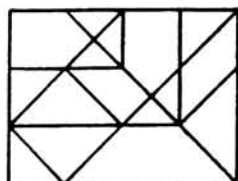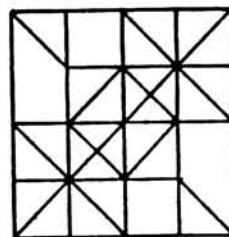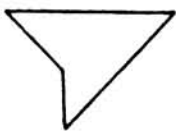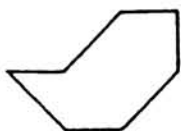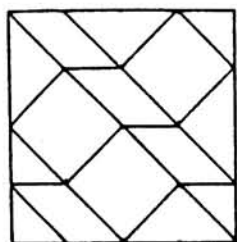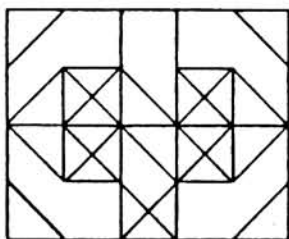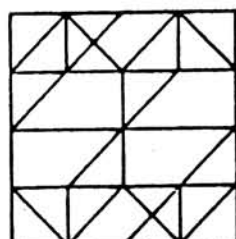

A   B   C   D   E

12.
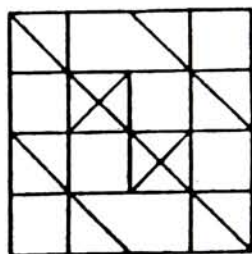


A   B   C   D   E

13.
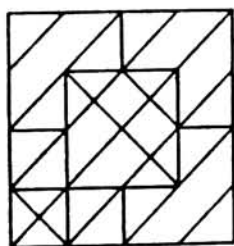


A   B   C   D   E

14.



A   B   C   D   E

15.



A   B   C   D   E

16.



A   B   C   D   E

DO NOT TURN THIS PAGE UNTIL ASKED TO DO SO.
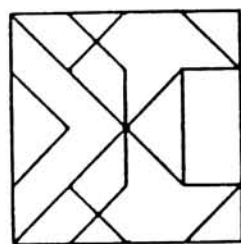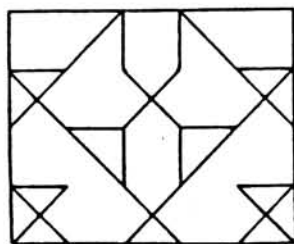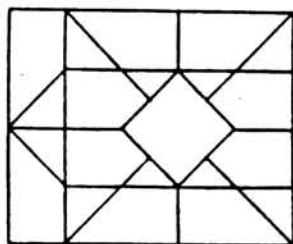
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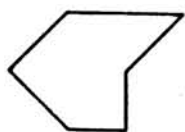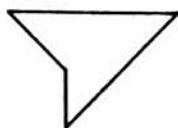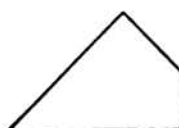
A   B   C   D   E

17.
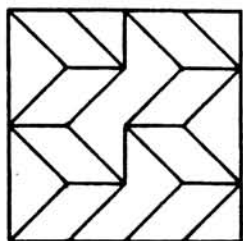
A B C D E

18.
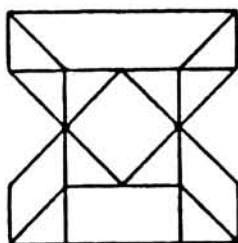
A B C D E

19.
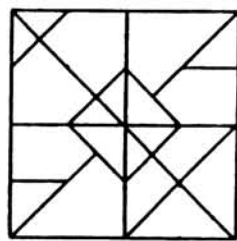
A B C D E

20.
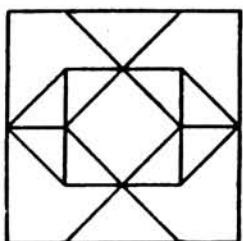
A B C D E

21.
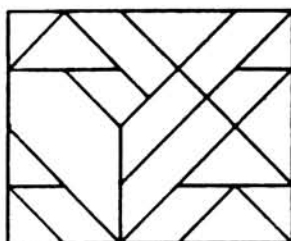
A B C D E

22.
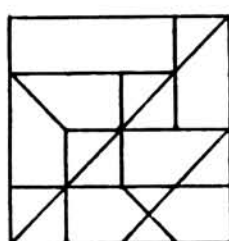
A B C D E

23.
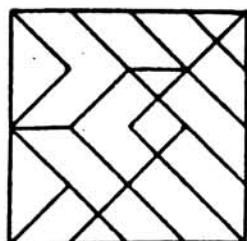
A B C D E

24.

A B C D E

25.

A B C D E

GO ON TO THE NEXT PAGE

## Part 2 (continued)
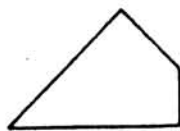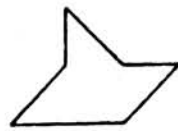


A    B    C    D    E
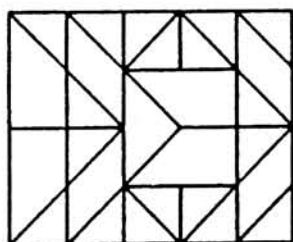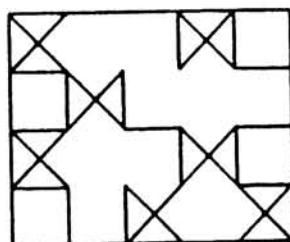
---

26.


A  B  C  D  E

27.


A  B  C  D  E

28.


A  B  C  D  E
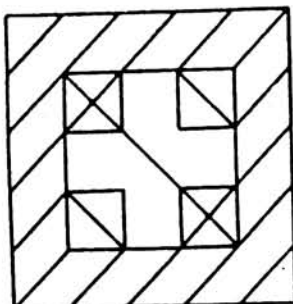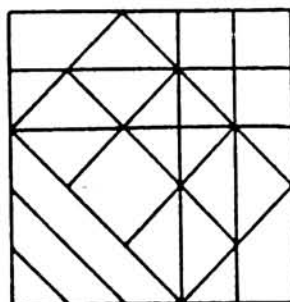
29.


A  B  C  D  E

30.


A  B  C  D  E

31.


A  B  C  D  E

32.


A  B  C  D  E

DO NOT GO BACK TO PART 1, AND
DO NOT GO ON TO ANY OTHER TEST UNTIL ASKED TO DO SO.

STOP.