

## A Nonanthropomorphic Style Guide: **Overcoming the Humpty Dumpty Syndrome**

*by*  
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A savvy 16-year-old informed his naive friend that "the computer knows about the AUTOEXEC file." Unimpressed, the naive friend asked, "Can it solve my math homework problems?"

### **Computer Talk**

There is a great temptation to talk about computers as if they were people. It is a primitive urge that children and many adults follow without hesitation. Children will readily accept human-like references and qualities for almost any object, from Humpty Dumpty to Tootle the Train. Adults reserve anthropomorphic references for objects of special attraction such as cars, ships, and computers.

Unfortunately, the words and phrases used when talking about computers can make important differences in people's perceptions, emotional reactions, and motivation to learn. Attributing intelligence, independent activity, free will, or knowledge to computers can mislead the reader or listener.

The suggestion that computers can think, know, or understand may give children an erroneous model of how computers work and what their capacities are. For example, bank terminals that ask, "How can I help you?" suggest more flexibility than they deliver. Ultimately the deception becomes apparent, and the user may feel poorly treated. A more realistic description of computers' capabilities may help children grasp the potential uses of computers and increase trust in their teachers, possibly increasing their motivation to learn.

A second reason for nonanthropomorphic phrasing is that it is important for children to have a clear sense of their own humanity. They need to know that they are different from computers, and that relationships with people are different from relationships with computers. They may learn to control computers, but they must respect the unique desires of individuals. The dual images of computer as executer of instructions and anthropomorphized machine may lead children to believe that they are automatons themselves. This undercuts their responsibility for mistakes and for poor treatment of friends, teachers, or parents. It is important to remind children that they have control over their lives (even if there are limitations). Blurring the boundary between computers and people may undermine a child's emerging sense of self (Turkle, 1984).

Third, because children can benefit from using computers, designers should make them accessible. An anthropomorphic machine may be attractive to some children but anxiety producing or confusing for others. Instead of suggesting that computers are like people, presenting computers through the powers that they offer may be the strongest stimulus to learning. As children become engaged, excited, and empowered, the com-

puter becomes transparent and they can concentrate on their writing, problem solving, or exploration. They recognize that the product is a result of their own effort, not that of some magical machine.

Although children, and some adults, may be seduced by the anthropomorphized computer, eventually they seem to prefer the sense of mastery, internal locus of control, competence, and accomplishment that can come from understanding the computer's real abilities.

These arguments are largely subjective and express my personal view about valueladen issues in discussing computer systems, but empirical data is beginning to emerge. In an experiment with 26 college students, the anthropomorphic design ("HI THERE, JOHN! IT'S NICE TO MEET YOU," "I SEE YOU ARE READY NOW.") was seen as less honest than a mechanistic dialog ("PRESS THE ENTER KEY TO BEGIN SESSION.") (Quintanar, Crowell, and Pryor, 1982). In this CAI task, subjects took longer with the anthropomorphic design-possibly contributing to the improved scores on a quiz-but they felt less responsible for their performances.

In a study of 36 junior high school students, conducted under my direction, the style of interaction was varied (Gay and Lindwarm, 1985). Students worked on a CAI session in one of three forms: I ("HI! I AM THE COMPUTER. I AM GOING TO ASK YOU SOME QUESTIONS."); you ("YOU WILL BE ANSWERING SOME QUESTIONS. YOU SHOULD...."); or *neutral* ("THIS IS A MULTIPLE CHOICE EXERCISE."). Before and after each session at the computer, subjects were asked to describe whether using a computer was easy or hard. Most subjects thought using a computer was hard and did not change their opinion, but of the seven who did change their minds, the five who moved toward hard-to-use were all in the I or *neutral* groups. Both of the subjects that moved toward easy-to-use were in the you group. Performance measures on the tasks were not significantly different, but anecdotal evidence and the positive shift for you group members warrant further study.

I used these ideas when I wrote a book for my third-grade daughter and her friends (Shneiderman, 1985). I wanted them to learn problem solving skills and some aspects of BASIC programming while experiencing how programming applies to playful and practical problems. In the text I was careful to present the computer in a mechanical way and to emphasize the task the reader was doing.

The artwork carries this same theme; there are no dancing robots or computers with faces. The computer is portrayed as a tool to help children reach their goals in examples such as recipe portion computations, counting minutes of piano practice, learning arithmetic, or writing a story. The artwork shows the computer as a tool or a fantasy machine: The computer becomes a piano, abacus, car, or spaceship.

The following examples illustrate how authors and teachers might present computers in a nonanthropomorphic style.

In discussing computers, avoid verbs such as: ~  
know, think, understand, have memory (POOR).  
In their place use more mechanical terms such as:

process, print, compute, sort, store, search, retrieve (BETTER).

When describing what a child does with a computer, avoid verbs such as:

ask, tell, speak to, communicate with (POOR)

In their place use terms such as:

use, direct, operate, program, control (BETTER).

Still better is to eliminate the reference to the computer and concentrate on what the child is doing, such as writing, solving a problem, finding an answer, learning a concept, or adding a list of numbers.

Here are some examples of poor (but commonly used) phrases and their better counterparts.

POOR: The computer can teach you some Spanish words.

BETTER: You can use the computer to learn some Spanish words.

Make the user the subject of the sentence.

POOR: The computer will give you a printed list of animals.

POOR: Ask the computer to print a list of animals.

BETTER: You can get the computer to print a list of animals.

EVEN BETTER: You can print a list of animals.

The last sentence puts the focus on the user and eliminates the computer.

POOR: The computer needs to have the disk in the disk drive to boot the system.

BETTER: Put the disk labeled A2 in the disk drive before starting the computer.

EVEN BETTER: To begin writing, put the Word Processor disk in the drive.

The last form emphasizes the function or activity that the user is going to perform.

POOR: The computer knows how to do arithmetic.

BETTER: You can use the computer to do arithmetic.

Focus on the child's initiative, process, goals, and accomplishments.

Remember, computers have no more intelligence than a wooden pencil.

### **Software Suggestions**

The same principles apply to computer software (Shneiderman, 1987): Software designers and evaluators should be alert to phrasing and choice of words. The anthropomorphic computer that uses first person pronouns may be counterproductive because it deceives, misleads, and confuses. It may seem cute on first encounter to be greeted by "I AM SOPHIE, THE SOPHISTICATED TEACHER, AND I WILL TEACH YOU TO SPELL CORRECTLY " but by the second session this approach feels uselessly repetitive. By the third session it is an annoying distraction from the task.

The alternative for the software designer is to focus on the user and use second person singular pronouns or to avoid pronouns altogether.

POOR: I will begin the lesson when you press RETURN.

BETTER: You can begin the lesson by pressing RETURN.

BETTER: To begin the lesson, press RETURN.

I prefer the *you* form for introductory screens because it is more personal and engaging and it emphasizes the user as initiator. But once the session is underway I reduce the number of pronouns to avoid distracting from the material. For young children a fantasy character such as a teddy bear or a busy beaver can be a useful guide through the material. A cartoon character can be drawn and possibly animated on the screen to add visual appeal.

Well-chosen words and phrases make a difference in dozens of places, for example, in menu choices, instructions, prompts to remind users of available commands, on-line assistance screens, and on-line tutorials. Successful designers carefully test alternatives and continually refine their decisions.

I strongly believe that software designers should put their names on a title or credits page, just as authors do in a book. The credits are an acknowledgement for the work done, and they identify those responsible for the contents. In software there is the additional motivation of making it clear that people created the software and the computer is merely the media. Software design is a complex, highly creative process, and designers may try a little bit harder to create a good product if they know their names will appear.

Educational computer software is a new domain. The criteria here are meant to promote high quality software that serves the user's needs. As with any initial set of suggestions or guidelines, these need to be validated through empirical studies, refined for different situations, and extended to cover more situations.

As computers and software become more powerful, they become more empowering. We can help our students gain a sense of control by attributing the power to the user.

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