

# **Hairy Questions: The Difference a Bearded Instructional Character Makes to Middle School Students**

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## **Introduction**

There's no keeping up with what teenagers think is in or out; status changes by the minute. But when you develop computer-based instruction (CBI) for that population of users, you'd like to know with some reliability that the program is in. At the least, you'd like to know that users won't respond by rolling their eyes.

Such was the case with a CBI program designed for a nonprofit organization that demonstrates the firing of a civil war cannon for middle school and high school students. The organization wanted to distribute a CBI program to schools so students would have background knowledge about the cannon before watching the firing demonstration. The program designer decided on a character-mediated approach to instruction, with the character being modeled after the man who performs the demonstration. That man is a jovial older man who wears a beard and a replica of a Union uniform; the CBI program character, called Sarge, is a line drawing in his likeness.

Preliminary program reviewers—adults—hypothesized that Sarge's beard might negatively affect students' responses to the character. Tobin (2000) conducted a phenomenological study of children's generalizations about good and bad characters in the movie *The Swiss Family Robinson*. He found that children identified the movie's bad guys, in part, by their inferior personal grooming. However, within a Civil War context, the stereotypical good guy certainly might have grown a little scruff on his face after months on the march.

Stereotypes might be crucial to interpreting a character's purpose in a CBI program (Laurel, 1997). However, internalizing a culture's shared expectations for archetypical characters is a developmental process (Applebee, 1978; McKown & Weinstein, 2003). What might represent grizzly authenticity to an adult CBI designer might represent wizened obsolescence to a teenager. To investigate what a beard might mean to students both within a Civil War context and apart from that context, the researchers surveyed middle school students about their responses to both a bearded Sarge and a clean-shaven Sarge.

Research questions are as follows:

- Would students rather have a bearded or beardless character teach them about the Civil War? Are there any grade level or gender differences?
- Do students perceive a bearded or beardless character as more friendly? Are there any grade level or gender differences?

Research by Reeves indicates that friendliness is an essential dimension against which most people measure characters (Reeves & Greenberg, 1977; Reeves & Nass, 1996).

## **Method**

### **Subjects**

Subjects were 644 fifth- through eighth-grade students in a suburban middle school in an upper-middle class community in a northeast state.

### **Materials and Measures**

This study used a two-item survey posing these questions: "Who would you prefer teach you about the Civil War?" and "Who do you think is the friendliest?" For each question, students chose between two drawings of Sarge that differed only by the presence of a beard (see Figure 1). In addition, the survey collected information about the students' grade levels and genders. The surveys included a written introduction explaining that a college student was designing an instructional program for the computer and that the college student needed their help in deciding on a main character for the instruction.

Four forms of the survey counterbalanced question order and the order in which the two drawings appeared.

## Procedures

For grades six and seven, a school administrator distributed an envelope containing 25 survey instruments to teachers during a teacher meeting at the beginning of the school day. Survey instruments were arranged systematically so that the four counterbalanced survey forms would be dispersed evenly among students in each classroom. Surveys were distributed to students during the first class of the school day and returned to the school administrator after the first class. Prior to administering the survey, the teacher read aloud to the class the survey's written introduction. Students were given ten minutes to complete the survey.

For grades five and eight, the same school administrator distributed the surveys to each class and followed the same procedures as the sixth- and seventh-grade teachers. The administrator collected the surveys immediately after completion.

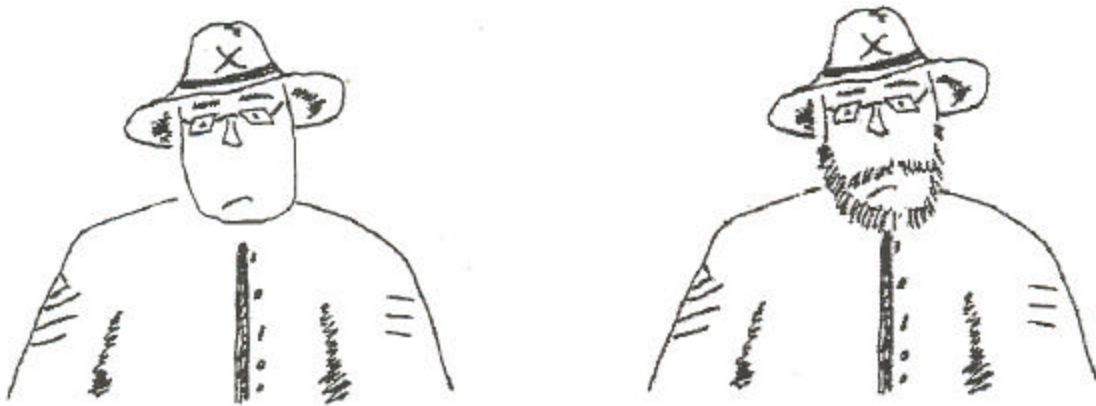


Figure 1. Beardless and bearded drawings of the computer character called Sarge.

## Design and Data Analysis

This study used a two-way design, with gender and grade level serving as status variables. Character choices (i.e., bearded Sarge and beardless Sarge) were coded as zeros and ones, with a zero representing a preference for the character without a beard and a one representing a preference for the character with a beard. Therefore, mean scores for the dependent variable could be interpreted as the percentage of students selecting the bearded character. Binomial tests were run to determine if the preference proportions differed significantly from the chance level of .50. Binomial tests were conducted for the entire sample and for each level of the gender and grade level variables within the separate question contexts.

To assess the effects of grade level and gender on students' preferences for a bearded character, the researchers used 2 (gender)  $\times$  4 (grade level) analyses of variance (ANOVAs) with gender and grade level as between-subjects variables. Analysis of dichotomous data in this manner has been shown to be justified by the robustness of ANOVA (Glass, personal communication, February 24, 2004; Glass, Peckham, & Sanders, 1972). Those ANOVAs were run for each of the two survey questions. The inclusion of question context as an independent variable in those ANOVAs would have complicated the interpretation of any gender or grade level effects. Therefore, the difference between survey questions (or question contexts) was analyzed separately, with a paired-samples *t*-test. Because of the number of analyses,  $\alpha$  was set at .01 for all statistical tests.

## Results

Table 1 shows the mean proportions of all students choosing the bearded character overall, within each character context, and by grade level and gender. Table 1's totals column shows that for both questions combined students chose the bearded character more frequently than the beardless character. This overall preference—54 percent of choices for the bearded character—was significantly different from chance,  $P = .54$ ,  $p < .01$ . In addition, a significant proportion of students chose the bearded character when asked, "Who would you prefer teach you about the Civil War?",  $P = .74$ ,  $p < .01$ . Only 34 percent of students chose the bearded character when asked, "Who do you think is the friendliest?" Student's choice of the beardless character as more friendly also was significantly different from chance,  $P = .34$ ,  $p < .01$ .

Table 1 *Students' choices for a bearded character as a Civil War teacher and as being friendlier than a beardless character: Mean proportions by grade level and gender*

	Gender		Grade level				Totals
	Male	Female	5	6	7	8	
Civil War teacher	.80	.67	.68	.74	.80	.75	.74
Friendliness	.38	.30	.31	.29	.35	.41	.34
Totals	.59	.48	.49	.52	.57	.58	.54

When asked to select which character was more friendly, both males (62 percent) and females (70 percent) chose the beardless character more frequently than the bearded character. All grade levels also more frequently chose the beardless character as being more friendly. Choice proportions for the beardless character ranged from 70 percent of sixth-graders to 59 percent of eighth-graders.

Within the context of selecting a Civil War teacher, both males (80 percent) and females (67 percent) chose the bearded character more frequently than the beardless character. All grade levels also preferred the bearded character more often than the beardless character as a Civil War teacher; proportions ranged from 68 percent of fifth-graders to 79 percent of seventh-graders. All grade-level and gender groups' mean preference proportions for both questions were significantly different from chance.

No significant differences were obtained for the grade level main effect. However, significant differences were found within gender on both questions. On the Civil War teacher question, males more frequently preferred the bearded character,  $F(1, 636) = 13.11, p < .01$ . Males also more frequently chose the bearded character as being friendly,  $F(1, 635) = 4.12, p < .05$ . No significant interactions were found.

Based on a paired-samples  $t$ -test, question context was found to have a significant effect on students' choices of the bearded character,  $t = -15.76, p < .01$ . Students more frequently chose the bearded character as a Civil War teacher than they chose that character as being the more friendly character.

## Discussion

Interpreted simply, students prefer a bearded character over a beardless character when considering who they want to teach them about the Civil War (74 percent choosing the bearded character). However, when considering who is more friendly, students more frequently choose the beardless character (66 percent choosing the beardless character). Each of those preferences was fairly strong. An examination of the effect of context on children's choices of characters is helpful for interpreting what those results mean for instructional design.

### Context Differences

The proportions of students choosing the bearded character were significantly different for the two different survey questions. "Who do you think is the friendliest?" asked for a more general indication of preference, an indication of which character was perceived as more affable, more likeable, more preferable. Most students chose the beardless character as being more friendly.

The question also aimed to explore the personality traits that students might associate with beards. The researchers hypothesized that there might be two bearded-men stereotypes on opposite ends of the friendliness spectrum. First, there's the Santa archetype: jolly, generous, and friendly. Then there's the mountain man stereotype: gruff, grizzly, and much less friendly. A beard likely carries connotations, the researchers just weren't sure what those connotations would be for this study's adolescent students, they weren't sure what stereotypes those participants held about bearded men. In contrast, the beardless character was relatively stereotype-free, meant to represent an "average guy."

The results do not permit a definitive statement that students perceived the bearded character as unfriendly, but the results do permit it to be said that friendliness was a personality trait that students associated the trait of friendliness less strongly with the bearded character than with the beardless character. Because facial

hair was the only attribute that varied between the two characters, the results seem to indicate that beards, in isolation from all other attributes of animated characters, do not strongly transmit an air of friendliness. That finding appears to complement Tobin's (2000) findings that children named less-than-perfect grooming as a sign that a character is a bad guy.

Where the friendliness question was context-neutral, the question "Who would you prefer teach you about the Civil War?" associated the character with a rich context, and the question elicited very different results: given that scenario, most students preferred the bearded character. Many approaches to design suggest placing students in authentic or simulated contexts (Choi & Hannafin, 1995; Cognition and Technology Group, 1992). In addition, some researchers and developers of animated agents suggest that agent characters look their parts, that they represent their role in the software (Laurel, 1997). A bearded character might have appeared more authentically Civil War era; students might have seen pictures of Civil War figures or movies about the Civil War and noted that many of the men in that time wore beards. A bearded character also might have better represented the Civil War context; beards typically are associated with older men and the Civil War is a historical (i.e., old) context.

If in fact students chose the bearded character because of his authenticity or because of what he might have represented, the results provide evidence that aspects of authenticity and representation are important to students. Given the context of learning about the Civil War, having an authentic-looking animated instructor (i.e., a bearded Sarge) appeared to be more important to this study's participants than having a friendly-looking animated instructor (i.e., a beardless Sarge).

## **Gender**

For both questions, boys more frequently preferred the bearded character than girls. Previous studies have shown students to prefer characters of the same gender that they are (Barrett & Sullivan, 2004; Beyard-Tyler & Sullivan, 1980). In this study, female students did not have the choice of a female character. However, it might be argued that a beard makes a male character even more masculine. If that is the case, then female students more frequently preferred the less masculine character than male students, and male students more frequently preferred the more masculine character. That hypothesis suggests that prior studies of preference for character gender were too simplistic; preference might need to be studied for characters that fall on various points of a continuum of masculinity and femininity.

An alternate explanation might simply be that a beard represents a certain ruggedness, toughness, or masculine maturity. Those traits certainly would have been more appealing to male participants than female participants.

## **Implications for Design**

Studies of gender preferences (Barrett & Sullivan, 2004; Beyard-Tyler & Sullivan, 1980) make this rule clear: When designing instruction for females use female characters; when designing instruction for males use male characters. However, instruction for users of only one gender is rare. This study suggests that characters might be perceived as falling on a gender continuum. Therefore, to appeal to users of both genders using characters who are extraordinarily girly girls or manly men likely should be avoided.

That context and character-authenticity appear to be important to students makes the designer's job both easier and tougher. When designing educational software in which an animated character will be used, the designer simply might need to consider the content and learning environment then create a character that fits both. Nevertheless, designers need to be aware that children might not share the same set of concepts and character archetypes that most adults of a culture might share (Applebee, 1978; McKown & Weinstein, 2003). In addition, the designer must be wary of reusing characters; contexts will vary from instructional program to instructional program. However, because developing animated characters for software is an expensive enterprise, designers might need to reuse characters. When this is the case, designing a character that fits only certain contexts should be avoided.

As suggested by this study, authenticity and desirability might not always work together; an authentic Civil War character might not be perceived as the friendliest of characters. If the designer is especially dedicated to meeting the needs of learners, experimentation must be done to find the right combination of character attributes to convey *both* authenticity and desirability.

## **Resources**

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