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AUTHOR Rezabek, Landra L.
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ABSTRACT

This study examined the effects of gender, attitudes toward computers, and presentation of individual or paired female peer talent on adolescent learners' perceptions of talent credibility in the context of media presentations on computer utilization. Subjects were 96 eighth grade students (56 females, 40 males) enrolled in careers and communications classes in an Oklahoma City area school. Students completed Part 1 of the Minnesota Computer Literacy and Awareness Assessment to determine their extant attitudes towards computers, and were assigned to four treatment groups to give balanced representation of sex and positive or negative attitudes toward computers. Four slide-tape presentations on computer utilization were prepared using one or two adolescent females to deliver the introduction. Talents A and B appeared alone on each of two tapes, and were paired on the other two, each serving as the main focus on one of the tapes. The data showed no significant differences in credibility scores based on gender or attitudes toward computers. However, there was a consistent trend for students to assign higher credibility scores to individuals rather than paired talents, regardless of the subject's gender or attitude toward computers. The most frequently cited reason for perceiving talent as credible was the fact that the talent had been chosen to appear in the media presentation. When questioned about preferences for using computers alone or with a friend, female students more frequently gave a preference for working with a friend. However, preference for working with a friend did not differ in males or females based on attitudes toward computers. (34 references) (EW)

PERCEIVED CREDIBILITY OF FEMALE PEER TALENT IN THE CONTEXT OF COMPUTER INSTRUCTION

Landra L. Rezabek
University of Wyoming
College of Education, Box 3374
Laramie, WY 82071
(307)766-3608

PERCEIVED CREDIBILITY OF FEMALE PEER TALENT

IN THE CONTEXT OF COMPUTER INSTRUCTION

Introduction and Rationale

The credibility of persons who deliver instructional messages is a key factor influencing the effectiveness of media presentations utilized in educational settings (Fleming & Levie, 1978). Research in the field of communications indicates that a receiver's perception of the speaker's credibility is almost always related in some way to the impact and effectiveness of the message (Andersen & Clevenger, 1963). Thus, those designing and utilizing visual presentations must concern themselves not only with the content of the instructional message but with the credibility of the talent who appears in the visuals.

Talent credibility, however, is known to be affected by a number of variables. These variables include characteristics of the talent, characteristics of the audience, and the influence of the particular topic itself. Since an instructional message is a "pattern of signs (words and pictures) produced for the purpose of modifying the cognitive, affective, or psychomotor behavior of one or more persons" (Fleming & Levie, 1978, p. ix), talent chosen to appear in media productions should be most effective in their ability to influence learners to think, feel, or behave in accordance with specified learning outcomes.

Social learning theory (Bandura, 1969, 1977, 1986; Bandura & Walters, 1963) suggests that visuals can play a role in influencing human behavior as part of a continuous interactive process involving cognition, behavior, and environmental factors. Observational learning is a key component involved in the social learning process and is defined as the "tendency for a person to reproduce the actions, attitudes, or emotional responses exhibited by real-life or symbolized models" (Bandura & Walters, 1963, p. 89). Learning is considered to occur through the observation of symbolized models, such as those appearing in visual presentations, and social learning theory emphasizes the importance of utilizing models who will be viewed as credible by the intended audience. Bandura (1969, 1977, 1986) further indicates that learner characteristics will influence the efficacy of any given model for any given group of observers. Additionally, Bandura suggests that the context in which the models appear will influence observational learning. Thus, a particular model's credibility may vary, depending on characteristics of the model, the audience, and the topic.

Selecting credible talent to appear in instructional media productions on the topic of computers and computer utilization is a challenge for persons interested in designing, producing, and utilizing media presentations for adolescent learners. Numerous articles in the popular press (Elmer-DeWitt, 1986; Horn, 1985; Sealfon, 1986) as well as entire special issues of professional journals (Lockheed, 1985a; Moursund, 1984) have noted an emerging gender gap in computer utilization between female and male learners which becomes most apparent around the time of adolescence. The gender gap is manifested in areas such as enrollments in computer literacy and programming classes, attendance at computer camps, home use of computers, elective time spent in computer activities, and level of elective computer instruction attained. The concern exists that secondary school students are perceiving computer use as a primarily male domain

and that capable females are self-selecting out of computer courses and computer related activities. The sex-typing of computer use as an activity inappropriate for adolescent females is believed to reduce females' potential for achievement in computer-related studies and associated careers (Jones, 1983; Moursund, 1984).

A proposed educational intervention to encourage adolescent females to participate in computer activities is to present computer-using female models in both live and mediated observational learning situations. Research on the impact of gender characteristics of instructional materials (Schau & Scott, 1984; Scott and Schau, 1985) indicates that instructional media can either restrict or broaden pupils' attitudes about who can or should participate in activities which are represented in media presentations. Investigation of ways in which instructional media productions can be designed to encourage young females as well as young males to learn about and utilize computers is justified. The selection of credible talent chosen to appear in such instructional media presentations is an integral part of this endeavor.

In selecting credible talent to serve as models for observational learning in the context of computer instruction, characteristics of the talent, characteristics of the learners, and the influence of the topic itself again emerge as primary considerations. Factors relating to the characteristics of the learners and to the characteristics of the talent which may affect the credibility of the talent include the age and gender of both the observer and the model. Peers are known to be effective role models in certain circumstances (Cantor, Alfonso, & Zillmann, 1976; Conger, 1973; Kimmel & Weiner, 1985; Lueptow, 1984; Schunk, 1987; Weitzman, 1979). Learners may find talent of the same gender as their own to be most credible (Pearson, 1982a, 1982b; Schau & Tittle, 1985; Schunk, 1987). By observing peer models, adolescents learn about and often adopt attitudes and behaviors which they feel are appropriate for their gender as well as for their age (Kimmel & Weiner, 1985; Lueptow, 1984; Schunk, 1987). However, the tendency to sex-type computers and computing as an activity more appropriate for males than for females (Campbell, 1984; Elmer-DeWitt, 1986; Lockheed, 1985b; Sanders, 1985; Sanders & Stone, 1986; Schubert, 1984) conceivably affects the perceived credibility of female peer models appearing in instructional presentations on computer use.

Female talent might not be perceived as credible, solely on the basis of gender, when presenting information pertaining to the traditionally male domain of computers and computer use. Because adolescent females are considered to be the learners at risk in terms of computer instruction, and because the credibility of female talent for both female and male learners is unknown in this context, the present study specifically investigated the credibility of adolescent female talent within the context of computer instruction. Both female and male adolescents observed computer-using female models, and the gender of the learner served as an independent variable in the present study.

Another gender-related social message about computers which learners may receive is that computing is a solitary activity and therefore more appropriate for males. Lueptow (1984) suggests that traditional sex role stereotypes associate the female sex role with the characteristics of expressiveness, affective concern, relationship-orientation, nurturance, communion, and cooperation. The male sex role is traditionally associated with characteristics such as independence, self-sufficiency, task-relevant orientation, autonomy, self-reliance, and individualism. As Lueptow and others are quick to note, these

qualities associated with female and male sex roles are generalizations and are neither good nor bad, but emerge as characteristics with which female and male sex roles traditionally have been associated.

These patterns of adolescent sex role development indicate that females are encouraged to form social relationships and to focus on interpersonal activities, which conflicts with the ways in which computer utilization often is portrayed and taught. Studies conducted by equity organizations indicate that adolescent "girls generally prefer people to things and enjoy working in groups more than pursuing solitary activities. Friendships and social interactions are important at this age but are rarely encouraged in computer work" (Sealfon, 1986, p. 54). The presence of other female friends and the ability to work in pairs at a single machine are strong inducements for female adolescents' participation in computing activities, with the implication for educators being "to encourage groups of girls -- friendship groups -- rather than individual girls to use the computer" (Sanders, 1985, p. 26). It is conceivable that portraying female computer-using talent in pairs rather than as individuals may indicate to female learners that computer use is an activity in line with the traditionally female concerns for friendships and cooperation. Schunk (1987) also notes that multiple models may increase the effectiveness of observational learning situations. Such paired portrayals may affect the credibility of the talent appearing in instructional presentations. Individual or paired female talent was a second independent variable in the present study.

Another potential influence on perceived credibility of the talent is a learner's attitude toward the topic of instruction. Bloom's (1976) theory of school learning suggests that attitudes toward a topic which students bring with them to the instructional setting will influence both cognitive and affective learning outcomes. Reece and Owen (1985) corroborate Bloom's research within the context of computer instruction. Learners' existing attitudes toward computers may influence their perceptions of the credibility of the talent appearing in instructional media presentations on computer utilization. Learners' attitude toward computers served as an independent variable during the study.

This study examined adolescent learners' perceptions of talent credibility in the context of media presentations on computer utilization. Specifically, the study investigated the effects of 1) learners' gender, 2) learners' attitudes toward computers, and 3) presentation of individual or paired female peer talent on eighth grade learners' ratings of perceived talent credibility. The study sought answers to the following questions:

1. Is perceived talent credibility affected by learners' gender?
2. Is perceived talent credibility affected by learners' attitude toward computers?
3. Is perceived talent credibility affected by the number of female talent appearing in each visual?
4. Is perceived talent credibility affected by interactions between or among learners' gender, learners' attitudes toward computers, and number of talent?

Method

Subjects

Subjects for this study were 96 eighth grade student volunteers (56 females, 40 males) enrolled in careers and communications classes at a middle school (7th - 8th grade) located in the metropolitan Oklahoma City area. Seventy percent of all students enrolled in the school take the careers and communications classes. Subjects ranged in age from 13 to 15 years, with the majority of the participants being 14 years old. Ethnic distribution of students in the school was 95% Caucasian with the remaining 5% of students representing Mexican-American, Black, Vietnamese, and American Indian students. Students in this particular school district had been briefly introduced to computers at the elementary school level, but the middle school had no formal computer education program. Some students had access to microcomputers in the school media center, homes, or parents' place of employment.

Materials

Part I of the Minnesota Computer Literacy and Awareness Assessment, Form 8, (Anderson, Klassen, Krohn, & Smith-Cunnien, 1982), hereafter referred to as the MECC assessment, was used to determine learners' extant attitudes toward computers at the beginning of the study for purposes of randomly assigning students to treatment groups. An alpha reliability of .85 was obtained using the instrument in the present study, which adds credence to its status as an appropriate instrument to use in similar situations.

Perceived talent credibility was quantified using a scale adapted from the McCroskey Scales for the Measurement of Ethos (1966), with content and face validity of the adapted instrument verified by experts in the field of communications. As with the original instrument, talent credibility scores were composed of two subscales: 1) authoritativeness (competence) and 2) character (trustworthiness). The internal consistency for the first and second administrations of this scale during the current study were .95 and .96 respectively. Cronbach alpha reliabilities for the authoritativeness subscale were .94 and .95 for the first and second administrations of the instrument, while alpha reliabilities for the character subscale were .92 and .95 respectively. These results indicate that this instrument may prove useful in future research to measure the perceived credibility of talent delivering instructional messages about computers.

Students also answered open-ended questions about their perceptions of the overall credibility (authoritativeness and character) of the talent. At the conclusion of the treatment sessions, students responded to open-ended questionnaires asking them to describe classroom situations in which they would most like to learn about using computers.

Four short slide-tape shows were produced by the researcher which depicted individual or paired female talent delivering the introduction to a media presentation on computer utilization. Talent were selected who were similar to the majority of subjects in age and ethnic background. The two 14 year-old females selected as talent dressed similarly and were photographed working as individuals and also working in pairs in a computer classroom. Care was taken to duplicate the positioning, expression, and overall content of each scene as the

talent were changed. An adolescent female with an articulate, pleasant voice served as the narrator. The same taped version of the narration was used in each of the treatment conditions.

To control for variables other than individual or paired presentation which might contribute to the perceived credibility of the talent, counterbalanced treatment materials were prepared. To help control for differences in physical appearance of the two talent, Talent A appeared as the individual talent in one treatment and Talent B appeared as the individual talent in another treatment. The two females also appeared together in versions of the paired talent treatment. One paired version portrayed Talent A as the main or central focus of the photograph, with Talent B also appearing in the slide (Talent A/Talent B). The other version portrayed Talent B as the central figure, with Talent A appearing as the second adolescent involved (Talent B/Talent A). Controlling for order effects dictated four treatment groups in which students viewed either individual or paired presentations in differing order: 1) Talent A first, Talent B second, 2) Talent B first, Talent A second, 3) Talent A/Talent B first, Talent B/Talent A second, and 4) Talent B/Talent A first, Talent A/Talent B second. Though four treatment groups were utilized, results from the appropriate groups were combined to yield individual treatment data and paired treatment data.

Procedure

The MECC attitudinal assessment was administered to 96 initial participants in their respective classrooms during four consecutive class periods. Taped directions were played by a female adult proctor and the regular male teachers were present in each classroom during the administration of the instrument. As was the case with all test materials, students' names and additional information had been coded onto answer sheets prior to their distribution. For both the MECC assessment and the Perceived Talent Credibility scales, students marked their responses to Likert-type questions directly on computer answer sheets. Responses were optically scanned and scored, and 10% of the response sheets were hand checked and found to be accurately processed by the computer.

Statistically significant differences were found in the scores between female learners ($\underline{M}$ = 71.50) and male learners ($\underline{M}$ = 76.33) on the MECC assessment, $\underline{t}(72.70) = 2.09$, $\underline{p}<.05$, two-tailed. For this reason, female subjects were categorized as having positive attitudes toward computers if their scores were above 72 and negative attitudes toward computers if their scores were 72 or below. Similarly, male subjects whose scores were 76 and above were considered to have positive attitudes toward computers while male subjects with scores falling below 76 were categorized as having negative attitudes toward computers. After female and male participants had been categorized as having positive or negative attitudes toward computers, stratified random assignment by gender and attitude toward computers was used to assign students to one of four treatment groups.

Three days later, 91 students present to participate in the remainder of the study were directed to one of four classrooms where they viewed the appropriate versions of the slide-tape presentations and completed the Perceived Talent Credibility scale during their regular 55-minute class periods. Tape recorded instructions to the students were administered by adult male teachers who directed the data collection procedures in each classroom. Students in each treatment group viewed a slide-tape presentation and then answered both the

multiple choice and open-ended questions regarding perceived talent credibility. Student responses to the first presentation were collected, and each group of students then viewed the second slide-tape production. Students again answered the questions regarding the perceived credibility of the talent and an open-ended question on their preferences for classroom situations in which they would most enjoy learning about computers.

Results

Main and Interaction Effects

A three-way factorial analysis of variance (ANOVA) was used to determine whether the dependent measure, perceived talent credibility scores, was affected by learners' gender (female or male), learners' attitude toward computers (positive or negative), number of talent (individual or paired), or interactions between or among these independent variables. With alpha set at .05 and power set at .80, a medium-large effect size of approximately .30 would have been detected with the sample size of 91 subjects. No significant main or interaction effects were detected at these levels. The main effect for learners' attitude approached significance ($p=.057$). There was a consistent trend for students to assign slightly higher credibility scores to individual rather than paired talent, regardless of the subjects' gender or attitude toward computers. The combined effects of learners' gender, learners' attitude toward computers, and presentation of individual or paired talent accounted for 8.5% of the total variance in perceived talent credibility scores.

In analyzing the subscale for authority of the talent, main and interaction effects were not significant. The combined effects of learners' gender, learners' attitude toward computers, and presentation of individual or paired talent accounted for 7.4% of the variance in scores for the subscale measuring talent authoritativeness.

In analyzing the subscale for character of the talent, the mean score for subjects with positive attitudes toward computers was 130.48, and the mean score for students with negative attitudes toward computers was 123.32. The ANOVA indicated a significant main effect for learners' attitude, $F(1, 83) = 3.98$, $p<.05$. Other main and interaction effects were not significant. The combined effects of learners' gender, learners' attitude toward computers, and presentation of individual or paired talent accounted for 11.8% of the variance in scores for the subscale measuring talent character.

Open-ended Responses

In responses to open-ended questions, the most frequent reason students cited for perceiving the talent as credible was the fact that the talent had been chosen to appear in a media presentation. Because talent had been selected to appear in an instructional production, subjects believed them to be both competent and trustworthy sources of information about computers. The most frequent reason cited for not perceiving the talent as credible was lack of substantial, in-depth computer related content in the slide-tape program.

When asked whether they would rather work with a computer alone or with a friend, chi square calculations revealed a statistically significant difference between the responses of females and males. Females expressed more frequent

preferences for using computers with a friend than did males: $\chi^2(1, N = 88) = 3.84$, $p<.05$. Females with positive or negative attitudes toward computers did not differ significantly from each other in their preferences for working on computers alone or in pairs. Seventy-three percent of all females indicated a preference for working on computers in pairs, regardless of their attitude toward computers. Males with positive attitudes did not differ significantly from males with negative attitudes, with fifty-three percent of all males indicating a preference for working on computers in pairs, regardless of their attitudes toward computers. No significant relationship was found between gender of students with positive attitudes toward computers and their stated preferences. Chi square calculations revealed a significant relationship between gender of students with negative attitudes toward computers and their preferences for using computers, with females preferring to work with a friend: $\chi^2(1, N = 42) = 7.74$, $p<.01$.

Discussion

Main and Interaction Effects

Several considerations are raised by the failure of the three-way ANOVA to detect significant main or interaction effects upon perceived talent credibility scores. Data indicate that the gender of the learner did not affect the perceived credibility ratings of female peer talent appearing within the context of computer instruction. Data collected in the open-ended questionnaires indicate that the fact that a particular talent had been chosen to appear in an instructional presentation contributed to the credibility of the talent. Apparently, learners of both genders were willing to believe that female talent who appeared in media presentations were both competent and trustworthy or they would not have been selected to serve as talent. Results of this study support the proposition that, in light of recent calls for computer-using female role models, female peer talent may be used in instructional presentations without jeopardizing the talents' credibility for female or male learners.

The main effect for differences in perceived credibility scores for learners with positive or negative attitudes toward computers approached significance. Statistically significant differences in scores on the character (trustworthiness) subscale were found for learners with positive or negative attitudes toward computers. These results suggest that attitude toward a topic influences the credibility of a talent delivering instructional messages. Subjects with positive attitudes toward computers rated talent higher in credibility than did students with negative attitudes toward computers. Bloom (1976) stresses the importance of initial attitude toward a subject or task as a major factor influencing both cognitive and affective learning outcomes, and it appears that initial positive attitudes towards a subject may increase the credibility of the talent delivering information on that topic as well. Specifically, it appears that learners with positive attitudes toward computers perceive talent as more trustworthy than do learners with negative attitudes toward computers.

No main effect for individual or paired talent presentation was found, though a consistent trend indicated that learners, regardless of gender or attitude toward computers, rated individual talent slightly higher in perceived credibility than paired talent. One possible explanation is that individual

talent versions suggested to the audience that the talent was an expert while paired talent versions suggested a subtle lack of expertise on the part of each individual. Since students viewing the paired treatment versions had less variety in the visual presentations than those subjects who viewed individual versions, boredom was considered a potential reason for slightly lower credibility scores. However, credibility scores of individual talent were slightly higher than paired talent scores on the first administration of the instrument as well as on the second, discounting this possibility. Results of this study indicate that the presence of individual or paired female peer talent made virtually no difference in perceived credibility scores for eighth grade learners.

No interaction effects were found to exist. However, the median split procedure used to assign learners to groups of students with positive and negative attitudes toward computers may have obscured results which might have been found using extreme group comparisons. The current study was conducted utilizing the median split procedure as it was thought to be a more true reflection of conditions existing in actual classroom learning situations. Again, options for future research exist. Additionally, the combined effects of learners' gender, learners' attitudes toward computers, and presentation of individual or paired female talent accounted for only 8.5% of the total variance in perceived talent credibility scores. This finding indicates that other factors not investigated in this study contribute to the perceived credibility of talent appearing in instructional media presentations and suggests an avenue for further research.

Open-ended Responses

Of the subjects who did not believe the talent was credible, the majority cited the failure of the talent to provide them with substantial computer-related information as the reason for low talent credibility. Of the subjects who found the talent to be credible, the majority stated that they did so because they had learned something about computers from the presentation. Research (Andersen & Clevenger, 1963; Bowers & Phillips, 1967; Brock, 1965) indicates that the inclusion of specific content into the treatment presentations may introduce extraneous variables into the ratings of perceived talent credibility, therefore the slide-tape treatments had been designed to be as free from specific computer-related content as possible. Data from the open-ended questionnaires support the contention that the informational content of an instructional message will influence the perceived credibility of the talent and that viewers may judge the credibility of the talent by comparing what the talent says to the learner's personal expertise.

Viewing individual or paired talent presentations had no relationship to students' stated preferences for working with computers alone or with a friend as indicated in open-ended responses. However, responses to the questions did suggest that students' gender and attitude toward computers were related to their preferences for working alone or in pairs. Female students, in comparison to male students, were found to express a statistically significant preference for working on a computer with a friend. This relationship appeared to be most influenced by female learners with negative attitudes toward computers. Females with negative attitudes, in contrast to males with negative attitudes, expressed a significant preference for learning about computers with a friend. Gender was not related to preferences of students with positive attitudes. These findings

lend support to the idea of teamwork as a proposed educational intervention for encouraging females to participate in computer learning activities (Sanders, 1985; Sanders and Stone, 1986) and suggest that working in pairs may be an especially attractive option for females with negative attitudes toward computers. Further research in this area is warranted. Additional research is also needed to determine more specific effects of talent credibility upon cognitive and affective learning outcomes when computers are the subject of instruction.

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