The Effects of Garment Color upon Audience's Perception of Source Credibility

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THE EFFECTS OF GARMENT COLOR UPON AUDIENCE'S PERCEPTION OF SOURCE CREDIBILITY

BY

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TO MOM AND DAD
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INTRODUCTION AND RATIONALE

Andersen and Clevenger (1963) define the concept of credibility as "the image held of a communicator at a given time by a receiver - either one person or a group" (p. 177). Their review of research covers a number of studies which are concerned with the concept of credibility and its effects upon social and political issues, evaluations of art and literature, and learning. In addition to discussing the effects of credibility upon the above phenomena, the authors mention the fact that studies dealing with source credibility are diverse and arise from many professional fields.

Andersen and Clevenger summarize a number of studies on credibility and discuss many of the factors which are often involved in research on the concept. These factors fall into several categories, including those directly related to the source, those related to internal elements of the message, factors involved with the presentation, and factors which pertain to the audience. Factors which directly pertain to the source include prestige, popularity, degrees of self-interest and motivation, as well as identification with a cause. Designs in which these factors are manipulated generally utilize a
standardized message. The independent variable is the manner in which the speaker is introduced. In other studies, internal elements of the message are varied. These factors include the use of authority quotations, inclusion of expert or majority opinion, speech composition, and the central proposition contained in the message. In addition, the use of opposing arguments, citing of a source, and the use of evidence are factors which have been considered within the message.

Nonverbal factors involved with the presentation include style of delivery, length of message and introduction, method of delivery, and the speaker's appearance. Audience-related factors include size of the audience, sex, intelligence, age, the urban-rural dimension, and the initial opinion held by the audience on the topic.

Authoritativeness, character, dynamism, and to a lesser degree, liking and attraction are the dimensions which are employed within most experimental paradigms designed to evaluate the credibility of a given source. McCroskey (1966) determined that authoritativeness and character are the most important dimensions in determining the credibility of a source. Authoritativeness, also known as competence and qualification, refers to a source's expertise on a particular topic. The character dimension, often called trustworthiness or safety, refers to a source's warmth, friendliness, and honesty.
McCroskey (1966) used a semantic differential as the dependent measure to determine the subjects' attitudes toward the source of a communication. This semantic differential consists of twelve sets of bi-polar adjectives. Six items pertain to the dimension of trustworthiness, while the remaining six items constitute the character dimension. McCroskey contends that the dimension of authoritativeness consists of degrees of reliability, informity, qualification, intelligence, value, and expertise. The character dimension, according to McCroskey, consists of degrees of honesty, friendliness, pleasantness, unselfishness, niceness, and virtuosity.

Berlo, Lamert, and Mertz (1969) also conducted factor analyses in an effort to determine the dimensions of source credibility. They concluded that safety, qualification, and dynamism are most important in determining credibility. As mentioned previously, safety and qualification are roughly synonomous with trustworthiness and authoritativeness. The dynamism factor acts as an intensifier. If a source is perceived as being highly qualified and safe, a high rating on dynamism will intensify the other dimensions in a favorable manner. Conversely, if the source is perceived to be low on the dimensions of qualification and safety, a high rating on the dimension of dynamism will negatively intensity this low rating.
The results of many studies indicate that a positive relationship exists between source credibility and persuasion.

Haiman (1949) tested the effect of manipulated source credibility on immediate attitude change. A tape-recorded speech on socialized medicine was presented to three equivalent groups of subjects. In one condition, the subjects were told that the person delivering the message was Thomas Parran, Surgeon General of the United States. In a second condition, the source was identified as Eugene Dennis, Secretary of the Communist Party in America. A third group of subjects was told that the source of the message was a student at Northwestern University. The message which was attributed to Parran, the high credibility source, was more effective in changing attitudes toward the topic than were the two messages which were reported to have been delivered by the lower credibility sources.

In a classic study by Hovland and Weiss (1951), the credibility of the source was manipulated in order to determine its effect on the retention of the message, recall of author, and opinion toward the issue. Hovland and Weiss presented the same written communications to various groups while varying the credibility of the source. Opinions on the topics were measured before the communication by use of questionnaires.
The effects of source on factual information and on opinion were measured immediately after, and four weeks after the communication. No differences were found in the amount of factual information learned or retained over a four week period due to manipulation of source credibility. However, greater opinion change occurred immediately after the communication when the topic was presented by a trustworthy source than when presented by a source considered to be untrustworthy.

Results of a study conducted by Kraus (1960) showed a relationship between credibility and persuasive ability with film used as the stimulus medium. The study was designed to test the relative effectiveness of Negro and Caucasian actors, appearing in films, in changing the attitudes of Caucasian high school students toward Negros. A script was written for two characters. Four kinescopes were made. The independent variable in the kinescopes was the performers who appeared.

The first condition used two Caucasian performers; condition two, two Negro performers; condition three, one of the Caucasian performers seen in condition one and one of the Negro performers seen in condition two; condition four, same as condition three with the roles reversed.

Students from eight Iowa high schools were assigned in
pairs to the four treatments. Students from a ninth school served in a control condition and saw no film. Pre-tests were taken to determine initial attitudes. Five weeks after pre-testing, the eight groups were post-tested immediately after seeing the films.

Results indicated that the credibility of the performers was determined to be greater when they appeared to be practicing what they preached. Conditions three and four were significantly more effective in changing attitudes than were the other conditions. Perceived sincerity increased the performers' credibility. High credibility, in turn, increased the performers' ability to persuade the subjects to change their attitudes.

Credibility is considered by most researchers to be a dynamic, constantly changing concept rather than one which remains static and rigid. Steinfatt (1977) speaks of three stages of credibility which occur during a communication event. Initial credibility is the perceived credibility of a communicator at the beginning of the communication process. Interactional credibility refers to the source's credibility at any time during the communication process. Credibility at the end of the communication is referred to by Steinfatt as terminal credibility.
While many studies are based on the assumption that credibility is fixed throughout the communication, many others are based on the congruity principle as stated by Osgood (1955). Andersen and Clevenger (1963) state, "the congruity principle holds that an image or meaning depends upon the other concepts with which it is associated and thus is subject to perpetual change. Among the factors causing these variations are the successive parts of the message" (p. 188).

Andersen and Clevenger (1963) note that credibility seems to have a temporal quality. A message presented by a highly credible source loses persuasiveness and one presented by a source low in credibility gains persuasiveness with the passage of time. Hovland (1951) referred to this temporal phenomenon as the "sleeper effect". The sleeper effect refers to the increase of agreement with a low credibility source and the decrease of agreement with a high credibility source over a period of time. The reason for this phenomenon, according to Hovland, is that the subject forgets the source but retains the information.

Andersen and Clevenger (1963) identify other factors which affect credibility: propaganda, speeches of introduction, certain characteristics of speech, and stimuli such as dress, voice, and manner.
In the much studied area of source credibility, Snyder and Rothbart (1971) found that the physical attractiveness of a communicator contributes to the effectiveness of his or her message. A tape-recorded persuasive message was presented to male and female subjects while a slide of a man identified as the speaker was projected onto a screen. This process was used with two groups of subjects. The first group was shown a slide of a speaker considered to be unattractive. A second group was shown a slide of a speaker considered to be attractive in appearance. A third group listened to the communication but saw no slide of the communicator. Each of these three groups completed a questionnaire regarding their feelings about the speaker. A fourth and fifth group did not listen to the message but looked at a slide of the attractive speaker and the unattractive speaker respectively while completing the questionnaire. The attractive speaker was judged to be more persuasive than both the unattractive speaker and speakers not pictured.

Personal appearance of an individual is a composite of a number of elements: physical features, attitude, and posture. There are other elements, some obvious and some not so obvious, which add to or subtract from the total image of an individual. One very obvious aspect of an individual's appearance is his or her dress.
We all know the importance of donning the "proper" attire for any given social occasion. The importance of this idea has been stressed by many so-called fashion experts. We received advice on this subject as children from our parents as they dressed us in the proper attire for school, or play, or any number of special occasions. In the many fashion magazines and the books written about the subject of personal appearance, we are constantly advised regarding what to wear for every conceivable occasion. We are warned to dress tastefully or to dress for success. The fashion experts express their personal theories on the subject repeatedly. However, there seems to be little scientific evidence regarding the importance of this subject. Furthermore, while there exists only little scientific evidence pertaining to the area of speaker's attire in general, there seems to be an even more obvious lack of empirical information regarding the effects of color in a speaker's garment on the perception of the speaker's credibility. This study attempts to explore that specific area.

The dress of a speaker can lend much to his or her overall perceived attractiveness. Jones (1969) established the importance of fashion as an element in the appraisal of unknown persons. Persons in this study wearing clothing considered to be in fashion were held in higher regard than those wearing out of fashion apparel. A relationship between stereotype
personalities and style of clothing was confirmed by Hamid (1968).
Color magazine photographs of female figures were selected for
stimuli in this study. The figures were similar in physical
appearance, facial expression, and hair color. The clothing
and accessories in the photographs were systematically varied
to cover a wide range of female dress. The photographs were
rated on ten concepts. Concepts such as intelligent, religious,
conventional, and unimaginative were attributed more frequently
by both male and female judges for figures with glasses. Figures
with make-up, brightly colored dresses, and short hemlines were
given high ratings by both sexes for such concepts as sophisticated,
immoral, and physically attractive. These later ratings were
particularly high for male judges. Hamid concludes, "Results such
as these demonstrate also the influence of dress on the type of
impression formed and it is quite possible that, particularly in
the perception of the opposite sex, dress will have a decided
influence on the resulting impression" (p. 905).

Heaton (1974), in a study entitled The Influence of
Prestigious Women on Middle-Class Women's Attitudes, observed:
"Although clothing has been recognized as a symbol for conveying
information about the personality of the wearer, the influence
of dress on the type of impression formed is little under-
stood" (p. 38).
In the popular literature relating to dress, John Molloy (1975, 1977) is the only writer who claims to use scientific research in establishing his rules. Molloy stresses the importance of association in his two books. *Webster's Third New International Dictionary* (1976) defines association as "the mental connection or bond existing between any sensations, perceptions, ideas, or feelings that to a subject or observer have a relational significance with one another" (p. 133).

Association undoubtedly plays a part in our lives. Molloy contends, for instance, that successful businessmen wear gray, navy, and beige suits. Therefore, if one wishes to be identified as a successful businessman, it would be helpful to dress in these colors.

Molloy was hired by several large companies to help establish theories of dress. He claims to have employed large teams of researchers and to have applied accepted modes of scientific research. However, there are problems with his work. Molloy mentions only a few studies with any detail. Since experiments done for these companies are not available to the scientific community, it is not possible to study his methodology. Furthermore, Molloy's work does not clearly distinguish the scientific from the subjective. In speaking of color, Molloy does not always clearly identify the colors in question. When he advises one to
wear red, for example, he does not clearly specify to which of the many varieties of red he is referring.

In one of the few studies Molloy describes, female subjects were shown three photographs of the same person. Molloy told his subjects to pick the one whom they thought was the most successful, the most influential, and the most wealthy. The only variable which differed in the photographs was the outfit worn by the person. Since he used no cover in this experiment, the independent variable may have been readily obvious to those participating. Molloy’s books are informative and interesting, but the value of the scientific information contained therein is questionable.

The research related to color is, of course, voluminous. The physiological, physical, and chemical aspects of color are not considered in detail within this study. This study concentrates on the psychological aspects of color and, in particular, the aesthetic aspects of the psychological category.

The ancients, according to Aristotle, believed that colors were made by combining black and white. The Greeks, of course, mixed colored pigments, but it was Newton (1730/1952) who first laid down the principles of the color spectrum. Much scientific information on color has been compiled since Newton’s research. The current study concentrates on recent research.
Aesthetic preference for colors produced by single relatively isolated objects has been studied extensively. Most of these studies used chromatic paper, a few inches in area, which had reflective samples of relatively high saturation producing red, orange, yellow, green, blue, and violet responses. Eysenck (1942) combined data from 26 investigations on single color preference. Twenty-one thousand and sixty subjects were used in these experiments. The favorite colors were ranked as follows: blue, red, green, violet, orange, and yellow. Analytical breakdown with respect to sex showed a .95 correlation between the preferential color orders of men and women. Staples (1932) conducted an experimental study in which colored disks were exposed to infants. The babies looked longer at bright colors than at pale colors. Their favorites, judged by reaching efforts and eye fixations, were red and yellow.

There have been studies regarding the psychological moods created by the various hues. Red, orange, and yellow, generally referred to as the warm colors, are known to repeatedly produce feelings of cheerfulness, warmth, and compassion. Red, in particular, produces excitement and aggression. It is associated, contrastingly, with both love and war in our Western world. Green, blue, and violet, the cool colors of the spectrum, in general, have a soothing effect on the perceiver.
Wexner (1954) presented eight colors and eleven mood concepts to 94 subjects. The results indicated that for some moods one particular color was significantly related; for others, two or more colors were associated with the concept. For example, red was picked a total of 61 times out of 94 as the color most often associated with the concept of exciting-stimulating. For the concept of protective-defending, red was chosen 21 times; brown 17 times; blue 15 times; black 15 times; and purple 14 times. Hull (1943) maintains that strong and persistent conditioned emotional responses to color are occasionally formed in certain subjects.

Light and energy affect not only the brain and the eye, but the body directly as well. Broadly, there are different biological reactions to the two extremes of the spectrum, red and blue. In humans, red tends to raise blood pressure, pulse rate, respiration, and skin response and to excite brain waves. Blue tends to have opposite effects, to lower blood pressure and pulse rate. Color brings about a reflex action upon the vascular system, if only through the feelings and emotions. However, the effect is not specific for any one hue. Warm colors may calm one person and excite another. Cool colors may likewise be stimulating to one person and passive to the next.

Deutsch (1937) placed subjects in a room colored with either
red or green artificial light. He concluded that the emotional changes which are recognized by changes in blood pressure, pulse-frequency, and rhythm are brought about through association. All colors can be psychologically therapeutic. However, different effects are achieved depending on the individual. Green may recall nature, mountains, or an evil movie monster. Red may recall the sunset, the fireplace, or a disastrous fire. The associations lead to deeper lying memories, which explain the affective emphasis of the attitudes toward the colors.

Goldstein (1942) found that the influence of color is greatly increased in neurotics and psychotics. One female subject who suffered from a cerebellar disease had a tendency to fall unexpectedly and to walk unsteadily. When she wore a red dress, such symptoms were more pronounced. While wearing green or blue, however, her equilibrium was restored almost to normal. Goldstein concluded that persons suffering from tremors and twitching may find such afflictions relieved if green glasses are worn; they filter out red rays and have a quieting effect.

Rubin and Katz (1946) documented the work of Cecil Stokes. Stokes was able to apply abstract color and sound films to the treatment of psychotic patients. He created and engineered Auroratone films and directed the Auroratone Foundation of America.
which established a number of sanctuaries of music and color in government hospitals throughout America. With the use of color and music most patients became more accessible. Patients with blocked speech spoke more freely. Those suffering from deep depression became absorbed with the music and color. One patient suffering from severe burns was described as restless, agitated, depressed, and frequently expressing a desire to die. After the treatment, his attitude was greatly changed and he cooperated with the psychiatrist, answering questions freely, and left the room in much higher spirits. The article did not state how long the effects lasted, however. The principles applied by Stokes are the same as those used three decades later in light festivals and discotheques to produce frantic excitement in the perceivers.

It has been shown that appearance affects one's persuasive ability. Mills and Aronson (1965) found that attitudes of male student subjects were modified more by an attractive female communicator than by a woman communicator judged to be unattractive. The experimenter suggested to the subjects that completion of several measuring instruments would be more expeditious if a volunteer would read and interpret the meaning of the questions. The volunteer was actually one woman who appeared in each of two conditions, attractive and unattractive.
In the unattractive condition, the woman appeared without make-up, her clothing was loose-fitting, her hair was disheveled, her complexion appeared to be oily and unwholesome, and a mustache was etched on her upper lip. In the attractive condition these elements were corrected. The attractive condition produced significantly greater attitudinal conformity in males than the unattractive condition.

Studies show that certain moods can be created in human subjects by manipulating environmental factors. In addition, these factors have been found to have an effect on human interaction. Environmental factors include phenomena such as: room size, decoration, illumination, odors, temperature, and color.

Empirical research involving the environmental factor of room appearance was conducted by Maslow and Mintz (1956). The independent factor in this study was the appearance of the room in which the treatment was administered. Three rooms were used for the study. A room designated as ugly was designed to give the impression of being a janitor's storeroom. The room was small and cramped, the furniture was disheveled, and the walls were painted battleship gray. Light sources for the room were two half-windows and an overhead bulb with a dirty, torn, and ill-fitting shade. This room was rated as horrible,
repulsive and ugly. The average room had the appearance of a professor's office. This room was the largest of the three rooms. It was equipped with ordinary office furniture, gray walls, three windows, and indirect lighting. The beautiful room was medium sized. It was illuminated by two large windows, and indirect lighting. This room had carpets and attractive furnishings. The room had the appearance of an attractive study. Subjects reported to one of the three rooms and were asked to rate negative print photographs of several faces. Results showed that subjects in the beautiful room rated the faces significantly higher on the aspects of energy and well-being than did those subjects in the average and ugly rooms.

Hospitals and business have used color to establish certain moods in patients and employees. In the sketchy area between communication and the fine arts known as the theater much careful attention and time are devoted to details in costume and stage design. Careful consideration is given to the manipulation of color in order to create the particular emotional response desired in the audience. A stage filled with large sets and numerous actors presents an opportunity to create a very stimulating visual response.

A speaker in a typical speech-audience situation, obviously, cannot duplicate the visual excitement that is created in a full-
scale theatrical production. The speaker must deal with the atmosphere which prevails in the particular speech location: office, classroom, auditorium, private home, etc.

Because of long-established customs, we all know that there are certain places and situations in which the use of particular colors would be in bad taste or, at least, risky. For instance, it is doubtful that a minister would speak at a funeral dressed in a suit of high-intensity yellow. One can imagine the immediate reaction. Likewise, most people probably would feel uncomfortable with a stockbroker who wore an ensemble of vivid red on the job. High visual excitement is not required or desired in these areas. Because of the intense emotional involvement associated with these aspects of life, the colors worn are generally achromatic.

Considering the emotional responses produced by certain colors, it would be quite appropriate for a speaker to wear colors which would create feelings of warmth, cheerfulness, comfort, and trust in his or her audience. In some instances, one might wish to deliberately create feelings of distance and aloofness. Of course, a speaker must guard against wearing a color which is so "loud" that it drowns out the message.

Various color theories have proven to be useful in therapy, industry, and interior design. However, there is no established system for the use of color by the speaker. The platform speaker, public relations person, politician, salesperson, and the person
who simply wishes to use color to scientifically improve his or her appearance could all benefit from a system showing what colors to wear in a particular lighting situation, when addressing a specific audience, in a particular setting, and concerning a particular type of topic. Of course, as with other color theories, this would not be "the final word" but a useful guide to color in a communication situation. Ultimately, a reference system could be established which would specify such things as the best colors to wear with certain complexions, hair colors, and body types to create the overall desired impression in a specific situation. Color samples could be coded, as are color samples in existing systems, so that a person could create the effect desired on a particular occasion.

Determining if certain garment colors make a difference in the perception of source credibility is an obvious place to start investigation for establishing such a guide. This study concentrates on six chromatic primaries: magenta, cyan, yellow, green, blue, and red. Also, a medium achromatic gray is included.

Although we have been told repeatedly how to dress tastefully in both social and business life, little direct evidence is available on the relationship between clothing and person perception. Further, the author knows of no research which bears
specifically on the question of how garment colors affect source credibility. Stated formally, the research question is as follows:

Does the clothing color of a speaker affect evaluations of her credibility?
METHOD

Subjects and Design

Students enrolled in seven speech communication classes at the University of Central Florida served as subjects. Data collection occurred during the Spring quarter, 1981. The groups of subjects varied slightly in size but contained an approximately equal number of males and females. A total of 165 subjects participated in the seven experimental conditions.

The study utilized a 2 (subject gender) X 7 (speaker's garment color) design. The seven levels of garment color included red, yellow, blue, magenta, cyan, green, and a neutral gray.

Materials

As in a study by Biggers (1979), a projected 35mm color slide of a speaker served as the manipulated visual stimulus for the current study. The same female speaker appeared in each of the seven slides. The color of the garment worn by the speaker was the only factor which varied in the slides. Efforts were made to hold constant other potentially relevant factors such as facial expression, pose, hair style, makeup, background,
lighting, and garment style. All slides were photographed with the speaker appearing against a white background, a sheet of Crescent Illustration Board #100. The lighting conditions were taken in one session with Ektachrome Slide Film 64. The speaker was photographed in a manner which allowed the garment, and consequently the garment color, to dominate the slide area. The speaker was photographed in a manner which allowed only her upper torso, face, and hair to show in the slides. It was necessary to vary the F-stops and shutter speeds used because of the variations in light absorption and reflection due to the use of the different garment colors. If the shutter speed and F-stops had been held constant, some slides would have been excessively under-exposed while others would have been extremely over-exposed. To assure that the correct exposure was used for each slide, a 35mm camera with an accurate light meter was utilized and a fresh battery was installed in the camera immediately prior to the photography session.

It was necessary to hold constant the style and fabric of the garments. The garments chosen for the experiment are often described in 1980's fashion jargon as ladies' T-shirts. They had short sleeves and round necklines. The style was chosen because the size and fabric of the garments facilitated the
dying process. Also, the treatments were administered on a college campus to college students, therefore, a casual shirt of the type chosen was deemed to be appropriate attire for the communicator to wear.

For purposes of repeatability it is important to be able to identify the precise color which was used in each treatment. Due to the inability to locate seven identical garments in the desired hues, it was necessary to purchase seven garments and dye them the appropriate colors. All garments were initially bleached to a consistent white with Rit Color Remover. Each garment except the one which was dyed to represent cyan was placed in the appropriate dying solution for a 20 minute period. After the dye bath, the garments were rinsed until the water appeared to be clear of any residual color. The temperature of the water used in the preparation of each garment was held at the boiling point throughout the dying process.

Rit Tint & Dye colors were used to represent the six spectrum colors and a medium achromatic gray. The colors and corresponding dye numbers were as follows: yellow, Rit Yellow #1; blue, Rit Royal Blue #29; green, Rit Kelly Green #32; magenta, Rit Fuchsia #12; red, Rit Scarlet #5; and gray, Rit Grey #14. Because of a lack of a proper cyan in the Rit Dyes, it was necessary to use two colors to dye the cyan garment. The proper hue was
achieved by placing the garment into a dye bath of Rit Yellow #1 for a 10 minute period, rinsing the garment, then placing it in a 20 minute dye bath using Rit Light Blue #26. A true gray, composed of only black and white, is considered by most color experts to be achromatic, without color, and was used in the experiment as a control condition.

The topic chosen for the tape-recorded speech was from the field of nutrition. The speech was two and a half minutes in duration. A pre-test of the speech, using the social-judgment-involvement approach, was conducted prior to administration of the pilot test in order to determine if the chosen topic could be regarded to be neutral in character. On a seven-point scale, the latitude of rejection was found to be 2.97. This result indicated that the subjects did not have a high degree of ego-involvement with the topic. Thirty-six communication students enrolled in the University of Central Florida served as the subjects for the pre-test which was administered during the Summer 1980 quarter.

Dependent Measure

The dependent variable was the credibility of the speaker. Credibility was operationalized by a six-item semantic
differential. The six items were taken from McCroskey's (1966) scales for the measurement of the major dimensions of source credibility, authoritativeness and character.

In our culture, certain colors are stereotypically associated with women, while others are more often associated with men. Therefore, a difference in perception of credibility may occur due to the sex of the subjects. In order to determine any differences in ratings of the speaker's credibility due to color stereotypes or preferences, each subject was asked to indicate his or her sex on the semantic differential.

Administration and Results of Pilot Test

Communication students enrolled in the Summer 1980 quarter at the University of Central Florida served as subjects for the pilot test. Seven intact classes, ranging in size from 16 to 39 students, provided the data. The classes were composed of an approximately equal number of males and females.

In a darkened room, a taped persuasive speech was played for each group of subjects. Simultaneously, a slide of a woman identified as the speaker was projected onto a screen. The slides used for the seven treatments were identical except for the color of the garment in which the speaker appeared. All other factors
related to the appearance of the speaker were held constant. In addition, the lighting and the environment in which the speaker appeared were identical throughout the slides.

After the speech was played and the slide of the speaker was shown, the subjects were asked to rate the speaker on a six-item semantic differential. In addition, the subjects were requested to indicate their sex by marking the appropriate space. When the subjects completed the questionnaire, the experimenter thanked them for their assistance and collected the forms.

There were several potential biases in the pilot study. Due to class scheduling, it was necessary to administer the treatments in two adjacent rooms. The rooms were very similar with regard to decor, temperature, lighting, and room size. Still, there were slight environmental differences between the rooms such as furniture arrangement and the presence of certain artifacts. It was reasoned that these differences probably had little or no effect on the results since the lights were turned-off during the presentation. In addition, treatment five (cyan) may have been contaminated due to comments made by one subject who had participated in an earlier treatment. His comments may have influenced the other subjects. This is believed to be the case because this treatment produced one
of the most negative ratings of speaker credibility.

The analysis of variance (ANOVA) results of the pilot data revealed significant differences between groups of subjects on ratings of the speaker's credibility with regard to both authoritativeness \((F = 9.31)\) and character \((F = 10.32)\). Subsequent Sheffe tests were conducted in order to determine exactly where the significant differences occurred. The results showed that treatment seven (gray) produced significantly more positive ratings than any other color for both authoritativeness and character. There was a significant difference between the results of treatment three (yellow) and treatment five (cyan) on the character dimension \((F = 18.36)\) and on the authoritativeness dimension \((F = 10.56)\). These results were in favor of the yellow garment in both cases. There was a significant difference on the authoritativeness dimension favoring the yellow over the magenta condition \((F = 14.09)\). Overall, the speaker's credibility was rated least favorably on both dimensions in the cyan and magenta conditions. The results from the other conditions in which the green, blue, and red garments were shown fell between the extremes with very little differences in most cases. The means showed only slight differences related to the sex of the subjects. The largest difference between the means for males and females was 2.70 on the character dimension. This difference was found in treatment six (magenta).
Procedure for Experiment

In order to achieve randomization of treatments, an assistant to the experimenter placed the seven slides in seven unmarked envelopes. The envelopes were then shuffled. Another assistant then drew the envelopes and marked them in sequential order. The seven envelopes containing the slides were then given to the experimenter. Because of this procedure, the experimenter was not aware which slide was to be used for any particular treatment until the beginning of that treatment.

The experimental conditions were conducted in Room 120 of the Education Building on the campus of the University of Central Florida. The room measured approximately 22' by 25' and contained 28 student desks. A rectangular table and a straight-backed chair were provided for the instructor's use. An audio-visual projection screen was permanently installed on the front wall of the classroom.

The experimenter arrived prior to the beginning of each of the seven class sessions in which a treatment was administered. The experimenter arranged the desks in orderly rows, set-up the slide projector, inserted the proper slide into the projector, and secured the screen in proper position for projection
of the slide. The projector was placed in a manner which allowed an image of the speaker to appear in the center of the projection screen. The projected slide provided an approximately life-sized view of the speaker.

The subjects entered the room and were seated. The instructor introduced the experimenter to the subjects as a graduate student who needed their cooperation for the first few minutes of the class. At this point, the experimenter said, "I'm going to play a short speech for you and show you a slide of the speaker simultaneously." Then, the lights were turned off, the slide was projected, and the speech was played. In the darkened room, the projected slide actually served as the visual environment for this communication. The taped speech became the audio environment. The experimenter observed no verbal interaction between the subjects in the various treatment sessions. The subjects appeared to be concentrating on the speaker and her message.

When the taped message was concluded, the tape recorder and the projector were turned off. The semantic differential was distributed and the subjects were asked to complete the questionnaire in order to rate the speaker. Then, the experimenter collected the questionnaire and thanked the subjects
for their help. Subjects were informed of the nature and purpose of the experiment during the following week.
RESULTS

Data for this study consist of the mean belief levels for male and female subjects on the authoritativeness and character dimensions of source credibility. The mean levels for authoritativeness are summarized in Table 1.

Table 1
Mean Belief Levels on Authoritativeness
Produced by All Treatments

<table>
<thead>
<tr>
<th></th>
<th>Yellow</th>
<th>Magenta</th>
<th>Gray</th>
<th>Red</th>
<th>Green</th>
<th>Blue</th>
<th>Cyan</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Females</td>
<td>10.40</td>
<td>10.73</td>
<td>10.00</td>
<td>10.83</td>
<td>10.58</td>
<td>9.73</td>
<td>10.22</td>
<td>72.49</td>
</tr>
<tr>
<td>Males</td>
<td>9.44</td>
<td>9.92</td>
<td>11.00</td>
<td>9.73</td>
<td>9.50</td>
<td>10.33</td>
<td>9.57</td>
<td>69.49</td>
</tr>
<tr>
<td>Total</td>
<td>19.84</td>
<td>20.65</td>
<td>21.00</td>
<td>20.56</td>
<td>20.08</td>
<td>20.06</td>
<td>19.79</td>
<td>141.98</td>
</tr>
</tbody>
</table>

The purpose of this study was to determine if the garment color worn by a speaker would affect her source credibility. A secondary purpose was to determine if the credibility of the speaker would be judged differently by male and female subjects in the audience.
A 2 X 7 ANOVA (two levels of sex of subjects and seven levels of garment color) was conducted on the authoritativeness dimension of credibility. Table 2 contains the ANOVA summary for authoritativeness.

Table 2
ANOVA Summary of Effects of Sex and Garment Color on Authoritativeness

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex</td>
<td>7.05</td>
<td>1</td>
<td>7.05</td>
<td>1.57</td>
</tr>
<tr>
<td>Color</td>
<td>6.94</td>
<td>6</td>
<td>1.16</td>
<td>.26</td>
</tr>
<tr>
<td>Interaction</td>
<td>2.22</td>
<td>6</td>
<td>.37</td>
<td>.08</td>
</tr>
<tr>
<td>Error</td>
<td>679.83</td>
<td>151</td>
<td>4.50</td>
<td></td>
</tr>
</tbody>
</table>

The ANOVA summary on authoritativeness indicates that the differences in the means for the main effects of sex and color do not reach conventional significance levels and, therefore, must be attributed to chance. In addition, the interaction between garment color and sex on the authoritativeness dimension was non-significant. The mean levels for the character dimension of credibility are summarized in Table 3.
Table 3
Mean Belief Levels on Character
Produced by All Treatments

<table>
<thead>
<tr>
<th></th>
<th>Yellow</th>
<th>Magenta</th>
<th>Gray</th>
<th>Red</th>
<th>Green</th>
<th>Blue</th>
<th>Cyan</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Females</td>
<td>21.73</td>
<td>22.64</td>
<td>22.33</td>
<td>21.00</td>
<td>19.33</td>
<td>19.27</td>
<td>20.33</td>
<td>146.63</td>
</tr>
<tr>
<td>Males</td>
<td>20.44</td>
<td>20.25</td>
<td>20.00</td>
<td>18.20</td>
<td>17.85</td>
<td>20.33</td>
<td>20.21</td>
<td>137.28</td>
</tr>
<tr>
<td>Total</td>
<td>42.17</td>
<td>42.89</td>
<td>42.33</td>
<td>39.20</td>
<td>37.18</td>
<td>39.60</td>
<td>40.54</td>
<td>283.91</td>
</tr>
</tbody>
</table>

In order to determine if the differences in the means for the character dimension reach statistical significance, a subsequent $2 \times 7$ ANOVA was conducted. Table 4 contains the ANOVA summary. As indicated in Table 4, results for the main effect of sex did closely approach significance ($3.87, p < .06$). This finding indicates a tendency for female subjects to evaluate the speaker higher in character than do male subjects. Differences in the means for the main effect of color did not reach conventional significance levels. In addition, the ANOVA produced a non-significant interaction between sex and color.
Table 4
ANOVA Summary of Effects of Sex and Garment Color on Character

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex</td>
<td>68.88</td>
<td>1</td>
<td>68.88</td>
<td>3.87</td>
</tr>
<tr>
<td>Color</td>
<td>139.73</td>
<td>6</td>
<td>23.29</td>
<td>1.31</td>
</tr>
<tr>
<td>Interaction</td>
<td>63.03</td>
<td>6</td>
<td>10.51</td>
<td>.59</td>
</tr>
<tr>
<td>Error</td>
<td>2,690.67</td>
<td>151</td>
<td>17.82</td>
<td></td>
</tr>
</tbody>
</table>
DISCUSSION

Biggers (1979) established that the environment affects the perceived credibility of the speaker. Other studies such as Deutsch (1937) and Goldstein (1942) show that color in the environment affects human behavior. A speaker's garment color is obviously an environmental factor. Therefore, it was reasoned that manipulating this factor may affect the behavior of the subjects in a manner which could influence their perception of the speaker's credibility.

Restated, the purpose of this study was to determine if a speaker's credibility would be affected by the color of her clothing.

Due to the results of the pilot study, it was expected that conventional significance levels would be reached on both dimensions of source credibility as a result of varying the color of the garment worn by the speaker. The fact that the results of the treatments differed from the results of the pilot study is likely due to a lack of control in the pilot study. As was previously mentioned, the pilot study had several
methodological shortcomings. Due to the use of improved controls in the actual experiment, the author is inclined to attribute any discrepancies to faulty controls in the pilot study.

The differences in means on both dimensions can be readily observed by reading Tables 1 and 3. In no single instance did the results reach conventional significance levels. The overall results indicate that the female speaker in a casual speaking situation may feel free to wear any of the colors used in this study without fear of losing credibility because of traditional stereotypic sex/garment color ideas or other associations related to colors.

While there are no statistically significant contrasts in the study, it is of interest to identify certain trends in the data. First, female subjects rated the speaker higher than the male subjects on the authoritativeness dimension for all except the gray condition. And on the character dimension, the female subjects rated the speaker higher than the male subjects in all but the blue condition. The overall higher rating on the part of the female subjects may be attributed to the fact that women have traditionally worn colorful clothing in our society. The use of bright color in the garments was viewed more favorably by the women possibly because they expect to see other women attired in brightly-colored clothing. Women may accept this attire in a
business situation more so than do the male subjects. The two colors which were rated higher by the male subjects than by the female subjects were gray on the authoritativness dimension and blue on the character dimension. These colors have been traditionally worn by businessmen and were perhaps judged by the males as more appropriate because of that association. Males may perceive these colors to be more appropriate for a speaker to wear.

In the pilot study, gray was rated significantly higher on both dimensions of credibility than were any of the other colors. In addition, yellow was rated significantly higher than several other colors on both dimensions. In agreement with the findings from the pilot study, results of the subsequent treatments indicate that gray and yellow were among the three highest rated colors in the overall credibility of the speaker as perceived by male and female subjects as a group. However, in direct contrast with the pilot study, magenta was rated highest in overall credibility by males and females combined. In the pilot study, magenta received one of the two lowest ratings.

The major implications for communication theory are that the female speaker may wear any of the colors considered in this study without doing so having a negative effect on her credibility. Analyzing the results closely indicates that for overall credibility males rated gray highest, followed by blue and magenta.
Females gave magenta the highest rating with gray and yellow following closely.

Molloy (1977) asserts that a woman should wear gray and other colors considered to be conservative in the business world as those colors are most often worn by businessmen who are successful. Results of the present study show that the speaker's credibility is not rated significantly higher when she appears in gray. This indicates that at least for the casual speaking situation the bright spectrum colors are also appropriate for the female speaker to wear. The conservative speaker may choose to wear those colors given the highest ratings as they may actually serve to enhance her credibility. However, this is only speculation at the present time as these ratings may have occurred by chance.

Gelman (1981) cites classic experiments in which observers were asked to describe infants who were dressed in blue, pink, and yellow diapers. The babies in the blue diapers were described as very active. The same babies when dressed in pink were described as gentle. The observers became upset when seeing the infants in yellow diapers and began to peak under their diapers in order to determine their sex.

As the above study illustrates, certain stereotypic ideas exist between sex and certain colors. Six of the colors used
in this study were intense spectrum colors. Furthermore, with the exception of red, there is no particularly well-known association between women in general and any of the colors in the study. Red, of course, is associated with the vamp. Though possibly coincidental, males rated the speaker rather low on credibility, especially on the character dimension, when she appeared wearing the red garment. Females rated the speaker much higher when she appeared in the red garment.

Bright colors such as six of those used in the study were identified as those preferred by children in the previously mentioned study by Staples (1932). It is quite possible that adults would prefer bright colors in general to tints of those same colors. The author strongly suspects that if the study used several variations of the same colors instead of six bright colors the results would be very different. For example, three variations of red could have been used: a spectrum red; a tint of the same red, with white added; a shade of the same red, with black added, etc.

The slide format has been used repeatedly in studies on credibility. One major advantage of this format is the level of control available. In a live presentation the audience would be exposed to extraneous visual stimuli not included in the slide. The isolation of color is difficult, if not impossible, in a
live speaking situation. Total isolation of garment color and speaker from the surrounding environment is not likely. It is feasible to speculate, however, that the attention of the audience would be focused on the speaker. Given this focused attention, the verbal presentation and the nonverbal factors of overall appearance and clothing of the speaker come into dominant focus. The slide format allows for concentration on the factors being studied while also allowing for a high degree of control.

An aspect obviously missing from the slide presentation is movement. A live presentation would certainly include gestures and facial animation which are missing in a slide of a speaker. While the slide method is lacking this aspect of realism, it is preferential to the live appearance because of the degree of control inherit in the method.

Many studies have been conducted on the effects of color on the individual. In addition, a large number of studies have been conducted on the concept of source credibility. This is the only study known to the author which concentrates on the effects of isolated color and speaker credibility. A single color interacts with all other colors in a given environment creating a multitude of visual sensations. Careful consideration was given to this fact within the context of this study. The garment color in the slide most definitely interacts with the complexion and hair
color of the speaker. There are vast differences in personal coloring within the human species. As a starting point, one of the many various combinations of complexion, hair color, and eye color had to be chosen. Brown hair, hazel eyes, and olive complexion is representative of many individuals. Therefore, a model with this particular coloring was chosen to appear as the speaker in this initial study. Since a given color interacts with all others in its immediate surroundings, generalization of the current results is limited to similar parameters.

As was previously mentioned, certain colors are associated more strongly with males and others with females. Therefore, the relationship between a garment color and credibility would likely differ between male and female speakers. The results are generalizable only to female speakers.

Finally, the results are generalizable only to those seven particular colors used in this study. The results may have differed greatly if other colors had been utilized.

Future research could include the use of other colors within a similar paradigm. Perhaps tints of the same colors used in this study or, as previously mentioned, variations of several colors may be utilized in future research.
Use of a male speaker would likely produce results which would be very different from those obtained in the present study and would be a logical idea for future research.

Although the speaker in the present study is considered to be attractive by many people, her perceived attractiveness was not determined prior to the treatments. The attractiveness of a speaker affects her perceived credibility. Therefore, it would be worthwhile in future experiments to determine if the colors which are utilized affect perceived attractiveness as well as credibility.

The only dependent variable considered in the present study was the speaker's credibility. The degree of persuasion produced by the message was not measured. Since credibility and attitude change are related, it would be useful in the future to measure the effect of garment color on both of these dependent variables.

In addition, the dimension of dynamism was not measured in the present study because it functions primarily to intensify the other major dimensions. Measurement of this third dimension of credibility along with authoritativeness and character may be a worthwhile area for future investigation.

Any combination of the above factors could be considered as possibilities for future research on the effects of speaker's garment color on source credibility.
This is an initial study on the effects of speaker's garment color on source credibility. As such, it serves as a springboard for additional related studies on the phenomenon. Much future research must be compiled on the overall effects of the garment color worn by a speaker on the perception of source credibility before any far-reaching conclusions can be drawn on the subject as it pertains to all speakers.
SUMMARY

The purpose of this study was to determine if the garment color worn by a speaker would affect her perceived credibility. A secondary purpose was to determine if the sex of a subject would influence the manner in which he or she rated the speaker's credibility.

The study utilized a 2 X 7 design (two levels of sex of subject and seven levels of garment color). The colors used were the six spectrum primaries: red, green, blue, cyan, magenta, and yellow, as well as a medium achromatic gray. Each of seven groups of subjects was shown a slide of the speaker appearing in one of the seven colors. Meanwhile, a short taped persuasive speech was played for them. Then the subjects completed a semantic differential rating the speaker on the two major dimensions of credibility, authoritativeness and character.

Results indicate that the speaker may wear any of the colors used in the study in a casual speaking situation without producing a negative effect on her credibility. The conservative speaker may choose to wear those colors given the highest ratings as they may actually enhance her credibility. However, this is only speculation at the present time as these ratings may have admittedly
occurred by chance. Differences in the means for the main effects of sex and color did not reach conventional significance levels on either dimension of credibility. In addition, no statistically significant interaction was found between color of garment and sex on either dimension of credibility. However, the main effect of sex closely approached significance on the character dimension ($3.87, p < .06$). The females rated the speaker higher on the character dimension than did the males.

Suggestion for future research include the study of the effects of additional garment colors on the concept of source credibility as well as consideration of the effects of garment color on the credibility rating of the male speaker.
APPENDIX A

The Speech
The Golden Egg

Eggs are held in high regard by the little barnyard chicken who lays them. The egg is her most perfect accomplishment. Eggs are held in high regard also by many people who recognize them as one of nature's most perfect foods. The egg is a balanced source of all the important vitamins and minerals except for vitamin C. An average-sized egg contains 6 grams of complete protein.

There has been a lot of adverse publicity linking the egg and cholesterol, but the egg is actually only a partial contributor to dietary cholesterol. In order to cut down on the overall intake of cholesterol, one may choose to reduce the amount of animal fat consumed in the forms of meat, milk, butter, cheese, and other whole milk dairy products, instead of totally eliminating eggs from the diet.

I'm not advising you to go against the advice of your doctor. However, several doctors have admitted to me that they know very little about nutrition because they are too busy keeping up with advances in medicine. That, of course, is of most importance to them and to their patients.

Do make use of this fantastically versatile, nourishing food, the egg! There are several egg replacers on the market today designed to serve those people on a restricted cholesterol diet. Basically these are egg white preparations with added starch, non-fat milk, and some vitamin enrichment. These are available in both dried and liquid forms. The inclusion of chemical additives is left to the discretion of the manufacturer. These egg substitutes only approximate rather than duplicate the nutrition of farm fresh eggs. They are a valuable dietary aid for those with a cholesterol problem, in much the same way that artificially sweetened jams are an aid for diabetics. They are not, as the manufacturers claim, in the same class as the "most perfect egg".

The precise balance of nutrients in a real egg amounts to dietary gold. The egg is a food most of us can enjoy.
APPENDIX B

Semantic Differential
EVALUATION OF SPEAKER

Please evaluate how you feel about the speaker by placing an X at the point on each scale which best represents your feelings.

In my opinion, the speaker is:

- Intelligent
- Friendly
- Pleasant
- Honest

Virtuous

 Reliable

 Unintelligent

 Unfriendly

 Unpleasant

 Dishonest

 Sinful

 Unreliable

Please indicate (X) your sex. Male____ Female____
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