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# The effect of background color and instructions on voting behavior

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# THE EFFECT OF BACKGROUND COLOR AND INSTRUCTIONS ON VOTING BEHAVIOR

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Abstract

The effect of background color and instructions on voting behavior was investigated. Ninety subjects from the San Jose State University subject pool served in three conditions. Instructions were manipulated across conditions so that in the full instruction condition background color would be irrelevant and subjects would vote on the basis of informational content. Even though research on this subject revealed no significant interaction for the color and instruction variables, there was a trend in the direction predicted. Based on data reported by Beatty and Cloud (1990) it was hypothesized that gray would be the color of preference, but in this study black was preferred in all conditions.

# The Effect of Background Color and Instructions on Voting Behavior

Jane Christine Beatty

The association between color and emotion has led advertisers and politicians to use color as an important tool for motivating consumers and voters (Walters, 1989). Researchers know that toothpaste cannot be sold in a plain brown tube. They also know that promoting Salem menthol cigarettes with the color green, which is associated with freshness, nature, and fertility, will help sell the product no matter what the Surgeon General says (Walters, 1989). The background colors of political campaign posters have a significant influence on the judgement of the personality characteristics of politicians associated with them (Rubinoff & Marsh, 1980). For example, male politicians who used white lettering on a blue background were seen as extroverted, while those with orange lettering on a blue background were seen as more introverted. For female politicians, those using white lettering on a blue background were seen as honest, and those with orange lettering on a blue background were seen as dishonest. Background color also has an effect on voting behavior when college students are voting for fictitious candidates (Garrett & Brooks, 1987). When subjects chose between pink and green backgrounds with equivalent political platforms mounted on them, males preferred the green backgrounds and females preferred the pink backgrounds. Uniform color has been shown to affect

both the behavior of the player and the judgement of the referee. Teams that wore black uniforms were judged to be meaner and more aggressive than teams wearing uniforms of another color. Black uniformed teams received substantially more penalties from referees during the 16 year period under investigation (Frank & Gilovich, 1988).

The color black has been long associated with night, mystery, somberness, melancholy, evil, and death (Andreasen, 1985). We have lived with these associations through most of our lives. When we watched the westerns on TV, we could always tell the good guys from the bad guys, because the bad guys wore the black hats. This was not unique to TV. The roots of this connection between black and evil extend deep into our culture and language. We can have a dark chapter in American history, or we can have a black day. We can blacken our reputation or that of others. We can be blacklisted, blackballed, or blackmailed (Frank & Gilovich, 1988).

The color gray is associated with quiet, calm, neutrality, and depression (Andreasen, 1985). Cheskin (1954) defined gray as half white and half black, not really experienced as negative or positive. He called black a perfect negative. It reflects no light, and it is associated with death. Although gray is considered a neutral color, a marketing survey revealed gray to be a favorite among many men (Cheskin, 1954).

Because black is reported to produce more negative reactions, and gray produces more neutral reactions, we felt it would be worthwhile to investigate whether black and gray backgrounds would affect voting behavior (Beatty & Cloud, 1990). We found that students were more likely to vote for the campaign platform that was mounted on a gray background than they were for an equivalent platform mounted on a black background. The students were simply asked to vote for the platform they liked the best. They were not given any other information or instructions, and they were not told that we were looking for effects produced by the background color of the platform that they chose.

M. J. Beatty (1988) studied decision making in college students. His subjects were asked to read paragraphs about problem situations and then choose between alternative solutions. The control group received written paragraphs and no additional information. The second group received the paragraphs with decision matrices that showed relevant information translated into analytical form. The third group was given instruction in the use of decision rules before being presented with the paragraphs. The last group received the instruction and decision matrices along with the paragraphs. Twenty-five undergraduates participated in each group. Beatty found that instructions increased the amount of information relevant to the choice being made. The group with the most relevant information (the last group) relied more on that information and less on irrelevant variables than the groups with little

or no instruction. The choices made within that group were more consistent and less random than the choices of the other three groups.

Students are often asked to find the most desirable solution but they are not taught how to choose the best alternative among the possible solutions. Since humans are only capable of handling a limited amount of information at any given time, simplistic and inadequate strategies are frequently used to make choices when specific instruction and information are not given. The decision may be based on irrelevant data if the subject has not been able to identify and filter out what is not important. In the Beatty and Cloud (1990) study, inadequate strategies were probably used in decision-making when students voted for the gray background over the black, because the platforms were previously judged equivalent when they were mounted on identical backgrounds.

In the present study, instructions to subjects and background color were independent variables. Students in Condition 1 were asked to read two voter platforms mounted on different backgrounds and then indicate which platform they preferred. No other instructions or information were given to this group. Students in Condition 2 were told that the experimenter would be specifically looking for effects of the background color of the platform that they choose. They were not given information about how background color affects voter choice. Students in Condition 3 were given a short lecture on how background color has

been shown to make a difference in the way people vote. After the short lecture, the materials were distributed and the students were asked to indicate which platform they preferred.

If instructions help subjects identify and filter out irrelevant data, then the group given the least instruction was expected to vote on the basis of background color and not on the content of the platform. The second group was expected to be aware of the background color, due to added information, and therefore focus mainly on the platforms. The third group should have had enough information so that the background color was irrelevant, and the platform was chosen on the basis of informational content.

## Method

### Subjects

Ninety lower-division students were recruited from the psychology department subject pool at San Jose State University.

### Materials

Two political platforms (see Appendixes A and B for complete platforms) previously judged to be equivalent were typed in black letters on a white background and mounted on 8 1/2 x 11 inch construction paper, one statement on black and the other on gray. The statements were completely counterbalanced so that each statement appeared on a black background 50% of the time and on a gray background 50% of the time. These platforms were placed inside a large envelope

that was marked "experiment." Attached to the outside of the large envelope were two consent forms and a small envelope marked "consent form."

Procedure

The experiment was conducted on a Sunday morning. Undergraduate psychology department subject pool members were invited to participate. When a small group of subjects were seated in the classroom, a statement of information was read (see Appendix C for complete statement) and then subjects were given instructions specific to the condition they were participating in (see Appendix D for complete instructions).

Each group of subjects was assigned to a different condition and conditions were counterbalanced to control for extraneous variables and the possibility of other experiments affecting the subjects. Students took approximately 8 minutes to complete the experiment, including reading and signing the consent form. A debriefing statement was given to each participant as materials were collected.

## Results

To see if the platforms could be considered equivalent in this experiment, the data was analyzed by collapsing across color, the counterbalanced variable, and counting the number of platforms chosen from Appendix A and Appendix B. The political platform from Appendix A was chosen 43 times and the political platform from Appendix B was chosen 47 times. This difference was not significant, chi-square (1, N

= 90) = .17, $p>.25$. The background color variable was analyzed by collapsing across platforms and conditions and counting the number of black and gray backgrounds chosen. Black was chosen by 53 out of 90 subjects and was preferred in every condition, but the chi-square for color was non-significant, chi-square (1, $N$ =90) = 2.84, $p<.10$.

Table 1

Background color chosen as a function of instruction conditions, total color chosen, and test for platform equivalence.

| | Instruction Conditions | | | | |
|---|---|---|---|---|---|
| | 1 | 2 | 3 | Total Color | Platform |
| Gray | 11 | 13 | 13 | 37 | (A) 43 |
| Black | 19 | 17 | 17 | 53 | (B) 47 |

The study was expected to show a significant difference between the background color for the no instruction condition, non-significant differences for the instruction conditions, and therefore an interaction of color and instruction. While the no instruction group chose more black backgrounds than either of the other groups, the chi-square was still non-significant, chi-square (1, $N$= 30) = 2.13, $p<.25$. The same

and full instruction groups gave identical non-significant results, chi-square (1, $N$ = 30) = .53, $p$>.25. A 2 X 3 chi-square analysis was used to test for an interaction of color and instruction, but it did not reach significance, chi-square (2, $N$ = 90) = 3.20, $p$<.25. A 2 X 2 analysis was performed to test for interaction of color and instruction using the group with no instruction (Condition 1) and the group with full instruction (Condition 3). The no instruction group should have been influenced by background color and the full instruction group should have had enough information to filter out the background color. This analysis resulted in a chi-square that did not reach significance, chi-square (1, $N$ = 60) = 2.66, $p$<.25. A second 2 X 2 analysis was performed using the group with no instruction (Condition 1) and the combined groups with any instruction (Conditions 2 & 3). This analysis allowed a more thorough exploration of the instruction variable, but it did not reach significance, chi-square (1, $N$ = 90) = 3.20, $p$<.10.

While statistical significance using raw data is important for rejection of the null hypothesis, receiving more than 50% of the vote is what actually wins an election. When the data for total color is converted to percentages, 59% voted for the black background and 41% voted for the gray background. The z score for 50% was computed using 59% as the mean and 5.2 as the standard error of percentage. This means that we can predict with 96% confidence that the black background would win the election by receiving over 50% of the vote. When the no

instruction condition (Condition 1) raw data is converted to percentages, 64% voted for the black background and 36% voted for the

Table 2

Percent of background color chosen as a function of instruction conditions, total color chosen, and test for platform equivalence.

| | Instruction Conditions | | | | |
|---|---|---|---|---|---|
| | 1 | 2 | 3 | Total Color | Platform |
| Gray | 36 | 43 | 43 | 41 | (A) 48 |
| Black | 64 | 57 | 57 | 59 | (B) 52 |

gray background. The z score for 50% was computed using 64% as the mean and 8.76 as the standard error of percentage. This means that we can predict with 94% confidence that the black background would win the election in Condition 1 by receiving over 50% of the vote. For the some and full instruction conditions (Conditions 2 & 3), 57% voted for the black background and 43% voted for the gray background. The z score for 50% was computed for both conditions using 57% as the mean and 9 as the standard error of percentage. We can be 78% confident that the black background would win this election by getting over 50% of the vote.

## Discussion

The choice of color contradicts information collected a year ago. Gray was chosen significantly more times than black in 1990 as predicted, but black was preferred over gray in all conditions in 1991. Thirty-three subjects participated in the no instruction condition of the experiment in the spring of 1990. Each subject voted twice so 66 pieces of background color information were collected. Of those, 42 statements with gray backgrounds and 24 statements with black backgrounds were chosen. A chi-square analysis revealed a relationship between the choice made by the subject and the background color, chi-square (1, $N$ = 33) = 4.90, $p<.05$ (Beatty & Cloud, 1990). Converted to percentages, 64% voted for the gray background and 36% voted for the black background. Computing the z score for 50% using 64% as the mean and 6 as the standard error of percentage, we can predict with 99% confidence that the gray background would win the election by receiving over 50% of the vote.

All subjects voted twice in 1990. This not only increased the sample size in relationship to the number of subjects, but may have affected the outcome as far as background color choice. Only 4 students who voted for the black background once voted for it a second time, 16 voted for one black background and one gray background, and 13 voted for the gray background both times. This resulted in a significant chi-square for combined choices made, chi-square (2, $N$ = 33) = 7.08, $p<.05$.

Since most political polls take a random sample of 1500 to 2000 voters, an increase in the sample size for this voting experiment may be necessary to reduce our standard error term, lower our 95% confidence interval to under 5%, increase the external validity of the experiment, and determine if there is a significant effect.

The shift in color preference from gray in 1990 to black in 1991 remains a mystery. Rosenthal and Rosnow (1984) state that replication of an experiment with a strong effect, such as the 1990 experiment, may be crucial in determining if this effect is repeatable. This must be a "relatively exact" replication in order to judge the stability of the original result. Three variables that strongly affect the value of a particular replication according to Rosenthal and Rosnow are when, how, and by whom the replication is conducted.

There may be important differences in when the replication and the original experiment were conducted. The 1990 experiment was conducted on weekdays during regular upper division psychology class sessions. No special arrangements had to be made by the students to participate in the experiment. The 1991 experiment was conducted on a Sunday morning. Students had to get up early on a "day off" to take part in a number of experiments for extra credit in their general psychology course.

There may be important differences in how the two experiments were conducted. In 1990 we walked into the classroom and were introduced to the class by the professor. This introduction may have affirmed us and

legitimized the experiment. The instructions were read and the experiment was carried out in a formal classroom setting with a large group of students participating each time. These students were prepared to participate in regular class activities so the experiment may have been an interesting break in their routine. The 1991 experiment was conducted informally with no introduction from a professor. Students in the psychology department subject pool went from room to room participating in various experiments for approximately 3 hours. We began the experiment when a small group of students were ready.

Experimenter effects such as sex and age are important characteristics that influence the outcome of an experiment (Ray & Ravizza, 1985). My sex and age differed from my colleague as well as from the professors who introduced us. Subjects may have responded to the experiment in a different way because of this. Subject characteristics can influence the replication of an experiment. The 1990 subjects were upper division psychology majors and the 1991 subjects were San Jose State University students enrolled in a general psychology course. There are important differences between psychology and non-psychology majors as well as between lower division and upper division students. Upper division psychology majors may see educational benefits in their participation while lower division non-psychology majors may have been motivated to participate only by the extra credit given (Ray & Ravizza, 1985). The 1991 subjects may have been influenced

in some way by their participation in other experiments. Most students spent at least an hour reading and signing consent forms, reading or listening to verbal instructions, answering a variety of questions, doing memory tasks, motor tasks, or making other kinds of choices. They may have been tired and disinterested by the time they walked through my door.

Historical events can threaten the internal validity of an experiment. What happened between 1990 and 1991 could have affected the outcome of the experiment. Gold (1984) found that depression scores could be high during an economic unstable period and drop significantly after an event such as the opening of a large plant in the area. Gold (1970) also found that his study on attitude change toward student activism may have been confounded by increased acts of violence on campus. If the 1990 and 1991 experiments were sensitive to the mood states of the subjects, and the subjects were upset about the war with Iraq, then black may have replaced gray as the preferred color because of its association with the negative (Adreasen, 1985).

Even though there was no significant interaction for the color and instruction variables, there was a trend in the direction expected. The no instruction group (Condition 1) was expected to vote on the basis of the background color and not on the content of the platform. They were expected to vote for the gray background over the black background. The black background won this election, and with 94% confidence we can

predict that the black background would receive over 50% of the votes. The black background also won the election for Conditions 2 & 3, but we can only be 78% confident that it would receive over 50% of the votes. This may mean that the added instruction the subjects received in Conditions 2 & 3 helped them filter out irrelevant information and focus on the informational content of the platform.

Further research may be needed to discover why gray was preferred in 1990, black was preferred in 1991, and the instruction variable in 1991 did not reach significance. We could take a closer look at the color variable by researching the effect of mood on color choice. Half of the subjects could read a newspaper article that may make them temporarily depressed (such as an article about the war with Iraq) and the other half a newspaper article that may make them feel good (such as an article about the successful rescue of a small child). Subjects would be asked to vote for a political platform immediately after reading the article. The POMS (Profile of Mood States) could be administered after the vote to see if the emotions had been successfully manipulated. The instruction variable could be tested by giving one group of subjects no information and the other group of subjects written instructions and decision matrices relevant to the political topic in question. Subjects with instructions could then filter out the irrelevant information and focus on the relevant issues of the platform. Those with more information would be expected to make more

consistent choices, or if the platforms are equivalent, each platform would receive about 50% of the votes. Color will continue to be used to manipulate consumers and voters, therefore it is essential to understand how color and instruction affect the choices people make.

References

Alloy, L. B. & Abramson, L. Y. (1979). Judgment of contingency in in depressed and nondepressed students: Sadder but wiser? Journal of Experimental Psychology: General, 108, 441-485.

Andreasen, M. E. (1985). Make a safe environment by design. Journal of Gerontological Nursing, 11, 18-21.

Beatty, J. C. & Cloud, E. (1990). Possible bias in decision making: Choosing between equivalent statements. Unpublished manuscript. San Jose State University, Psychology Department, San Jose.

Beatty, M. J. (1988). Increasing students' choice-making consistency: The effect of decision rule-use training. Communication Education, 37, 95-105.

Cheskin, L. (1954). Color guide for marketing media. New York: Macmillan.

Frank, M. G., & Gilovich, T. (1988). The dark side of self-and social perception: Black uniforms and aggression in professional sports. Journal of Personality and Social Psychology, 54, 74-85.

Garrett, J. C., & Brooks, C. I. (1987). Effect of ballot color, and sex of college students of voting age on their voting behavior. Psychological Reports, 60, 39-44.

Gold, J. A. (1984). Principles of psychological research. Illinois: The Dorsey Press.

Ray, W. & Ravizza, R. (1981). Methods. California: Wadsworth.

Rosenthal, R. & Rosnow, R. L. (1984). Essentials of behavioral research: Methods and data analysis. New York: McGraw-Hill.

Rubinoff, M. R., & Marsh, D. T. (1980). Candidates and color: An investigation. Perceptual and Motor Skills, 50, 868-870.

Walters, C. G. (1989). Consumer Behavior. Cincinnati: South-Western.

Appendix A

Dear Friend:

We live in a time of great transition as we move toward the next century. These next several years present a rare opportunity for our area.

I believe our area desperately needs more effective leadership and that is why I am running for Congress.

I feel a strong commitment to our future and to this my home, where I was born and raised. In the coming months I will take my message throughout the district, house to house, factory to factory, and person to person.

We must have leadership in Congress that can get results to grow to our potentials. I am willing to put my experience in Washington and commitment to our area on the line to build a better future for all of us.

Appendix B

Dear Friend:

These next several years present a rare opportunity for our area. It is a time of great transition as we move toward the next century.

I am running for Congress because I believe our area desperately needs more effective leadership.

I was born and raised here, and feel a strong commitment to my home and our future. In the coming months I will take my message house to house, person to person, factory to factory throughout the district.

To grow to our potential, we must have leadership in Congress that can get results. I will put my experience in Washington and commitment to our area on the line to build a better future for all of us.

Appendix C

My name is Jane Beatty, and I am a graduate student in the M.A. Psychology program here at San Jose State University. I have designed an experiment that will allow me to see what choices people make. You will be asked to read two short political statements and choose between them. This experiment should take about eight minutes to complete including signing the consent form. Your participation is completely voluntary. You are free to withdraw at any time. Your decision to participate or not will not affect your standing in this university in any way. This experiment is completely anonymous, no name will be connected with the data. When all materials are returned to me, I will pass out a written statement that will detail why I asked you to make the choice. The statement will have my name and phone number so that you may call me if you are interested in the results of this study.

Appendix D

Group I

Read the two political platforms and choose the one that you prefer by circling the entire statement.

Group II

Read the two political platforms and choose the one that you prefer by circling the entire statement. I am specifically interested in the color of the background of the platform that you choose.

Group III

Last year I did a study to find out if the color of the background would affect how people vote. I was particularly interested in how people would vote if they had to choose between gray and black backgrounds. When I complete my study, I found that students were more likely to vote for a political platform that was mounted on a gray background than they were for one that was mounted on a black background.

Read the two political platforms and choose the one that you prefer by circling the entire statement.