

AN INVESTIGATION OF THE RELATIONSHIP BETWEEN
COLOR CHOICE AND DEPRESSION MEASURED BY
THE BECK DEPRESSION INVENTORY¹

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Summary.—The relationship between self-reported depression and color preference was investigated. It was proposed that a cognitive schema would be activated affecting negatively that part of the environment selected for cognitive preference. When requested to select a series of preferred colors, the 72 undergraduates scoring above 10 on the Beck Depression Inventory tended to choose black or brown. It is believed that internal schema represented in 3 questions may be reflected in color choice(s).

Beck (1967) advanced a cognitive view of depression which is composed of the triad of a negative concept of self, a negative interpretation of life experiences, and a nihilistic view of the future. He stated that depressed individuals cognitively distort events in the world around them. Negative self-statements, both internal and verbal, are made on the basis of cognitive schema which are relatively stable. A schema was defined as a stable cognitive pattern of responses to events which were similar. People who are depressed tend to perceive situations more negatively even when there are positive interpretations which are plausible.

Relationships between depression and many different measurements have been investigated. These measures include reaction to similar or identical events (Kovacs & Beck, 1978), reaction to pain (Sprock, Braff, Saccuzzo, & Atkinson, 1983), recall of experiences (Beck, 1961; Beck & Hurvich, 1959; Beck & Ward, 1961), processing of information (Derry & Kuiper, 1981), and negative bias in depression (Gotlib, 1983).

Although colors are commonly believed to be related to different emotions, this belief has seldom been investigated. Williams and Nulty (1986), in their study of stability of mood states, reported that color naming of negative versus neutral words was more stable in individuals who had been depressed to some extent for twelve months. Their findings support Gotlib and McCann (1984) who stated, on the basis of their research on color naming, that this negative inference is reflective of stable biases which are easily accessed in depression-prone individuals.

Perhaps a person's mental state activates the internal schema which de-

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termine what part of the environment will be selected for cognitive preference. As color is a prevalent stimulus in most individuals' lives, mental state may affect preference for specific colors. The present purpose was to explore the relationship between self-reported depression and color selection.

METHOD

Participants

Subjects were 261 (187 female and 74 male) undergraduate students at a southeastern university. The racial distribution included 235 Caucasian and 26 African-American students. Entire classes volunteered for the research and were assured of anonymity. They were not informed of the purpose of the research. Given missing data, only 254 subjects' scores are used in the following analysis.

Materials

The students were provided a packet of three pages, a covering sheet on which demographic information such as year in school, race, sex, major, age, marital status, and living arrangements were recorded, 10 questions to be answered, and directions for completion. A list of questions is presented in Table 1.

TABLE 1
QUESTIONS FROM PAGE 1 OF THE RESEARCH PACKET

1. Which color best describes your current mood?
2. Which color best represents how you would like to feel?
3. Which color makes you feel the most comfortable?
4. Which color makes you feel the least comfortable?
5. Which color is your favorite?
6. Which color would you prefer to have your classrooms painted?
7. Which of these colors would you wear to feel the most attractive?
8. Which color makes you feel happy?
9. Which color makes you feel sad?
10. If you could choose one color which best represents you, which one would it be?

Each student was given a separate sheet of paper on which to respond to these questions. On this paper were printed seven colors (blue, black, red, brown, yellow, white, and green) in 2-in. squares. There were seven counter-balanced versions of the color sheet so effects of the order of the colors could be assessed. On the third page of the packet was printed the Beck Depression Inventory which was not identified as a test of depression. The subjects completed the inventory last.

Procedure

Data from the demographic question page and the Beck inventory were

scored and entered into the Statistical Analysis System (SAS Institute, Inc., 1990) for analysis. Total scores from the Beck inventory were differentiated using the cut-off scores recommended by Beck and Beamesderfer (1974). They are mild-moderate depression 10-18, moderate-severe depression 19-29, and scores over 30 indicate an extremely severe depression. Of the subjects completing the Beck inventory, the following distribution was obtained: 181 No depression, 61 Mild-moderate/depression, 5 Moderate-severe depression, and 7 Severe depression. As insufficient numbers of subjects were in the Moderate-severe and Severe depression categories, only two categories (No depression and Depression) were used. All subjects scoring 10 or more were placed in the Depression category.

RESULTS

Chi-squared analysis was conducted to assess whether the order of color presentation interacted with color selection based on the 10 questions asked of subjects. The results were not significant.

The order of color presentation and scores on depression, subjected to analysis of variance, indicated that order was not related to scores on the Beck Depression Inventory ($F_{1,6} = 0.65$, $p < .69$). It appears plausible to rule out order of color presentation in other analysis.

Of the ten questions involving choice of color, three were significantly related to depression. These questions were 1, 5, and 10. Question 1 requested information involving color and current mood. Color choice was significantly related to scores on depression ($F_{6,247} = 5.23$, $p < .01$). Individuals who chose black tended to have scores over 10 on Beck's inventory, which placed them in the Depression category. Those individuals who chose other colors had scores lower than 19 for clinical depression. When questions were asked about a favorite color in Question 5, similar results were found ($F_{6,247} = 4.52$, $p < .01$).

In choosing colors which best represent them, subjects scoring above 10 tended to chose black or brown while those individuals scoring lower chose one of the other colors ($F_{6,247} = 2.98$, $p < .008$). Black and brown were the darkest of the seven color choices.

Further analysis was conducted using chi-squared tests to investigate the relationship between gender and color choice. When asked "Which color makes you feel the least comfortable?" (Question 4), males and females showed different patterns [$\chi_6^2(N = 254) = 17.96$, $p < .006$]. Significantly more women ($n = 61$, 33.7%) reported that brown made them feel the least comfortable compared to men ($n = 15$, 20.6%). More men ($n = 12$) than women ($n = 12$, 16.4%) reported that yellow made them feel least comfortable. A similar proportion of men and women rated black as the color ($n = 8$, 4.4%) which made them feel least comfortable. No significant gender difference was found when other colors were considered.

TABLE 2
MEAN RATINGS ON THE BECK DEPRESSION INVENTORY INDICATING
RELATIONSHIPS BETWEEN DEPRESSION AND COLOR

Color	Question 1			Question 5			Question 10		
	<i>n</i>	<i>M</i>	<i>SD</i>	<i>n</i>	<i>M</i>	<i>SD</i>	<i>n</i>	<i>M</i>	<i>SD</i>
Black	12	16.8	10.6	12	14.4	9.9	9	12.1	8.7
Blue	56	6.6	6.4	115	7.7	7.4	80	8.9	8.3
Brown	30	9.9	7.9	3	5.7	3.1	4	19.0	9.1
Green	51	9.0	8.1	62	8.0	6.5	53	6.4	4.5
Red	32	7.7	6.4	42	7.5	6.9	41	7.1	6.2
White	14	8.9	7.2	7	5.3	4.2	16	9.4	7.2
Yellow	58	5.5	4.9	12	8.4	9.0	50	6.8	7.5

Color preference for classrooms (Question 6) was related to gender [$\chi_6^2(N=254)=15.78, p<.02$]. Blue or white was chosen by both genders (men and women). Differences were found for green as a classroom color. Only 19 women (10.5%) liked this color for classrooms, while 16 men (21.9%) favored it.

When asked which of the colors would be worn to feel the most attractive (Question 7), gender was also significantly related to choice [$\chi_6^2(N=254)=30.07, p<.0001$]. More men ($n=31, 42.5\%$) chose blue than did women ($n=39, 21.6\%$). Red was chosen more often by women ($n=60, 33.2\%$) than men ($n=7, 9.6\%$).

The color rated as best reflecting a feeling of happiness (Question 8) was also significantly related to gender [$\chi_6^2(N=254)=12.44, p<.01$]. Over half of the women ($n=104, 57.5\%$) chose yellow while only 38.36% of the men ($n=28$) selected this color. A higher proportion of men preferred blue ($n=21, 28.77\%$) than women ($n=29, 16.0\%$). No subject regarded black as indicating a feeling of happiness.

Race (229 Caucasians and 25 African Americans) and color selection was also investigated using chi squared. Question 1, which involved describing the color which best represented the subjects' current mood, was significant [$\chi_6^2(N=254)=17.52, p<.008$]. African-American subjects ($n=4, 16.0\%$) chose black while 3.5% of Caucasian subjects ($n=8$) made the same choice. Green was chosen by Caucasian subjects ($n=50, 21.8\%$), while only one (4.00%) African American chose this color.

Question 7, "Which color makes you feel the most attractive when worn?", was answered differently by the two racial groups [$\chi_6^2(N=254)=18.51, p<.005$]. Forty-four percent of African Americans ($n=11$) chose black, whereas 39 (17.0%) Caucasians ($n=39$) chose this color. Color preferences by Caucasian subjects were distributed among all seven colors.

Question 8, "What color makes you feel happy?", was answered differently by the two racial groups [$\chi_6^2(N=254)=10.12, p<.04$]. No subjects

from either group chose black or brown. African-American ($n=12$, 48.0%) and Caucasian ($n=12$, 52.4%) subjects were similar in their choices of yellow. Racial differences were found in their choices of red and blue, with 6 African-American subjects (24.0%) choosing red versus 33 Caucasians (14.41%). Blue was chosen by more Caucasian subjects ($n=47$, 20.52%) than African-American subjects ($n=3$, 12.00%).

DISCUSSION

Analysis indicated a relationship between scores on the Beck Depression Inventory and color choice. Individuals who scored above 10 on the Beck inventory tended to choose dark colors to represent their mood, black or brown which were the darkest of the seven available. Color choices by subjects scoring below 10 on the Beck Depression Inventory appeared to reflect color preference rather than to represent mood. Perhaps activation of internal depressive schema may have motivated the choice of colors most closely reflecting popular conceptions of the representation of mood with color.

Some gender differences in color choice were also found. These differences may reflect environmental training. Men may be encouraged to select and wear darker and more subdued colors than women.

More African Americans chose black as a more attractive color than Caucasian subjects. This selection might reflect the successful effort to raise self-esteem in this minority by such slogans as "Black is beautiful," "Black Pride," and "Black Power."

Of the seven colors presented, blue and red were the least objectionable and were often favorites. By using these colors in classrooms at least on one wall or as an accent to a neutral color, a positive schema might be activated. The application of a color may positively influence outcomes in many situations.

REFERENCES

- BECK, A. T. (1961) A systematic investigation of depression. *Comprehensive Psychiatry*, 2, 163-170.
- BECK, A. T. (1967) *Depression: clinical, experimental, and theoretical aspects*. New York: Harper & Row.
- BECK, A. T., & BEAMESDERFER, A. (1974) Assessment of depression: The Depression Inventory. In P. Pichot (Ed.), *Modern problems in pharmacopsychiatry*. Basel, Switzerland: Karger. Pp. 15-169.
- BECK, A. T., & HURVICH, M. S. (1959) Psychological correlates of depression: frequency of "masochistic" dream content in a private practice sample. *Psychosomatic Medicine*, 21, 50-55.
- BECK, A. T., & WARD, C. H. (1961) Dreams of depressed patients: characteristic themes in manifest content. *Archives of General Psychiatry*, 4, 55-63.
- DERRY, P. A., & KUIPER, K. A. (1981) Schematic processing and self-reference in clinical depression. *Journal of Abnormal Psychology*, 90, 286-297.
- GOTLIB, I. H. (1983) Perception and recall of interpersonal feedback: negative bias in depression. *Cognitive Therapy and Research*, 7, 399-412.

- GOTLIB, I. H., & McCANN, C. D. (1984) Construct accessibility and depression: an examination of cognitive and affective factors. *Journal of Personality and Social Psychology*, 47, 427-439.
- KOVACS, M., & BECK, A. T. (1978) Maladaptive cognitive structures in depression. *American Journal of Psychiatry*, 135, 525-533.
- SAS INSTITUTE, INC. (1990) *SAS/STAT user's guide version 6*. (4th ed.) Cary, NC: SAS Institute, Inc.
- SPROCK, J., BRAFF, D. L., SACCUZZO, D. P., & ATKINSON, J. H. (1983) The relationship of depression and thought disorder in pain patients. *British Journal of Medical Psychology*, 56, 351-360.
- WILLIAMS, J. M., & NULTY, D. D. (1986) Construct accessibility, depression and the emotional Stroop task: transient mood or stable structure? *Personality and Individual Differences*, 7, 485-491.

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