

INFLUENCE OF COLOR IN THE ENVIRONMENT ON PERCEIVED FRAGRANCE QUALITIES

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ABSTRACT

A study was conducted to measure the effect on perceived fragrance qualities of various colors in the environment. Panels of women consumers were individually exposed to the stimulus material and were asked to characterize the nature of the fragrances. The results showed significant variation in fragrance qualities as a function of color; the implications of these findings in marketing and for future research are discussed.

INTRODUCTION

For many years our organization has maintained an interest in synesthesia: the mixing of sensory stimuli and response. The effect of sound on color perception, the effect of color on food flavors and the effect of package design on product acceptance have been measured—all with a view toward enhancing product performance in the market place. Experience in working with advertising agencies, industrial designers and consumer product manufacturers has revealed that too often, basic psychophysiological phenomena have been neglected, and maximum product performance is not achieved.

This present study illustrates the importance of color on perceived fragrance qualities and on fragrance advertising.

An earlier paper from this organization (1) revealed a clear-cut pattern of color associations with certain well-known fragrances; the present work evolved from that earlier study. Specifically, the earlier investigation revealed that a fragrance could evoke a reliable pattern of color response. The present study was designed to determine whether or not color could

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have a facilitating effect on fragrance perception—that is, whether certain colors could bring to mind certain fragrance qualities or influence those qualities objectively perceived.

PROCEDURE

The program was divided into two phases. The first phase was concerned with the effect of color on the perceived qualities of two well-known perfumes—Chanel No. 5^{®*} and Tabu.^{®**} These fragrances were selected virtually at random from the wide variety of popular perfumes on the market. They were not intended to represent any particular segment of the fragrance spectrum and were chosen solely as test stimuli. Their individual qualities were considered less important than the effect on them of the environmental influences which were to be assessed.

Each of these perfumes was individually evaluated and rated by panels of women consumers. The stimulus colors were associated with the fragrances by presenting the perfumes on blotting strips which could be one of four colors—white, blue, yellow or magenta. An individual respondent evaluated only a single perfume in conjunction with a single color. She was not aware of the true purpose of the test—namely, that the color variable was being studied; neither was she aware of the identity of the perfume she was evaluating. She was asked to smell the fragrance and to rate it on a bi-polar scale for each of four qualities—*sweetness*, *sharpness*, *sensuality* and *expensiveness*. On each scale, the respondent was asked to place a check mark at any point along the line to indicate her judgment of the fragrance in question. By measuring the distance between her check mark and the beginning of the scale, her judgment was translated into a numerical score between 0 and 100.

Separate panels of 400 women were tested on each fragrance; these were further subdivided into groups of 100 women who rated the fragrance in conjunction with each of the four colors. These interviews were conducted in the New York and Chicago Public Opinion Testing Stations of the United States Testing Company. At these facilities, passersby are invited to participate in a variety of consumer product tests and market research studies.

RESULTS

The results of the first phase are summarized in Table I. This presents the mean ratings given to Chanel and Tabu when evaluated on blotting

* Registered Trademark, Chanel, Inc.

** Registered Trademark, Dana Perfumes Corp.

TABLE I—REACTION TO FRAGRANCE WHEN ASSOCIATED WITH COLOR

	Mean Ratings for			
	Sweet	Sharp	Sensual	Expensive
<i>Chanel No. 5</i>				
Associated with				
White	43	66	44	71
Blue	41	68	31	66
Yellow	58	76	50	77
Magenta	60	53	58	60
<i>Tabu</i>				
Associated with				
White	73	45	70	68
Blue	58	58	74	63
Yellow	79	54	75	78
Magenta	77	45	76	48
Least significance difference (2)	8.3	6.0	8.4	7.2

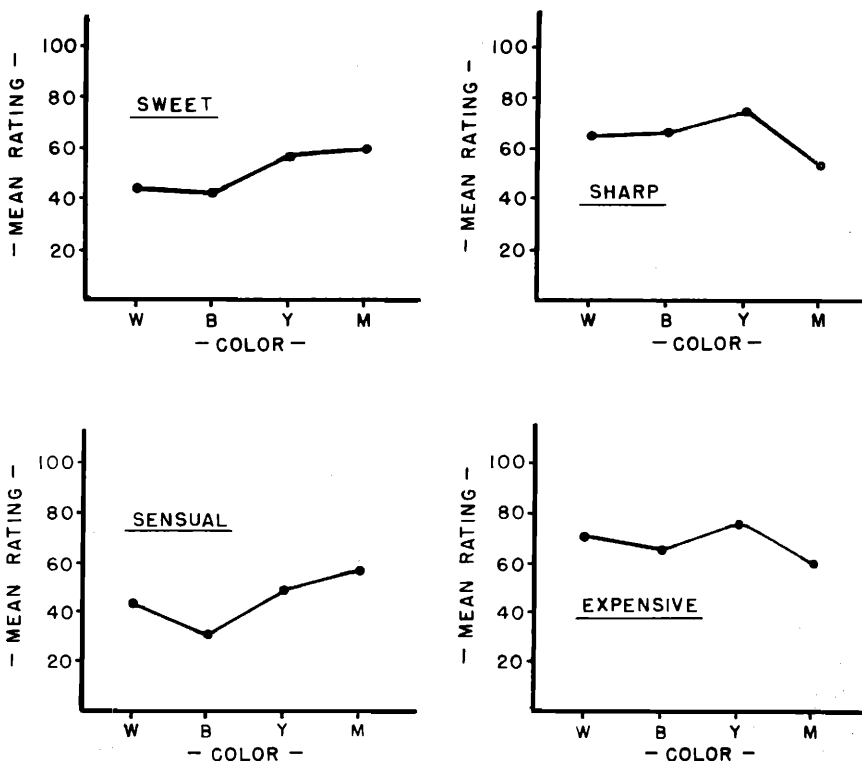


Figure 1.—Reaction to Chanel No. 5 fragrance when associated with color. (The response to a color is a discrete variable; the points on the curves are connected only to assist the eye in following the change in response.)

strips of each of the four colors. Each numerical value is the mean of 100 women's ratings. The ratings for sweetness are shown in the first column, the ratings for sharpness in the second column, followed by the sensuality and expensiveness ratings. The "white" data represent the ratings given to Chanel and Tabu without the influence of color. Tabu was judged considerably sweeter, less sharp and more sensual than Chanel; the two perfumes were judged about equal in expensiveness, however.

The figures for blue, yellow and magenta show the influence on these ratings of the introduction of color. Taking the sweetness column as an example, it is apparent that Chanel's sweetness rating was not significantly affected by association with blue. Both yellow and magenta, however, raised Chanel's sweetness rating by 15 to 17 points—that is, Chanel was perceived as much sweeter when evaluated on the yellow and magenta blotting strips. For Tabu, on the other hand, the most influential color was blue, which *lowered* Tabu's sweetness rating by 15 points. Yellow and magenta enhanced its perceived sweetness as they did for Chanel but to a lesser extent.

By examination of the same data for Chanel in graphic form (Fig. 1), the influence of color on perceived fragrance qualities can, perhaps, be seen more clearly.

Of the four qualities investigated, the one most vulnerable to the influence of color (i.e., showing the greatest range of responses) was perceived sensuality, but each of the other three qualities also exhibited considerable variation as a function of color.

The Tabu data (Fig. 2), by contrast, reveal little or no change in perceived sensuality as a function of color. Here, the greatest shift was in the expensiveness ratings, which dropped 30 points from the "most expensive" color—yellow—to the "least expensive"—magenta.

In the second phase of the study, the influence of color on perceived fragrance qualities was investigated *in the absence of the fragrance itself*. The stimulus used to evoke fragrance qualities was an advertisement for the perfume in question. While looking at the ad, respondents rated the perfume on the same four rating scales as were used in phase I. Again, the respondents were divided into four groups. One group made its ratings from the original black-and-white ad; the other groups saw blue, yellow or magenta ads. To prepare these materials, a Chanel No. 5 ad and a Tabu ad were photographically tinted and reproduced in white and in each of the three test colors.

Separate panels of 100 women made their fragrance quality ratings for each of the eight stimulus-advertisements.

The results of the second phase are summarized in Table II. This presents the mean ratings given to Chanel and Tabu in the presence of the four differently tinted ads. Again, the ratings for sweetness are given

TABLE II—REACTION TO ADVERTISING WHEN ASSOCIATED WITH COLOR

	Mean Ratings For			
	Sweet	Sharp	Sensual	Expensive
<i>Chanel No. 5</i>				
Associated with				
White	19	42	15	88
Blue	10	53	17	86
Yellow	64	70	36	75
Magenta	57	51	52	59
<i>Tabu</i>				
Associated with				
White	56	33	82	75
Blue	50	51	80	79
Yellow	71	51	88	60
Magenta	77	44	94	68
Least significant difference (2)	5.8	7.6	6.0	7.5

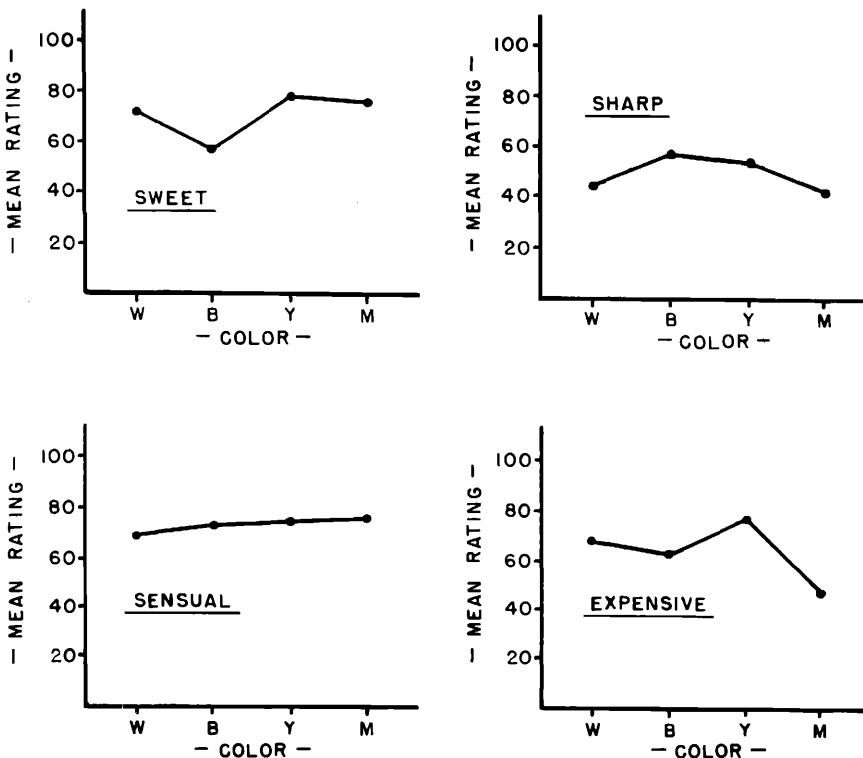


Figure 2.—Reaction to Tabu fragrance when associated with color. (The response to a color is a discrete variable; the points on the curves are connected only to assist the eye in following the change in response.)

in the first column, followed by the ratings for sharpness, sensuality and expensiveness.

In considering these data, it must be remembered that the respondents were rating their image of the fragrance of the perfume as evoked by the ad, not the perfumes themselves.

As in the actual fragrance evaluations, Tabu was thought to be sweeter and more sensual than Chanel on the basis of the white data. In this

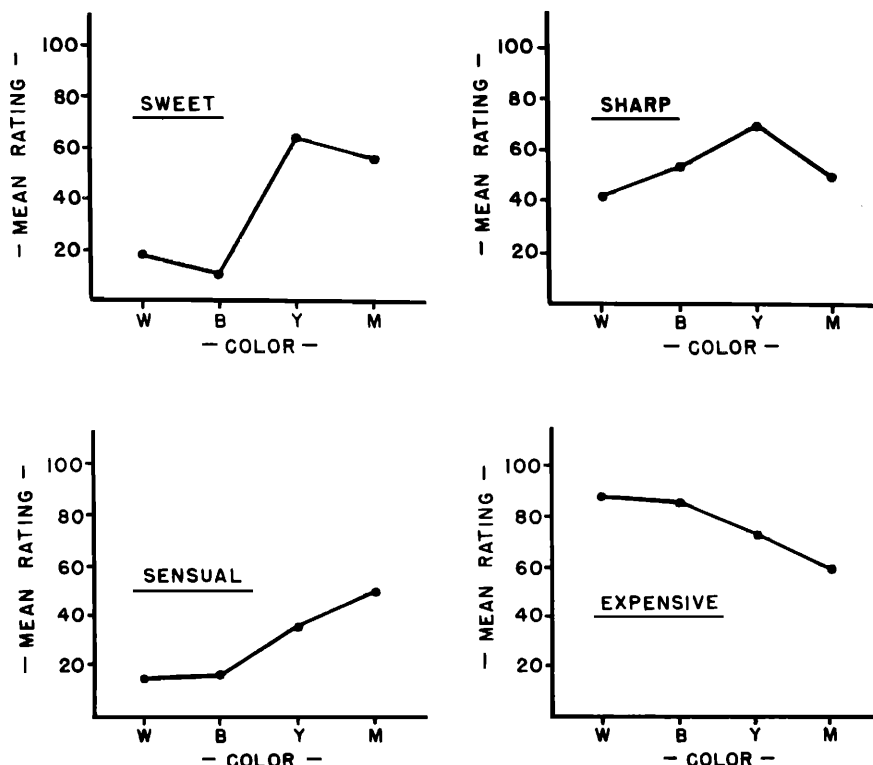


Figure 3.—Reaction to advertising of Chanel No. 5 when associated with color. (The response to a color is a discrete variable; the points on the curves are connected only to assist the eye in following the change in response.)

phase, the margin of difference between Tabu and Chanel was considerably greater than in the previous phase.

Turning now to the influence of ad color on perception of the perfumes, it can be seen that Chanel's rating for sensuality was very low in response to both the black-and-white and the blue ads. Tinting the ad yellow raised Chanel's sensuality rating by 21 points, and tinting it magenta raised it even further—37 points. The Tabu ad evoked very high sensuality ratings even in black-and-white, so that even tinting it magenta could only raise its perceived sensuality by 12 points.

The graphic presentation of the Chanel data shows at a glance that all four of the perceived fragrance qualities were rather strongly influenced by ad color, most strikingly so in the case of sweetness (Fig. 3).

The data on apparent expensiveness are also interesting, in that the black-and-white Chanel ad yielded the highest expensiveness rating, closely

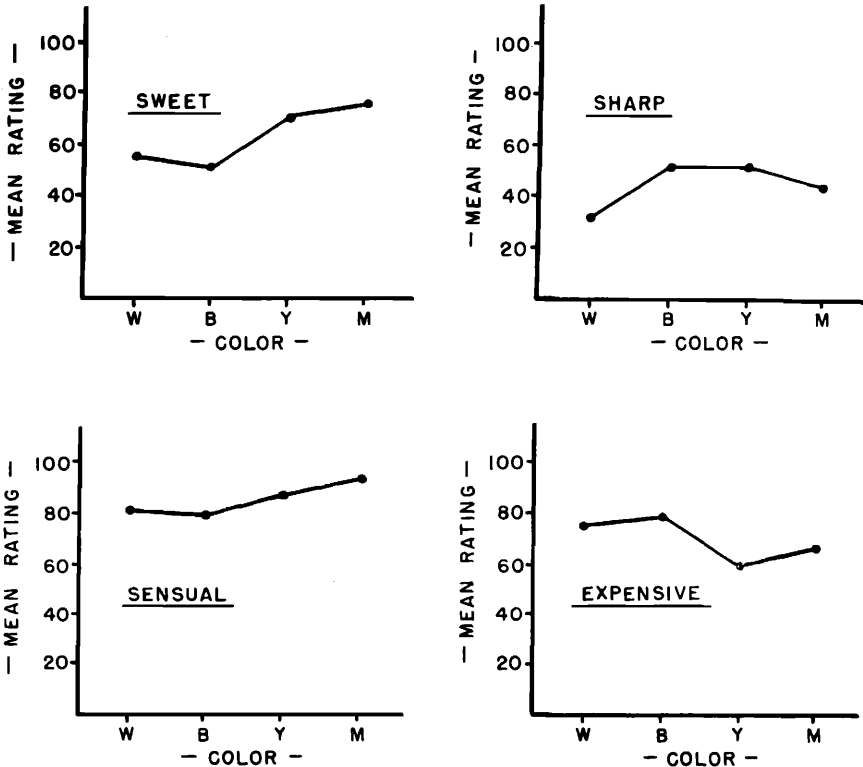


Figure 4.—Reaction to advertising of Tabu when associated with color. (The response to a color is a discrete variable; the points on the curves are connected only to assist the eye in following the change in response.)

followed by the blue ad. The yellow and, especially, the magenta ad were associated with a significantly less expensive fragrance.

Response to the Tabu ad (Fig. 4) did not show as much fluctuation with color as did response to the Chanel ad. Nevertheless, significant effects did emerge in the ratings for sweetness, sharpness and expensiveness. In the case of sharpness, for example, all three tinted ads increased the perceived sharpness of the perfume as compared with the black-and-white ad.

SUMMARY AND CONCLUSIONS

In summarizing the results of this fragrance/color interaction study, it is concluded that color in the environment has a strong influence on perceived fragrance qualities. This study did not attempt to explore the full range of colors nor cover the many classes of fragrance available to a consumer. Instead, the work illustrates some of the implications and the importance of the use of color in conjunction with fragrance marketing. Similar data have been compiled by our organization for foods, beverages and appliances, and it has been found that marketing effectiveness has been based on sound consumer research.

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- (2) C. W. Dunnnett, *J. Am. Stat. Assoc.*, 50, 1096 (1955).