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Antipollution Measures and Psychological Reactance Theory: A Field Experiment

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A field experiment was conducted to determine if hypotheses derived from psychological reactance theory could explain response to the implementation of an antiphosphate ordinance. Deprived housewives expressed more positive attitudes toward the eliminated alternative than did control subjects thereby supporting reactance theory predictions. Within the experimental group, subjects were divided into two groups based on their degree of choice deprivation. As predicted, subjects forced to switch from their preferred detergent brand expressed less favorable attitudes about the effectiveness of no-phosphate versus phosphate detergent than subjects who could maintain brand continuity. Reduced attractiveness of forced alternative rather than enhancement of forbidden alternative was the principal mode of response resulting from psychological reactance.

Psychological reactance theory asserts that when a person believes himself free to engage in a given behavior and his freedom is eliminated or threatened with elimination, the individual experiences psychological reactance, a motivational state directed toward reestablishment of the threatened or eliminated freedom (Brehm, 1966). One major determinant of reactance, external pressure applied through social influence or persuasive communications, has been studied extensively. Laboratory experiments have typically manipulated social influence by having confederates restrict subjects' freedom of choice through freedom threatening statements (Brehm & Sensenig, 1966; Worchel & Brehm, 1971).

Recent research exploring the influence of persuasive communications has focused on factors attenuating reactance effects. Conformity pressures (Grabitz-Gniech, 1971; Pallack & Heller, 1971), the involvement of peers in eliminating alternatives (Worchel & Brehm, 1971), and individual difference variables, including manipulated felt competence (Wicklund & Brehm, 1968), feelings of inadequacy (Grabitz-Gniech, 1971), and locus of control (Biondo & MacDonald, 1971) have been found to influence reactivity.

While the loss of options may be a major determinant of psychological reactance also, it has not been fully explored in reactance research. Grabitz-Gniech (1971) and Brehm, Stires, Sensenig, and Shaban (1966) examined the effect of reducing the choice of records and paintings, respectively, among college students in laboratory experiments. While statistically significant reactance effects were found, both experiments failed to present an ego-involving situation in which subjects lost an important freedom. The possibility of demand characteristics producing a reactive response must be considered. Perhaps a more appropriate laboratory for experimentation is the marketplace where consumers' freedom of choice has been frequently restricted through governmental action such as requiring safety devices on automobiles; recalling soups, cranberries, tuna, drugs, and automobiles; and restricting the use of energy. Unfortunately, the only field study (Weiner & Brehm, 1966) examining reactance effects was debilitated by the failure to apply unobtrusive pressure to subjects, thereby negating a major advantage of field experimentation.

The elimination of free choice by authority sources has been explored in reactance research, but the only authority source studied

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has been the psychological experimenter (Hammock & Brehm, 1966). For research involving authority sources to have generalizability, particularly for social issues, a wider sampling of authority sources is needed. For example, Davis and Eichhorn (1963) have studied the issue of compliance and noncompliance with physicians' regimens. The current experiment is directed toward determining if responses to the imposition of a "socially beneficial" governmental action (antiphosphate ordinance) might be predicted from psychological reactance theory.

Obviously, not all individuals react against all restrictions of free choice. It remains for research to specify which subjects and under which restrictions psychological reactance is manifested when options are eliminated or curtailed by authority sources.

The principal consequence of reactivity needs to be specified more precisely also. The present study explores two major manifestations of reactivity, enhanced attractiveness of restricted alternatives and reduced desirability of alternatives forced upon subjects. Most reactance studies have failed to separate these two effects.

The present investigation concerns response to an event affecting many households throughout the United States—imposition of an antiphosphate law. On Jaunary 1, 1972, Dade County (Miami), Florida, began prohibiting the sale, possession, or use of laundry detergents and other cleaning products containing phosphates. Since only a small number of popular brands were available in no-phosphate formulations, shoppers found their choice of laundry detergent drastically diminished. These dramatic changes in the number of choice alternatives provided an opportunity to examine psychological reactance theory predictions in a field setting.

According to reactance theory, Miami households would be motivationally aroused due to the phosphate restrictions and feel an increased desire to have the forbidden detergent as contrasted with households in a control city (Tampa) whose freedom of choice was unrestricted. The reactance aroused in Miami subjects should result in higher effectiveness attributed to phosphate detergents as compared with Tampa subjects and more negative attitudes toward governmental regulation of environmental matters which should influence the product evaluations of Miami consumers.

Since Miami households could be classified into three major subgroups, additional reactance theory predictions may be made. The first group consisted of housewives who were able to continue purchasing products labeled by their favorite brand names, but which were now being sold without phosphates; these households are referred to as "nonswitchers." Since one leading detergent manufacturer quickly began distributing no-phosphate reformulations of all its existing laundry detergent brands, users could continue to purchase their regular brands after the antiphosphate law went into effect.

Several other detergent manufacturers did not begin distribution of no-phosphate reformulations for several months and therefore users were forced to switch brands after the phosphate restrictions went into effect. These consumers, who were forced to switch from their regular brands, are referred to as "switchers."

Based on their dissimilar motivational states, it is anticipated that (a) switchers would express more negative attitudes about the effectiveness of no-phosphate products and/or more positive attitudes about the effectiveness of phosphate products than would nonswitchers and (b) switchers would have a more negative attitude toward the antiphosphate law than would nonswitchers.

Switchers should feel a greater restriction of their freedom of choice than should nonswitchers as a result of being unable to purchase a laundry detergent sold under their favorite brand label. It must be remembered that both switchers and nonswitchers were using a totally new product; however, in one case consumers were using a product with a "new" label or brand name, while in the other they were able to use a reformulated product being sold under their favorite brand name.

The third group of Miami households are those who defied the antiphosphate ordinance by smuggling detergent into Miami from surrounding counties or who accummulated large amounts of phosphate detergent before the January enforcement date. Since these smug-

TABLE 1

MEANS AND STANDARD DEVIATIONS FOR EFFECTIVENESS RATINGS OF PHOSPHATE DETERGENTS

Characteristic	Miami (n = 76)		Tampa (n = 45)	
	M	*SD*	*M*	*SD*
Whiteness	8.68	1.87	8.27	1.56
Freshness	8.77	2.08	7.87	1.51
Cleans in cold water	8.52	2.15	7.47	1.83
Brightness	8.31	2.09	7.84	1.80
Stain removal	8.00	2.43	6.96	2.05
Pours easily	9.45	2.05	9.07	1.77
Gentleness	8.81	1.80	8.71	1.51

Note. Based on an 11-point scale with 11 labeled "absolutely perfect" and 1 labeled "poor."

glers and hoarders may have had very favorable attitudes toward phosphate detergents before the enactment of the no-phosphate restrictions, no predictions can be made concerning their attitudes about the effectiveness of phosphate brands based on reactance theory. Their predisposition toward phosphate brands may have been instrumental in their being categorized as "violators." On the other hand, switchers and nonswitchers were placed into those categories as a result of detergent manufacturers' decisions about whether to produce no-phosphate reformulations of detergent brands.[1]

METHOD

An instrument was designed to determine attitudes about laundry detergents and related products, opinions about laws regulating the use of phosphates, and demographic characteristics. Seventy-six interviews were completed by four female interviewers in Miami and 45 completed questionnaires were returned by the two female interviewers in Tampa. Nine questionnaires were discarded as a result of incomplete responses. Interviews were conducted from a period from 7 to 9 weeks after the antiphosphate statute became effective.

Since only limited funding was available to defer the cost of interviewing, sample selection in both Tampa and Miami emphasized subject homogeneity to restrict the impact of extraneous variables. To enhance the similarity between Tampa and Miami samples, all respondents interviewed were: (a) English-speaking Caucasian women; (b) with family incomes of $7,500 to $15,000 per year; (c) who had at least one child under 16 years of age living at home; (d) who resided in single-family dwellings; and (e) who used primarily phosphate detergent brands during the preceeding 6 months. Comparisons between Tampa and Miami samples revealed no significant income, age, or educational differences.

Two middle-income census tracts were chosen in both cities and blocks were randomly selected within tracts. Two sampling points were randomly designated within each block and interviewing commenced from each point in a clockwise direction until two respondents were found who met the criteria enumerated above.

RESULTS

Miami versus Tampa

At the beginning of each interview, subjects were asked to rate the effectiveness of the phosphate laundry detergent they had used most during the previous 6 months. Seven brand characteristics were evaluated on an 11-point scale labeled "absolutely perfect" and "poor" at the end points. Salient characteristics were determined through a free association procedure similar to that used by Fishbein (1967).

Reactance theory predictions are supported by the data in Tables 1 and 2. On all seven characteristics, Miami subjects gave higher mean effectiveness ratings to phosphate brands than did Tampa subjects.

The two way Groups × Trials analysis of variance (Veldman, 1967, pp. 247–257) in Table 2 provides statistical support for the proposition that Miami housewives were in a reactive motivational state. Overall, Miami subjects rated phosphate detergents as being more efficacious than did Tampa subjects ($F = 5.42$, $p < .05$).

The significant interaction between cities and characteristics ($F = 2.27$, $p < .05$) shows that the reactivity of Miami housewives was not manifested uniformly across all character-

TABLE 2

ANALYSIS OF VARIANCE FOR EFFECTIVENESS RATINGS OF PHOSPHATE DETERGENTS

Source	*MS*	*F*
Groups: Miami vs. Tampa	77.74	5.42*
Error (Groups)	14.34	
Trials: Characteristics	35.06	20.07**
Groups × Trials	3.97	2.27*
Error (Trials)	1.75	

* $p < .05$.
** $p < .001$.

[1] No subjects classified as nonswitchers switched to another manufacturer's brand after enactment of the antiphosphate ordinance.

TABLE 3

ATTITUDE TOWARD GOVERNMENT AND ANTIPHOSPHATE LAWS

Variable	Miami		Tampa		t
	M	SD	M	SD	
The government should play an important role in protecting our water from pollution.	2.39	.90	1.64	1.20	3.62*
Legal restrictions should be imposed against the sale of detergents containing phosphates.	2.76	.93	2.20	1.17	2.72*

Note. Responses on Likert-type scale with "1" indicating strong agreement and "5" indicating strong disagreement.
* $p < .01$.

istics. Also, there was a significant main effect for characteristics indicating that subjects did discriminate among various detergent attributes by not rating detergent brands as being equally effective on all characteristics ($F = 20.07$, $p < .001$).

Miami subjects expressed a less optimistic view about the success of governmental action in solving water pollution problems and toward the usefulness of phosphate content regulation than did Tampa subjects (see Table 3).

Tampa residents stated a stronger degree of agreement with the statement, "The government should play an important role in protecting our water from pollution," than did Miami subjects ($t = 3.62$, $p < .01$). In addition, Tampa housewives had greater expectations about the usefulness of laws restricting the sale of detergents containing phosphates than did Miami respondents ($t = 2.72$, $p < .01$), thereby sustaining the view that Miami housewives were experiencing psychological reactance.

Switchers versus Nonswitchers

Brand ratings. According to psychological reactance theory, the amount of freedom eliminated directly influences psychological reactance. Since switchers were experiencing more psychological choice deprivation, they should provide lower mean effectiveness ratings to no-phosphate brands than should nonswitchers.

The data in Table 4 shows that of the 76 Miami households responding (9 of which had incomplete data), the 44 switchers provided lower average effectiveness ratings across all seven detergent attributes than did the 23 nonswitchers. The Groups × Trials analysis of variance in Table 5 reveals significantly lower attractiveness estimates for no-phosphate products by switchers than by nonswitchers ($F = 4.48$, $p < .05$).

The greater degree of psychological reactance being experienced by switchers may take the form of increased attractiveness of the restricted alternative (phosphate detergent), as well as decreased attractiveness of the alternative forced upon subjects (no-phosphate detergent). Similar ratings of phosphate detergent effectiveness between Tampa and Miami subjects are shown in the middle sections of Tables 4 and 5 ($F = .00$, $p <$

TABLE 4

MEANS AND STANDARD DEVIATIONS FOR EFFECTIVENESS RATINGS OF DETERGENTS

Characteristic	No-phosphate detergents				Phosphate detergents				Difference scores			
	Switchers		Nonswitchers		Switchers		Nonswitchers		Switchers		Nonswitchers	
	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
Whiteness	7.07	1.60	7.87	1.72	8.59	1.63	8.61	1.51	1.52	.79	.74	1.70
Freshness	7.11	1.70	7.85	1.85	8.75	1.61	8.78	1.41	1.63	1.17	.91	1.88
Cleans in cold water	6.36	2.12	7.61	2.37	8.72	1.93	8.43	1.42	2.36	1.43	.83	2.43
Brightness	6.30	2.00	7.43	2.13	8.41	1.78	8.17	1.61	2.27	1.51	.74	2.26
Stain removal	6.14	2.53	7.41	1.96	7.79	2.00	8.13	1.95	1.66	1.27	.70	2.01
Pours easily	8.45	2.01	9.17	2.37	9.30	1.41	9.78	1.89	.84	1.05	.61	1.62
Gentleness	7.23	1.92	8.04	2.08	8.93	1.70	8.74	1.21	1.70	1.23	.70	2.01

Note. Based on an 11-point scale labeled "absolutely perfect" and "poor" at end points.

TABLE 5

ANALYSIS OF VARIANCE FOR EFFECTIVENESS RATINGS OF DETERGENTS

Source	No-phosphate detergents			Phosphate detergents			Difference scores		
	df	*MS*	*F*	*df*	*MS*	*F*	*df*	*MS*	*F*
Groups: Switchers vs. nonswitchers	1	99.06	4.48*	1	.05	.00	1	99.27	7.51**
Error	65	22.09		65	12.88		65	13.21	
Trials: Characteristics	6	35.32	25.29***	6	15.33	13.92***	6	8.31	5.20***
Groups × Trials	6	.94	.67	6	1.32	1.20	6	3.22	2.02
Error	390	1.40		390	1.10		390	1.60	

* $p < .05$.
** $p < .01$.
*** $p < .001$.

.99). These nonsignificant findings are explored in the final section of this article.

In a within-subjects experimental design, the "total reactance effect" (Hammock & Brehm, 1966) can be examined by analyzing difference scores generated by subtracting each subject's rating of no-phosphate detergent from her rating of phosphate detergent for each characteristic. In this way both hypotheses derived from reactance theory (enhancement of forbidden alternative and derogation of forced alternative) can be tested simultaneously. The last sections of Tables 4 and 5 indicate that switchers felt there was a substantial difference in efficacy between phosphate and no-phosphate formulations whereas nonswitchers felt that no-phosphate brands were only slightly less effective than phosphate variations ($F = 7.51$, $p < .01$).

Attitudes toward detergent use. In addition to rating phosphate and no-phosphate detergents on seven characteristics, subjects evaluated the potency and cost of alternative formulations. As a result of being in a reactive motivational state, subjects who were forced to switch from their favorite brands would be expected to express more negative attitudes about the amount of detergent and extra ingredients required for each washload and about the cost of washing clothes when using no-phosphate detergent than would nonswitchers.

Table 6 indicates that while nearly a third of switchers felt they had been using more no-phosphate detergent, $\chi^2(2) = 9.45$, $p < .01$, and additional ingredients (e.g., bleach or fabric softener), $\chi^2(2) = 4.15$, $p < .05$, with each washload than they did with phosphate detergent, less than 10% of nonswitchers felt this was the case. There is a similar disparity about perceptions of the relative cost of using phosphate and no-phosphate products. Over 71% of switchers believed that no-phosphate brands were more expensive to use than products containing phosphates, but only 30% of nonswitchers expressed neg-

TABLE 6

ATTITUDE TOWARD DETERGENT USE

Group	Amount of detergent used[a]			Amount of extra ingredients used[b]		Cost of no-phosphate detergent[c]	
	More	Less	Same	More	Same or Less[d]	More	Same or Less[d]
Switchers	14 (32%)	4 (10%)	26 (58%)	14 (32%)	30 (68%)	31 (71%)	13 (29%)
Nonswitchers	1 (4%)	5 (28%)	17 (68%)	2 (8%)	21 (92%)	7 (30%)	16 (70%)

[a] $\chi^2(2) = 9.45$, $p < .01$.
[b] $\chi^2(1) = 4.15$, $p < .05$.
[c] $\chi^2(1) = 9.58$, $p < .001$.
[d] Categories combined to provide sufficient expected value per cell.

ative feelings about the cost of using their reformulated no-phosphate brands, χ^2 (1) = 9.58, $p < .001$.

DISCUSSION

While student subjects in laboratory experiments have often behaved as predicted by psychological reactance theory, the current study provides strong support for the theory's predictions among housewives in a field setting. As predicted, Miami subjects rated phosphate detergents as being more effective than did Tampa subjects. Hypotheses derived from psychological reactance theory concerning Miami versus Tampa subjects' attitudes toward government's role in protecting the public from water pollution and in imposing legal restrictions against the sale of products containing phosphates were sustained as well.

Since adaptation effects (Helson, 1964) may have contributed to the enhanced attractiveness of phosphate detergent as a result of expanded use of the less effective no-phosphate brands, the most compelling evidence supporting a reactance theory interpretation is found in the attitudinal differences of switchers and nonswitchers. Analysis of effectiveness ratings revealed that there were no significant mean differences in the evaluation of alternative brands of no-phosphate detergent. As a result, the differential attitudes expressed by switchers and nonswitchers can be attributed to psychological reactance rather than to physical differences in the brands used.

This research does make several contributions to the psychological reactance literature. First, it demonstrates that psychological reactance is not solely a laboratory phenomena. Housewives did feel more psychological choice deprivation when they were forced to switch from their favorite phosphate brands to unfamiliar brands of no-phosphate laundry detergent.

Second, greater insight into the consequences of reactance were obtained. Negative attitudes about the effectiveness of the alternative forced upon housewives rather than enhancement of the eliminated alternative was found.

Since most subjects expressed satisfaction with their laundry detergents, psychological reactance would be less likely to take the form of increased desirability of the eliminated alternative as compared with decreased attractiveness of the forced alternative due to ceiling effects. The mean rating for control group (Tampa) subjects was 8.02 on an 11-point scale. While the circumstances surrounding this experiment may be unique, it is possible that reactance often takes the form of a reduction in the attractiveness of the forced alternative since people are satisfied with the products they use as a result of dissonance reduction. More valuable than such speculation would be further research on this topic.

Third, public policy implications of psychological reactance research have been made apparent. From a societal perspective, the most appropriate laboratory for psychological reactance research might be the consumer market. While governmental agencies and legislators issue administrative decisions and enact ordinances which restrict freedom of choice, consumer assessment after restriction is rarely undertaken. Too much restriction may result in extensive noncompliance. However, additional research is needed to assess the degree of consumer reactivity as a result of: (a) the issue, (b) the proportion of choice alternatives remaining and number of substitutes available, (c) the authority sources (e.g., federal vs. local and state government; legislative vs. executive decisions) used to eliminate freedom of choice, and (d) the permanence of a reactive motivational state.

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