In this field study the conclusion is reached that objective educational campaigns for fluoridation, which want to have the facts speak for themselves, are likely, as they generate debate, to be self-defeating. This provocative conclusion is followed by the comments of another social scientist, to which the author replies.

FLUORIDATION ATTITUDE CHANGE

John E. Mueller, Ph.D.

IN an analysis of survey data on attitudes toward the fluoridation of water supplies, A. Stafford Metz has hypothesized in passing that "undecided persons, in the event that they took a stand on the issue, as in the case of a referendum vote, would, for the most part, change to a negative position."[1] Similarly, William A. Gamson, also basing his observation on survey materials, finds that a considerable number of respondents favorable to fluoridation are very poorly informed about the measure, and thus in a referendum campaign "may well be 'educated' into the opposition."[2]

In a field study of the politics of fluoridation, conducted by the present author, it was argued on more or less intuitive grounds that the case against fluoridation is, in the political context, a more powerful one than the case in support of the measure; thus, in agreement with the suggestions of Metz and Gamson, the undecided as well as the nominal proponents are likely under campaign pressures to vote against fluoridation.[3] This, it was concluded, is largely because the antifluoridationists have merely to convince the voter that there is some doubt among health professionals about the safety of the measure. The voter, poorly informed and at best half-interested, is unlikely to be willing or able to weigh the evidence carefully or to sort through the reputations and motivations of the few health professionals hostile to fluoridation. He sees only that a debate is in progress and that some people with "M.D." or "D.D.S." after their names are concerned about possible health dangers. He is likely to conclude from the bewildering noise and banter of the campaign that, since "doctors disagree" about the dangers of fluoridation and since the benefits of the measure are rather indirect and undramatic, his best course for the moment is to oppose the measure until the experts can get together.

Accordingly, it was argued, the outcome of the election largely rests on the ability of the antifluoridationists to get their highly effective argument across, not on the ability of the proponents patiently to "educate" the public against the distortions of the opposition.

Others might argue, however, that, while the campaign may be important in determining the outcome of the election, this is not because the case against fluoridation is so convincing by itself; rather, the antifluoridationists are able to make it appear by their actions that they are engaged in a crusade against the "structure of authority" in the community and thus they garner the sympathy of the alienated, the deprived, and those unattached to the community.[4] It could

also be argued that if the two sides of the arguments are presented calmly and objectively to the voter, the "true facts" of the proponents' case are sure to be more persuasive, and that the argument against fluoridation only appears effective because it is presented in the campaign situation by "professional agitators" who skillfully cloud the issue with "big lie" tactics, frenetic activity, and "insidious propaganda."[5]

Some evidence was presented in the field study to suggest that the antifluoridation case, even when separated from the campaign itself, is more effective with the average voter than is the argument of the proponents.[6] The present study reports the results of a more thorough and systematic investigation of this proposition using experimental technics.

The Method

To test the hypothesis, three forms of a questionnaire were drawn up. On two of these forms the respondent was asked simply for his position on the question of fluoridating his city's water supply. On the other form the respondent was asked his opinion only after he had been requested to read over a lengthy list of arguments for and against the measure and to check those arguments for both sides which he felt to be most convincing. This latter request was designed to reduce the number of respondents who skipped over the arguments.[7]

The arguments used were taken from those distributed to voters by the city clerk in an actual campaign in California. The arguments presented by the antifluoridationists in this document were mild in tone, and were signed by members of the local antifluoridation committee including two men identified as physicians. *At no point in this argumentation was it maintained that fluoridation was a plot,* whether by the "structure of authority," by the Communists, by capitalist groups, by the health profession, or by federal or state public health departments. Claims about ill effects were kept conditional and cautious.[8] The profluoridation arguments were rather standard and were signed by six health professionals.

The questionnaires were interleaved and then distributed throughout Los Angeles County in October, 1964, as part of an opinion survey project conducted by members of a political science class at UCLA. Some 1,930 residents of the county were interviewed. The questionnaire was left with the respondent at the conclusion of the interview to be filled out and mailed by the respondent or any other adult member of the household. The response rate was a typically low 23 per cent. Any response biases, however, because of the random nature of the questionnaire distribution, could be expected to accrue in equal measure both to the group with the fluoridation arguments and to the one without them. In comparing the two questionnaire groups on their responses to other questionnaire items, it was found that they differ almost not at all. These items included attitudinal questions concerning politics, civil liberties, alienation, and international affairs as well as the usual demographic items.

In Table 1 the questionnaire respondents are compared to the survey respondents.[9] The questionnaire group proves to be, not unexpectedly, better educated and thus somewhat more Republican and less undecided about political preferences. It is also somewhat more heavily male due, no doubt, to the housewife bias of the doorstep interviews.

Results and Interpretation

The results of the experiment are given in Table 2. As can be seen, the hypothesis is strongly confirmed. Citizens are generally favorable to fluorida-

Table 1—Comparison of questionnaire respondents with survey respondents

	Questionnaire (N=455)	Survey (N=1930)
	Per cent	Per cent
Education		
Less than high school	14	28
High school only	24	32
More than high school	62	40
	100	100
Presidential vote		
Goldwater	38	27
Johnson	53	53
Undecided	8	20
	99	100
Senatorial vote		
Murphy (R)	44	36
Salinger (D)	44	38
Undecided	11	26
	99	100
Sex		
Male	54	48
Age		
Under 40	47	48
Church attendance		
Attend regularly	31	40

tion in the noncampaign context but, when confronted with argumentation for both sides in an objective format, there is a strong tendency for this initial predisposition to break down. The differences are significant at the 0.01 level. Thus, when the fluoridation arguments are taken out of the campaign environment and presented on their own "merits," the antifluoridation argument proves to be the more influential.

It should also be noted that, while there may be something of a regression effect in these results, there are a number of features of the experiment that tend to load the outcome *against* the result obtained. First, some people in the group with the arguments probably did not bother to read them. As noted above, an effort was made to encourage the respondents in this group to read the arguments by asking them to check on both sides those that seemed the most convincing. However, fully 51 per cent checked no arguments at all. To be sure, some of these respondents still may have read the arguments, but it seems quite likely that a fair number of them did not, and thus were uninfluenced by them.

Second, the arguments in favor of fluoridation were placed first on the questionnaire form; therefore it can be expected that some respondents, who conscientiously began to read the arguments from the beginning, tired before they reached the opposing arguments. It is noteworthy in this regard that, of those who checked arguments, 10 per cent checked favorable arguments exclusively while only 4 per cent checked opposing arguments exclusively.

Third, it is likely that the group selected by the mail questionnaire procedure was, at least in some respects, more opinionated and less readily persuadable than a more representative sample of the population would be. It was noted above, in connection with Table 1, that the questionnaire sample had made up its

Table 2—Position on fluoridation for the two questionnaire groups

	Experimental group (furnished with pro and con arguments) (N=158)	Control group (no arguments) (N=297)
	Per cent	Per cent
Would vote *in favor*	54	67
Would vote *against*	20	10
Would leave ballot blank	10	14
Other and no opinion	16	8
	100	99

mind about the coming election to a greater degree than the more representative survey sample. Other evidence is furnished in Table 3 where responses to direct questions on this point are cited. As compared to national samples asked these questions by the Survey Research Center of the University of Michigan in 1960 and 1964, the questionnaire sample proves to be far more opinionated.[10]

The experiment was replicated somewhat later using junior college students, a group presumably even more opinionated especially on the fluoridation subject. The results were in the same direction although they did not quite reach statistical significance.[11]

Conclusions

The experimental results strongly support the hypothesis that when the average voter is confronted with arguments for and against fluoridation, in an objective format without conspiratorial overtones and in a noncampaign situation, he is likely to find opposing arguments to the measure more persuasive than those in its favor.

These results help to explain the surprising success for the antifluoridation cause at the polls, and should be rather sobering to those who would seek to have the measure adopted by popular vote in their community. Objective "edu-

Table 3—Responses to opinionatedness questions

	Questionnaire sample (N=455)	SRC National samples 1964 (N=1450)	SRC National samples 1960 (N=1954)
	Per cent	Per cent	Per cent
"When you make up your mind about something is it fairly hard to argue you out of it or do you change your mind fairly easily?"			
Hard to change mind	81	70	68
Change mind fairly easily	13	26	23
Depends, don't know, NA	6	4	10
	100	100	101
"When you get into an argument do you get your own way or do you often give in?"			
Always or usually get own way	64	23	18
Often give in	22	59	61
Depends, don't know, NA	15	18	21
	101	100	100
"Some people have strong opinions about a good many things. Others are more in the middle of the road. What kind of person are you?"			
Strong opinions	60	44	44
Middle of the road	37	53	47
Depends, don't know, NA	3	3	9
	100	100	100

cational" campaigns for fluoridation that seek to let the "true facts" speak for themselves are likely, as they generate debate, to be self-defeating.

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5. See, for example, Organizing a Fluoridation Program. Delmar, N. Y.: American Association of Public Health Dentists, 1961; Metzner, Charles A. Referenda for Fluoridation. Health Ed. J. 15:168–177 (Sept.), 1957; Burns, op. cit.; and Nathan, Harriet, and Scott, Stanley. Fluoridation in California: An Unresolved Public Policy Issue. Pub. Affairs Rep. No. 7 (Oct.), 1966.
6. Mueller, op. cit., pp. 62–63.
7. There were three forms of the questionniare in order to test certain other ideas in the study. For the purposes of the fluoridation study, however, two of the forms had the same version of the question and are, of course, lumped together in the analysis.
8. The relevant section read: "POSSIBLY HARMFUL: Many physicians, dentists, and biochemists warn as to possible harm and dubious benefit. Public Health Reports show that in one out of five children fluorosis (mottling) MAY occur." Emphasis in the original.
9. For further data from the survey, see Marvick, Dwaine. "Analysis Memorandum of Findings from the Mid-October Los Angeles County Opinion Survey, 1964." Department of Political Science, University of California, Los Angeles, 1964 (ditto).
10. The Survey Research Center data were made available by the Inter-University Consortium for Political Research. Neither the Survey Research Center nor the Consortium, of course, bear any responsibility for the analyses or interpretations presented here.
11. A somewhat related experiment has been carried out by Norman Miller using two groups of high school students—one strongly favorable to fluoridation, the other strongly opposed. Members of each group were presented arguments antagonistic to their own position. Controlling for dogmatism in the subjects and under varying degrees of involvement introduced by the experimenter, it was found in all cases that proponents were far more likely to alter their position when confronted with the uncongenial arguments than were the opponents. Miller suggests that *con* subjects were perhaps simply psychologically less persuadable, a conclusion which is certainly plausible given his method for choosing subjects. He is inclined to dismiss the argument that the *pro* and *con* communications were different in persuasive strength on the rather unimpressive grounds that the communications in his experiment were comparable in "type, number, and delivery." As far as the present study is concerned, proponents were, if anything, slightly *less* persuadable than opponents judging from responses to the questions enumerated in Table 3. "Involvement and Dogmatism as Inhibitors of Attitude Change." J. Exper. Psychol. 1:121–132 (May), 1965.

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Commentary on "Fluoridation Attitude Change"

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Professor Mueller's study of the impact of exposure to pro- and antifluoridation arguments adds considerable support to the speculation of many who have witnessed the difficulties encountered by fluoridation proponents in referenda. A variety of indirect evidence has lent sustenance to this speculation, but Mueller is the first to confront the question directly. The results are likely to be discouraging for proponents of fluoridation and may even raise some doubts in their own minds. Is there some genuine merit in antifluoridation arguments which some disinterested people are able to see when presented with both sides?

Perhaps, but one can gain some perspective on these results by viewing them