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COMMUNITY ATTITUDES AND ACTION ON THE FALLOUT SHELTER ISSUE

A Case Study of Two Communities
Livermore, Calif. and Norwalk, Conn.

By

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9171 Wilshire Boulevard, Beverly Hills, California

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*Mr. Wolfson resigned from C-E-I-R on May 1, 1963, but he remained as a consultant to the project. After his resignation, Mr. Lu assumed the responsibility of coordinating various project activities until its completion.

Finally, Don Zimmerman, graduate student in Sociology at U. C. L. A. served as consultant in the formulation and analysis of attitudinal scales.

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ABSTRACT

Under Contract OCD-OS-62-102, C-E-I-R was authorized to conduct a case study of two communities, Livermore, California and Norwalk, Connecticut, which had been involved in substantial public discussion of community shelter programs and appeared to be on the verge of constructing shelters on a community-wide basis. Our primary purpose was to investigate the adoption-diffusion, social action and decision-making processes about community shelter programs. Initially, we had hoped that the communities selected for our study would successfully adopt a shelter program, thus providing us a unique opportunity to observe the development of communication strategy which may be applied in other communities in order to accelerate the adoption of shelters and other civil defense programs. Unfortunately the adoption of a shelter program never materialized in either of the two communities due to external, as well as internal, forces, and what we observed was a frustrated effort on the part of some community members to build community shelters.

The leadership structure in the shelter issue was worth noting. In both communities, those who actively promoted the shelter programs were scientists and/or engineers and they were relatively inexperienced in community leadership. There was also a notable lack of support from the key community leaders who are usually active in conventional community affairs such as Red Cross drives and hospital fund campaigns. This probably contributed significantly to the fact that the adoption of a shelter program proved to be abortive in both communities.

Probability samples of 441 and 250 were obtained from Livermore and Norwalk respectively. It was found that nearly two out of every three respondents in both samples said that they approved of their respective community shelter programs. On the other hand, only one-third of the respondents in both communities were in favor of the government encouraging individuals to build private shelters.

The response patterns of both communities to the question of the fallout shelter issue were very similar despite their geographical differences.

Based on the data from the probability samples, the possible associations between several demographic variables and the attitudes toward the shelter issue were examined. Our findings are listed below:

(1) Younger people tend to be more in favor of some type of shelter program than older age groups.

(2) Men appear to take more interest in shelter programs than do women.

(3) Attitudes on fallout shelters are independent of one's religious preference.

(4) There is no significant relationship between socio-economic level and attitudes on fallout shelters.

(5) In our samples, the respondent's education level was not associated with his attitude toward fallout shelters.

(6) Parents with children at home are more likely to take a sympathetic view of community shelter construction programs.

(7) From our data no significant relationship can be established between the "home ownership" variable and the attitudes on fallout shelters.

(8) A person who possesses some manual or technical skills is more in favor of constructing shelters.

(9) Participation in organizational activities such as being a member or holding an office does not appear to be related to a person's attitude toward the shelter issue.

Based on the information and opinion statements about the attitudinal items concerning the general problems of the cold war, an ordinal measurement scale was developed by means of the Guttman scalogram analysis. Guttman scores on these attitudinal items were then correlated with several relevant demographic variables to examine whether or not there was a statistically significant relationship. Results are as follows:

(1) It was found that men are more likely to be pessimistic about consequences of thermonuclear war.

(2) People with higher education are less likely to favor a hard-line approach when dealing with foreign antagonists and are also less likely to have a feeling of anomie.

(3) Education level is not related to the respondent's beliefs as to the utility of shelters or to his opinion about the likelihood and timing of war.

(4) The older the respondent, the more bellicose he is toward foreign antagonists and the more skeptical he is about the usefulness of shelters.

(5) The respondent with children still at home tends to place a high value on the utility of shelters.

When the interviewing at Livermore was about two-thirds over, the Cuban crisis broke. In response to this unexpected event, 199 people who

had already been interviewed were reinterviewed. As expected, substantial attitudinal changes were observed. There was an increase of 10 percent in the proportion of those supporting community, as well as private, programs.

In Livermore each respondent was asked a set of questions which was designed to measure the impact of various communication media upon the shelter issue. It was found that magazines, newspapers and "talking with people" appeared to be most significantly related to one's thinking on the shelter issue.

We experimented with several prediction models with moderate success. The primary purpose was to predict a person's attitude toward the shelter issue given his Guttman scores on certain behavioral items and his measurements of several demographic variables. We found that the following two attitudinal items, which were measured by the Guttman scale, were most useful for predicting his attitude toward fallout shelters: 1) beliefs as to consequence of thermonuclear war; 2) beliefs as to efficacy of fallout shelters for life protection. In other words, if the respondent believed that a large-scale nuclear war would not be totally annihilating and also believed in the efficacy of shelters for the protection of life in the event of such a war, he would tend to support the shelter construction programs.

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I. INTRODUCTION

A. The Mission of the Office of Civil Defense

The Office of Civil Defense of the U. S. Department of Defense has a mission which is far more complex than would appear to be the case at first glance. Its mission is considered to be twofold:

1. To keep an attack-caused degradation of the social system to a feasible minimum so that it can recover to an acceptable system state within an acceptable period.
2. To build a civil defense system that can achieve the above objective.

In order to accomplish these objectives, the Office of Civil Defense must not merely develop technical procedures which would, in the event of thermonuclear involvement of the continental United States, afford substantial, practical protection for the civilian population of the country during and after such involvement, but it must also convince responsible decision-making agencies within the country of the value of, and need for adoption of, the procedures which have been developed.

B. Relevance of Public Attitudes

Action on the part of public decision-making agencies, such as the Congress, state governments, county and local governments, ultimately depends in large degree on the state of mind of the population of the country. That is, there must be a favorable climate of opinion on the part of a substantial portion of the population of the country in order for public agencies which are responsive to public opinion to be willing to make commitments of funds and to take other steps toward the adoption of civil defense, or any other, procedures. There has been widespread talk in recent years about the extent to which public opinion has ceased to operate as an effective

influence on public agencies. In most cases, what such talk means is that certain persuasive and/or informative activities of certain public or private agencies have become dominant, or at any rate extremely significant in their impact on channels of communication and on the public. Ultimately, however, public attitude and opinion are the basis on which behavior of legislative and executive action must still rest in this country.

Consequently, OCD has, properly, begun investigations into the state of attitudes toward Civil Defense in various circumstances among the population of the United States. C-E-I-R, Inc.'s present contract with OCD is one of a number of studies concerned with this general problem.

C. C-E-I-R's Assignment

At the close of the Berlin crisis in 1961, there were many communities which had been involved in substantial public discussion of community shelter programs and most of these communities appeared to be on the verge of constructing shelters on a community-wide basis. Consequently, there was a great deal of interest on the part of those responsible for the OCD programs in the communication and social actions processes which had led to the imminent adoption of a shelter program.

Under Contract OCD-OS-62-102, C-E-I-R was authorized to conduct a case study of two such communities. The major objectives of the study were 1) to determine the key factors, messages, and group behavior which were influential in the adoption of a shelter program; 2) to study the reaction of each of the two communities to the adoption of a public shelter program; 3) to compare the basic data obtained in our study with results of other sample surveys pertaining to civil defense; and 4) to investigate the existing state of

knowledge relating to the communication processes and to evaluate its applicability to civil defense messages.

1. Communities Chosen

By August 1, 1962, we had superficially explored the experiences of such California communities as La Mirada, Burbank, Santa Monica, Livermore, and the Highlands subdivision of San Mateo and we had achieved a general understanding of the dimension of problems in community shelter planning. There appeared to be an association between that proportion of the population who were involved with the aerospace-thermonuclear-electronics subcultures of the military contracting industry and the degree of community discussion concerning a shelter system.

The statement of work specifically designated Livermore, California as one of the communities to be studied. Since budgeting limitations restricted our study to one other community, the problem arose first of finding other communities which had experienced extensive public discussion of community shelter programs.

It was soon decided that studies of two Western communities would not be nearly as useful as studies involving more widely scattered communities. While it was recognized that there would be some difficulty in generalizing about the state of mind of the population of the entire country based on sample surveys from only two communities, it was felt that under the proper circumstances one might be able to generalize about how the population of the entire country might approach the problem of community shelter systems if they became at all involved in the discussion. Furthermore, generalization might be more acceptable if the study was not limited to a single region of the United States. In view of the fact that Norwalk was the only sizable

community not in the Western part of the United States which was known to have become involved in public discussion of shelter programs, it was selected as the second community for study.

2. Emphases of this study

A crucial word in the statement of work for this study, one which is repeated several times during those few paragraphs which constitute the statement of work, is the term communication. Clearly, communication is a central issue in the process of social decision-making and attitude formation. Communication involves, inter alia, four elements: the message, the source of the message, the channel through which the message flows, and the destination of the message.

In a simple stylized situation there would be one communicator and only one channel to any destination. In a more normal situation, we might find OCD, for instance, at the center of a net of channels radiating messages out to nodes in the net which then reradiate along subnets to final destinations. These subnets are determined by the scope of the particular nodes (communications organs) such as newspapers, radio and TV stations, magazines, organizations, political subdivisions, influential people, etc. For the most part, messages which have an impact on the public will have emanated from some commercial medium of communication to the public (i.e., radio, TV, magazines or newspapers). With the exception of the local newspapers, these media usually have much broader geographic impact than on a single small city or town. Since our concern is with the process which goes on in a small city or town, it would appear most practical to consider that the content of the message, and its source, are external to the communication process which is of concern to this project; that is, it is assumed that the

content and its source are environmental parameters rather than variables. Our study then will be concentrated on the channels and the destination of the communication process.

Thus, what we are particularly interested in are such questions as the following:

1) What is (are) the opinion(s) of a particular respondent about various aspects of civil defense?
2) What has he read, seen, heard, which has affected these opinions?
3) Through what media of communication, through what organizations has he been placed in contact with the material he has heard, seen, read?
4) What are the demographic, financial and social characteristics of the respondent?
5) What other opinions or beliefs does the respondent hold, in areas which are indirectly associated with Civil Defense?
6) How are these beliefs and opinions (those mentioned in 1 and 5) related to changes in external pressure (political, social, economic) which have an impact on the entire community?

II. THE SOCIAL SYSTEMS OF LIVERMORE AND NORWALK

A. Introduction

Most studies of community life have utilized two major frames of reference, (1) the community as an ecological system, and (2) the community as a social system.[1] The first of these approaches, commonly employed by human ecologists, deals with the symbiotic and structural features of communities and how these features change in response to external conditions. Thus, there has been much research on the internal structure of communities such as the distribution of goods and services, the relations of production within a community and between communities, the consumption organization of a community, and the detailed analysis of the residential structure of communities. In addition, there has been increasing interest in the temporal problems of residential movement, i.e., the daily, weekly, seasonal, and other cyclical patterns of movement among such residentially-oriented institutions as the home, church, school, work, and so on. On the basis of such studies, inter-community comparisons can be made with respect to certain conflict issues such as school consolidation, fluoridation, and perhaps community fallout shelters.

A second way to view a community is as a social system. The assumption is made that the community is a microcosm of the larger social macrocosm, a society in miniature. A community is seen as possessing a system of stratification, a power structure, and characteristic institutions or systems (such as the economic, educational, religious, and local governmental systems) depending upon the organizational complexity of the

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[1] See Reiss [18].

community. Each of these major systems or subsystems of the community are interdependent and linked with one another in a variety of ways.

These few comments relative to the major frames of reference for the study of communities are suggestive rather than definitive in scope. They are intended to present a background for the analysis of social phenomena which relate to a community issue, in this case, community fallout shelters. Any discussion of action programs or issues in the local community must take into account community power, leadership, and the problem of change within the community. In this section, an effort will be made to characterize the two communities of Livermore and Norwalk in terms of their ecologic and social systems and, in the subsequent sections through comparative analysis, to show how they may have affected the process of decision-making with respect to the issue of community fallout shelters.

B. The Social Systems of Livermore

1. General Characteristics of Livermore

The city of Livermore, California is located in a pleasant and scenic valley, on a major highway, 43 miles from San Francisco and 32 miles from Oakland, in the same county as Oakland. It has a population of about 16,000 people according to the 1960 census. It is the site of the University of California Livermore Radiation Laboratory, the Sandia Corporation Nuclear Weapons Laboratory, and the General Electric Atomic Energy Laboratory. In addition, it is a leading producer of fine wines. There are several other industrial operations in the community but the nuclear laboratories dominate the employment character of the city.

Other agricultural enterprises, including dairying and livestock, are major economic characteristics of the surrounding area.

As the accompanying statistical data shows, the community is predominantly white and rather youthful. More than two-thirds of the housing units are occupied by the owners. The median income is rather high, about $7,500, as compared with the national average of approximately $5,700 for a typical family. The city has somewhat more school-age children and fewer persons aged 65 or over than is typical for the country as a whole. Since these data are based upon the 1960 census data, it is to be expected that certain changes are not reflected here. For example, a new subdivision was recently opened which was limited to persons 50 years or more.

Like other growing communities in California, Livermore is concerned with its tax base. The matter of increasing school taxes is one of the leading issues in the community. Furthermore, the community is anxious to attract new industry. In politics, Livermore voted Republican in the gubernatorial election of 1962 in approximately the same proportion (four to three) that the rest of the state voted Democratic.

Although Livermore is relatively close to both San Francisco and Oakland, it is still, to all appearances, somewhat rural or, at least, small-town in character. This characteristic manifests itself in a number of ways, such as in the determined attempt to maintain a self-identification separate from the overshadowing problems of metropolitanism.

A large proportion of the employed persons in the city are employed at the nuclear research laboratories. In fact, almost three-fourths of

the wage and salaried workers in the city are employees of these three laboratories. This fact has certain implications for the city. Most obviously, it has an effect on the occupational structure of the community; that is, there is a high proportion of persons with scientific and technical skills. These skills, in turn, require a relatively high educational qualification. Examination of the table showing Years of School Completed (see Table 4A-4) reveals that 77 percent of the population completed at least a high-school education. This is a strikingly high percentage when compared to the nation as a whole where the figure is somewhat less than 50 percent. The data on the number of persons that completed four or more years of college is even more striking; there were 17 percent of the total population in this category.

To complete the picture of Livermore, it is necessary to point out that in the community there are some undercurrents of hostility toward the people employed at Sandia and the Radiation Laboratory. Not all of this hostility appears to come from the so-called older residents of the community; some of it appears to come simply from a general cross-section of the population that are not connected with these laboratories. These hostile sentiments were reflected in letters to the local newspaper during the period of discussion of the property tax assessment petitions for community fallout shelters and in comments made to the interviewers during the community survey on attitudes.

Summing up the background characteristics of Livermore, it is a community that is rather youthful in terms of the average age of the residents, is composed of a well-educated population, is somewhat

conservative in politics, contains a small minority group (about five percent of the population) and has, perhaps, a dichotomy in the community between the Laboratory people and the rest of the popul tion, particularly on the issue of community fallout shelters.

2. Method of Procedure

Data on the social system of this community were obtained in several ways: from the 1960 Census of Population, from the community attitudinal survey, and by means of a social-anthropological type of study. Although this section draws heavily on all three types of data, it relies primarily on the latter type of data.

It was decided at the outset of this study that an effort would be made to obtain data on the structure of community leadership in Livermore and Norwalk. It was felt that a study involving a community issue would, perforce, have to take into account the actions or participation of the leaders of the community on this issue. Furthermore, if a group of so-called influential persons in the community could be identified and observed in terms of their participation on the issue of community fallout shelters, then some knowledge could be gained about the process of community decision-making on this matter that would be supplemental to the cross-sectional survey of the population. In addition, if these "influentials" were interviewed with the same survey instrument as the sample from the general population, then comparisons could be made on attitudes and reactions with this sample.

To accomplish these purposes, the data were gathered during trips to Livermore of varying duration, ranging from one day to a week. To aid in keeping in touch with developments in the community, particularly in

connection with the community fallout issue, a subscription was entered with the tri-weekly local newspaper.

With respect to the determination of community leadership and power, it is recognized that there is much controversy concerning the reputational approach to this matter.[2] Although there are those who believe that every community has an identifiable power clique and that this clique determines community decision-making, we do not adhere to this over-simplified and naive approach. Rather, we make the assumption that there are subsystems in the community, each with its own distinctive power structure; thus, power is circumscribed according to the system in which a person is operating, e.g., labor, banking, merchandising, etc. Furthermore, it is assumed that power is unequally distributed throughout the community and that even the ordinary citizen exercises a certain amount of power through his voting and consuming behavior, although these may be somewhat predetermined by those with more power than he. Finally, we recognize that there are several types of community leaders: "top leader" whose function is largely confined to ritual or ceremonial roles identifiable with status positions; "dominant," whose frame of reference is a particular major system of the community; "organizational," such as those powerful in one formal association; "issue," such as those leaders who emerge with reference to a specific community alignment on an issue. In short, it is assumed that community power structures vary widely in different communities from the very hierarchal to the quasi-amorphous.[3]

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[2] As examples of the protagonists of the reputational approach see [6], [7], [9], [12], [14], [15], and [19]; critical discussions of the reputational approach are to be found in [4], [17], and [22].

[3] We are indebted for this perspective to the discussion of Sanders [20].

A review of the literature on community power and decision-making indicates that communities differ a great deal in their styles of decision-making. Since one aspect of decision-making is veto power over a proposal, there are some kinds of issues that can be stopped by one type of community leader. On the other hand, there are other kinds of issues that require the participation of several types of leaders and, while their approval and tacit support is helpful, they may not desire or be able to involve their followers in the organizational job required to guarantee success.[4]

Given this background on the assumptions made with reference to community leadership and power, an attempt was made to utilize the reputational approach to obtain a set of leaders for Livermore. The underlying objective was to attempt to determine the attitudes and participation of those named as most generally influential in community affairs on the impending issue of community fallout shelter construction for the city of Livermore. No claim is made here to assert that those named by this approach constitute the exhaustive list of community leaders or necessarily all of the most influential persons in the community. Rather, we were interested in comparing the attitudes, opinions and participation on this issue of those named as influential with those of the general community as determined by our sample survey.[5] We were also concerned with the rise of issue leaders with respect to this particular matter of fallout shelters

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[4] An alternative view of concentration of power in the community was recently expressed as the ratio of managers, proprietors and officials to the employed labor force by Hawley [11].

[5] For a recent major contribution of the theoretical concept of influence in the field of opinion and attitude study, see Parsons [16]. Also see comments on this paper by Coleman [3] and Bauer [1].

and how these people interacted with the influentials and others as the community fallout shelter issue proceeded to a community decision. One question of interest was: Were those people who were named as generally influential actually influential on this issue? Finally, we were interested in characterizing the community in terms of the stratification system and other organizational attributes (using them as independent variables) and in analyzing the process of decision-making in the community (through the attitudinal variables) including the comparisons of sample responses with those of the influentials on a number of key matters.

In order to determine who were influentials in Livermore, we used the technique employed by others of soliciting attributions of influence from presumably knowledgeable respondents. These respondents were, initially, a group of scientists and technicians employed at the Radiation Laboratory of the University of California, including the Assistant Director of Civil Defense for Livermore; they had been active in the movement to have the city adopt a program of community fallout shelters. Each member of this group was asked to name the persons whom he considered most influential in community affairs. As a result, a list of 16 persons was compiled.

Following this, certain persons in official positions were each asked to nominate the most influential persons. Some of these men had themselves been named influential by the first group. After collating these names, an additional group was added by interviewing two persons previously named as being generally influential in Livermore by the others. From the master list obtained in this manner, we observed the frequency

of mentions for each name; if a person was mentioned two or more times, he was selected for inclusion in the group for special observation and interviewing. Using this procedure a final list of 34 names was compiled. Again, no claim is made that this list is either exhaustive or an accurate representation of the most generally influential persons in community decisions or issues in Livermore.

Having compiled this list of influential persons in the community, the problem then was to determine what roles they played in the community with respect to the specific issue of community fallout shelters. This problem was approached in several ways: first, several of the key influentials were informally interviewed after a public meeting on the topic of fallout shelters for the community; secondly, the entire list of influentials was interviewed during the sample survey of the general population; thirdly, a detailed analysis was made of the newspaper accounts and letters-to-the-editor columns for persons mentioned; finally, several of the pro and con group as determined from the newspaper and other sources were interviewed.

3. The Natural History of the Issue

Bearing in mind the special characteristics of Livermore as the home of three nuclear research institutions, we may examine the development of the fallout protection issue and its current status. Early in 1960, a number of scientists and other technical employees of these laboratories undertook the construction of their own private home fallout shelters. At about the same time, several others formed a private group to build a family shelter for the group. This latter group was called Survival Associates, Inc. and opened its membership to the community at large.

Individuals from both of these groups publicly urged the city to immediately undertake the consideration of a community shelter plan for the protection of the entire population.

Upon the request of the civil defense staff, the Shelter Evaluation Advisory Committee was appointed by the City Council in July, 1960. This committee was given the assignment to investigate the potential danger to Livermore in the event of a nuclear attack and to propose protective means.

The committee appeared to be well qualified to cope with its assignment. Its membership included three physicists, one school administrator, a hospital administrator, two professional engineers, one radiation control technician, one construction contractor, and a building inspector. After seven months of work, they prepared and transmitted a report to the City Council in March, 1961. Their report concluded that the neighborhood group shelter plan had the most advantageous features and recommended that consideration be given to a community shelter program. Action, however, was deferred for a variety of reasons, lack of public concern probably being the major factor.

In August, 1961, only five months later, in the midst of international crises, the President of the United States made a public address urging immediate attention to civil defense preparedness. A small group of local citizens formed the Citizens Committee on Public Fallout Shelters, and began to circulate a petition urging the City Council to undertake immediate consideration of providing a community fallout shelter system. In a period of five weeks, this group obtained approximately 3,700 signatures of registered voters, about 50 percent of the total number of registered voters. The petition was presented to the City Council in September, 1961; following

this, the Council decided that a technical report should be prepared concerning the many facets involved in housing the entire population in community shelters.

A comprehensive technical study of the engineering, sociological, site location, financing, and other factors involved in a community shelter program was undertaken. This study was completed and a report published in April, 1962. Copies of the report were made available to the general population and special interest groups in the community as well as to communities throughout the nation.

The City Council proposed to hold a public meeting at which the report would be presented to the public. Following this, the recommended method for financing such a proposal would have to be initiated; i.e., an assessment district would have to be established by petition of property owners. No date was set for this public meeting. In the meantime, the international crises had once again subsided, and public and official interest likewise appeared to wane.

It was at approximately this point in time that the C-E-I-R study was begun. Local officials became oriented with the study and, in turn, oriented the staff concerning the status of the community shelter program in Livermore. A tentative date for the public meeting had been set for either late September or early October. The C-E-I-R study design called for a survey of community attitudes before the public meeting and once again after the meeting.

A number of visits were made to Livermore to select the list of leading citizens and to informally interview them. At a meeting of the

City Council, the Shelter Report was discussed at some length and the date for the public meeting was rescheduled for December 12.

In the fall of 1962, international events concerning our relations with Cuba began to assume serious proportions. About midway through the community survey, President Kennedy made an address to the nation which once again highlighted the need for civil defense preparation. In fact, military steps were initiated in connection with the Cuban crisis. At this point, a decision was made to modify the study plan and to take advantage of the crisis to determine if there was any effect upon attitudes and opinions about war and community fallout protection. Fortunately, the staff was able to take immediate steps to modify the interview instrument and to reinterview those who had already been interviewed as well as to increase the sample size of those to be interviewed for the first time.

On December 3, less than one week before the public meeting, Survival Associates, Incorporated, opened their newly completed fallout shelter for public inspection. Prominent local, state, and federal civil defense officials attended this well-publicized event. The national news wire services also picked up the story and gave it nation-wide publicity.

In preparation for the public meeting to be held on December 12, the local newspaper carried a series of six feature articles on the front page that were intended to provide a summary of the shelter report. The newspaper, furthermore, carried a front-page headline story concerning the meeting on December 12.

The meeting, which was held in the local high-school auditorium (seating capacity of about 350), was attended by about 250 persons. A tape recording of the question-answer part of the meeting was made by the C-E-I-R

project staff. In addition to the city officials participating in the program, the state civil defense director and the regional federal civil defense director addressed the meeting. The meeting itself was well-organized in terms of the manner in which the technical material concerning the location, construction, interior design, housekeeping, and other factors was presented to the audience.

After the formal presentation of the report, the meeting was opened for discussion from the audience. Judging from the tenor of the questions and the general over-all response, it was apparent that there was heavy support for the community shelter program. Of the several questions from the audience, only one or two appeared to be hostile toward the program. In response to questions from the audience concerning next steps toward action on the proposal for shelters, the Council members stated that the shelter issue would be discussed at the next meeting of the City Council. In discussions with Council members and other city officials after the meeting, we were told that many persons were opposed to the program even though they did not speak at the meeting. Particular reference was made to the fact that the method of financing, which requires formation of an assessment district on residential property, would be a major obstacle because large parcels of undeveloped residential tract property were held by a few owners.

On December 17, the City Council met to consider the matter of petitions for the formation of a fallout shelter assessment district. Shortly after the Council meeting was called to order, the chamber was filled to capacity with approximately 50 people in attendance. The Mayor, as per

custom, called for questions from the audience. The first person to speak was a woman who had spoken in opposition to the shelter program on ideological grounds at the public meeting. She read a brief prepared statement and presented a petition with 130 names to the City Clerk. This petition called upon the city to hold a "plebescite." The City Manager pointed out to her that the plebescite would only be advisory to the Council under the legal terms of setting up an assessment district.

Following this exchange, several persons in the audience at the Council meeting made statements and asked questions of the Council that indicated more hostility toward the shelter program than had been apparent at the public meeting the preceding week. Most of these hostile questions came from younger persons in the audience; in fact, there were very few older people present. The person who was the representative of what might be called the older age group raised objections on the grounds of increased taxes.

The chairman of the Citizens Committee on Public Fallout Shelters asked if his group could assist the Council in any way. He indicated that they were prepared to circulate an assessment district petition. A motion to place the matter on the agenda was made by one of the Council members and, after some discussion among the Council members (with one member in opposition), the matter was called for a vote. Despite this member's opposition, he joined the other Council members in unanimously approving the preparation of petitions calling for formation of an assessment district.

Two significant statements with regard to the petitions were made by city officials. First, the Mayor stressed that he would not approve the

release of the petition for circulation until he was convinced that the public was given much more information about the proposed shelter program. Secondly, the City Manager stated that "Because the cost of engineering is so high, ... I would not recommend action on the district unless the Council received a petition from an overwhelming majority of the property owners, 70 percent or more." He pointed out, furthermore, that a few large property owners held the future of the program in their hands, because their holdings came close to 50 percent of the total land area in the city.

During the rest of this pre-Christmas week, several key leaders in the city were interviewed. The focus of these interviews and observations was on such factors as the past history of the community with regard to other major issues, whether they felt fallout shelters were an important issue for the community and their own attitudes about it. Finally, an attempt was made to obtain an understanding of the community power structure.

In general, the community leaders who were interviewed with regard to the community fallout shelter issue had a "wait and see" attitude. There was a reluctance to make public statements about this matter. They seemed to want to first determine how strongly the general public felt about the issue, whether the public was willing to spend the necessary funds, and finally, what the federal government was going to do about shelters.

Also during this week, two letters by the woman mentioned above which were in opposition to the community shelter program were published in the local newspaper. She again called for an election on the issue and charged that the City Council was "railroading" the program without an expression from the people. In discussions with the editor of the local paper, we were

told that opposition to the shelter program would slowly begin to develop after the holidays and as the assessment petitions were circulated throughout the city. However, it must be pointed out that all during this week, there was a general reluctance of residents to discuss the issue, at least with strangers.

At the next Council meeting on January 9, the City Manager announced that the petition forms for a fallout shelter assessment district might be ready in two weeks. The two leading protagonists of the issue in the community, the chairman of the aforementioned citizens' committee for shelters and the woman who had previously expressed opposition, attended this meeting and participated in the discussion. The Mayor once again cautioned against moving too rapidly with the circulation of the petitions.

Community shelters for fallout protection dominated the front page of the local newspaper on January 21. Three major news stories were carried on that day. First, the leading story of the day concerned the announcement of the success of the 36-hour fallout shelter test conducted by Survival Associates, Inc., in which 92 persons had participated. Secondly, a story was carried to the effect that shelter opponents were preparing a petition opposing the program. This story also identified as the leader of the opposition group a resident who manages many "flat-top" duplex rental units for their owner, a San Francisco physician. He was quoted as confirming that among those who had signed his opposition petition were several sub-dividers and owners of large parcels of land. Opposition appeared to focus on the financing of the shelters with the opponents contending that the federal government should assume the major financial responsibility.

It should be noted that opposition by subdividers was particularly important because the "vote" on the shelter program was in terms of square feet of land held by each owner. Thus, those owners of large blocks of land had far greater influence than individual home owners. The third story in the newspaper concerned the fact that the shelter petitions were now ready and would be discussed at the Council meeting that night.

The City Council tentatively approved the petitions that were presented pending an approval of a statement by the Council about the shelter program. Once again, opponents and proponents of the issue clashed at the Council meeting. Two weeks later, the Council finally approved the petitions along with two statements which were to be attached to them. An interesting development was reported in the news story of this action. The chairman of the Citizens Committee on Public Fallout Shelters indicated that his group was not prepared to circulate the petitions among property owners until it had discussed certain details of the assessment district financing with the bond counsel of the city. This was the first indication of some reluctance on the part of the pro-shelter group to take action toward securing community fallout shelters.

The next issue of the newspaper carried a complete description of the statements approved by the City Council to accompany the petitions for an assessment district. These included rather detailed estimates of financial costs for various types of residential classifications, multiple uses of the shelters, management and communication, etc.

In the meantime, the letters-to-the-editor column of the paper had carried several letters both for and against the shelters. Furthermore, a

news story on February 11 announced the formation of a committee to oppose the formation of an assessment district; the co-chairman of this committee was the person named as representing the physician owner of several duplexes in Livermore. Also on the committee was the woman who had actively been opposing the shelters on ideological grounds.

At this point in time, a new issue appeared in the community. This issue concerned a memorandum of the school superintendent criticizing teachers for not providing more emphasis on patriotism in their classes. For the next several weeks, this issue dominated the community. In fact, from this point on, that is the middle of February, the local newspaper carried no further news stories nor letters to the editor concerning community fallout shelters.

Early in May, a final field trip was made to Livermore to interview key people on both sides of the issue and the editor of the newspaper. In the course of a meeting with the editor, we were informed that very little recent discussion and action with regard to the shelter issue had taken place. He also stated that the Citizens Committee for Public Fallout Shelters had decided not to circulate the petitions because the three large land developers would not sign the assessment district petition. Since these developers represent about 30 percent of the residential square feet in the city, they could stop the district's formation. The editor also indicated that, off-the-record, the Committee had decided to wait until more people moved into these developments as property owners; furthermore, according to him, they felt that with another international crisis the chances for approval would be improved.

We discussed the matter of who had participated in this issue in the community. He pointed out that the so-called influentials in the community had not participated in this issue. In his opinion, Livermore did not have a "single power group" but rather that there were numerous people recognized as "intelligent and active in civic affairs." According to the editor, both groups, the pro- and anti-shelter committees, represented relatively small numbers of people. This was particularly true of the anti-shelter committee. The anti-shelter group was essentially composed of one large-rental-property owner of low-cost apartments, a non-resident of the area, and those opposed on ideological grounds. When asked about the position of the land developers, he pointed out that they had never publicly issued a statement on their stand with respect to the shelter assessment district. Their position, however, was known to the "insiders," i. e., the committee leaders on both sides of the issue. Finally, the editor felt that the anti-shelter committee did not represent property owners in general.

An effort was made to interview the chairman of the anti-shelter committee but he was unavailable. It was discovered that he did not live in Livermore, although he worked in the community as a rental-property manager. This information was obtained from an interview with the woman who was a member of this committee and who had been actively opposing the shelter program on ideological grounds. She stated her viewpoint as being that fallout shelters are morally wrong, ". . . they contribute to the arms race." Although she admitted that the shelters would probably provide some protection, she felt that there were many unresolved matters

connected with life in the shelters and with the future that disturbed her. Furthermore, she pointed out that she was not in favor of unilateral disarmament. Interestingly, this woman apparently was disturbed by the membership composition of her committee. She made several references to the fact that the leading force on her committee was motivated by profit. She also pointed out that the fallout shelter issue cut across the usual liberal-conservative lines in the community. That is, there were people of political liberalism and conservatism on both sides of the issue.

During the interview she revealed that the anti-shelter committee had circulated a counter-petition and were holding it in readiness to submit to the City Council should the pro-shelter committee submit a petition for an assessment district. She stated that two of the three land developers had signed the anti-shelter petition.

The Assistant Director for Civil Defense was also interviewed briefly and he felt that the leading opponents of the assessment district for community shelters were the owners of rental property and some of the land developers.

Finally, during this last field trip to Livermore, the chairman of the Citizens Committee on Public Fallout Shelters, a physicist at the Livermore Radiation Laboratory, was interviewed. He confirmed that there had been no further action taken on the petitions for the assessment district by his committee. His reasons, however, were that both he and his vice-chairman were extremely busy at the Laboratory and could not find the time to devote to the matter. He indicated that the fact that the land developers would not sign the petition was a major stumbling block

and that this would necessitate a change in strategy. The new strategy was to re-define the limits of the assessment district to exclude these new developments, temporarily at least, and to solicit signatures from people within the built-up core of the city. Furthermore, he also confirmed what the editor of the newspaper had said with regard to waiting, if possible, for the right psychological moment before starting their petition campaign; that is, they would like to wait for another international crisis. When asked if he felt that the issue was dead, he replied emphatically that it was not dead but only dormant.

The chairman of the Citizens Committee was then read the list of the names of the influential or key people in Livermore and asked to indicate if he knew them, how they stood on the shelter issue, and if they had been active on the issue. He knew about three-fourths of the names read to him; of these persons, he stated that not one of them had been active on this issue, either pro or con. In fact, he felt that he knew the position, for certain, of only one-fifth of the persons listed. Finally, he was asked if he had ever been active in community affairs on any other issues such as the fallout shelter program and he stated that this was the first time he had been involved in a community matter.

Community Leadership and Decision-Making

During the entire period of observation of Livermore, an analysis of the local newspaper coverage of the fallout issue was maintained. This analysis included recording the names of all persons mentioned in the press in connection with the issue, both in the news columns and in the letters-to-the-editor column. When these names were examined, they

confirmed the fact that none of the community leaders or influentials that had been named in the early stages of this study were mentioned in the local press in connection with this issue.

On the basis of the findings of this study, we must conclude that the men named as influential by knowledgeable people in the community did not, in fact, exert influence in this issue. This finding thus confirms the results of Polsby [17], Dahl [4], and Wolfinger [22]. In fact, the results of our study are in agreement with the statement by Ehrlich with respect to the reputational method: "It remains to be demonstrated that persons who have a reputation for power, in fact, successfully exercise their power, and that their power cuts across issue areas to some extent."[6]

It might be well to recall the interview with one of the persons mentioned as influential, a prominent attorney and former president of the Chamber of Commerce in Livermore. He felt that there was no such thing as a power group in Livermore; that perhaps there had been once but not any more. He said, "There is a vacuum of leadership in this town that is not filled by the Lab people or the downtown businessmen. I'm involved in politics here and I see it when I try to develop a candidate for public office." He also pointed out that the leaders of the shelter program were unknown to him; they apparently had not been active in political or other civic affairs before. This, of course, was later confirmed by interviewing the issue spokesmen.

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[6] See D'Antonio and Ehrlich [5], p. 926.

The matter of issues and the competition for public support among them is of some relevance here. The attorney made a significant point when he said, "But this town has many issues, every one of them is critical, even a zoning change, and community shelters are only one of several issues facing the public. How excited can you get about every issue before running dry?" On a larger level than the community there appears to be a similar phenomenon. A recent issue of The Reporter magazine noted:

> What makes an issue an issue, and when is it no longer one? This year most of our worrying is concentrated on the tax structure. Last year medical care for the aged was the big thing... Typically, a period of intense concern is followed by either legislative failure or sudden indifference, or both... the very paraphernalia of concern--that sudden spate of articles, speeches, studies, and pledges--may function as a substitute for action rather than as a stimulation to action. In other words, as soon as everyone has made his position clear, we are free to turn our attention to something else.[7]

But none of these remarks shed light on the inactivity or non-leadership of those persons presumed to be influential in the community. Since we did not propose to study this particular matter, our data do not help us answer this problem; it is, however, worthy of further study. This brings us to the final portion of our analysis of community leadership and power in Livermore; namely, how did the influentials compare with the sample of the general population in their attitudes toward community shelters?

Analysis of the survey results indicated that a smaller percentage of the community leaders than of the general population were in favor of

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[7] The Reporter (May 9, 1963), p. 12. The experiences of the community shelter controversy in suburban San Francisco is a case in point, see Ekman et al. [8].

community shelters. With respect to private shelters, almost half of the influentials favored them as contrasted to 37 percent of the sample population. This is indicated in the following table.

Table 2B

Comparison Between General Public and Special Group of Community Leaders Regarding Attitudes Toward Shelters

	Community Shelter				Private Shelter			
	Livermore		Norwalk		Livermore		Norwalk	
Attitude	Gen. Public	Special Group	Gen. Public	Special Group	Gen. Public	Special Group	Gen. Public	Special Group
Favor	66%	56%	64%	30%	37%	48%	30%	25%
Opposed	14	26	16	40	33	34	34	40
Neutral	15	9	14	10	22	9	28	30
Don't Know	4	9	6	20	8	9	8	5
No Response	1	-	-	-	-	-	-	-

It may be speculated that the lag of the community leaders behind the attitudes of the general population with respect to community fallout shelters may be related to the relative inaction on the issue in the community. The lack of open and active support on the part of any of the influentials may have also been a factor in the history of this issue.

We may further speculate that one of the factors involved in the non-participation of the influentials is the fact that the community fallout shelter issue is controversial. The key leaders are usually active in such community programs as United Fund campaigns, Red Cross drives, hospital fund campaigns, etc., all of which are neutral types of community action and certainly are not controversial. Support for such a viewpoint may be found in the community studies on fluoridation and urban renewal programs.

C. The Social Systems of Norwalk

1. General Characteristics of Norwalk

The city of Norwalk resembles Livermore, California, only in the fact that both are approximately the same distance from a metropolitan area. In all other respects, Norwalk more closely resembles communities such as Aurora or Waukegan near Chicago in that it is what the sociologist or planner would call a satellite city. Typically, such cities are dependent upon the larger city for many activities but also have some independent economic and social characteristics. Because of distance between Los Angeles and Norwalk, data obtained were more limited in scope and detail; consequently, we were not able to do a detailed kind of social-anthropological study in Norwalk as was done in Livermore.

Basically, the procedure of investigation was similar to what had been used in Livermore. Contacts were established initially with several leading figures in the community and a type of "cobweb" approach was used to interview other persons mentioned as influential or knowledgeable. It was found that Norwalk, unlike Livermore, had not experienced a significant increase in scientific and engineering personnel since World War II. Furthermore, it was the opinion of most of the respondents that people with engineering or scientific backgrounds were not in positions of leadership in the community. In fact, the results of observation and interviewing of several key persons indicated that leadership appeared to lie primarily in the business and professional group (especially law), and secondarily in the labor and religious groups of the city.

With respect to population composition, Norwalk has experienced a rapid population growth since the end of World War II. It has a population

of approximately 68,000 people according to the 1960 census. Prior to World War II, the population had been more or less stable, with slight increases registered in each decennial period. For a variety of reasons, including improved transportation facilities, new industry, etc., the city began to develop rather rapidly in the post-war period. As a consequence, Norwalk, unlike the surrounding communities, is not primarily a commuting center but appears to have a large labor force that works and lives in the city. The arrival of new types of industry has brought rather large numbers of skilled laborers into the community, but not as many scientists and engineers as in the case of Livermore. Perhaps, more significantly, this community has been experiencing a growth in its Negro population and to a lesser extent in its Puerto Rican population. The recent Negro arrivals, unlike the older Negro residents, are migrants from the rural deep South. According to one of the leaders of the political parties who classified himself as a "liberal," these migrants are relatively uneducated and have no skills; hence, they perform manual type labor. In these respects, the Puerto Ricans may be said to be in a similar status.

Politically, Norwalk is somewhat unique in local government. One of the City Council members explained the rather peculiar type of government under which the city operates. In addition to a council-mayor type of government, there are three independent districts within the city, each with its own taxing power. Furthermore, the Board of Estimate has a veto power over the financial outlays of the city. Both of these features tend to complicate city-wide expenditures and are of particular interest with respect to a capital outlay such as would be necessary in a community shelter building program.

2. The Natural History of the Issue

Two practically simultaneous local events appeared to have been instrumental in stimulating the interest of Norwalk citizens in community fallout shelters. The first of these events took place in October, 1961. A noted radiologist, Dr. John Heller, spoke simultaneously at a meeting of Norwalk PTA groups and over a local radio network about the effects of radiation as a consequence of a nuclear attack.[8] At about the same time, another scientist had also been engaged in making a series of addresses to local groups, including the PTA in Norwalk and the adjacent communities. As a result, a great deal of interest and anxiety was created in the community.

The second event that influenced the community fallout shelter activity in Norwalk also occurred in the latter part of 1961. The business manager of the Norwalk school system, Norman Heap, had independently developed a plan for community shelters under the public school grounds.[9] This plan was presented to the Norwalk Civil Defense Advisory Committee for discussion and action. The local newspaper gave considerable coverage to the details of the plan and, as a consequence of the anxiety created by the PTA meeting mentioned above, the report stimulated much community discussion.

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[8] According to a news story concerning these events in the Norwalk Hour, Dr. Heller was director of the New England Medical Research Institute of Ridgefield, Connecticut. He was also a consultant to the Atomic Energy Commission, to the United States Navy on radiation, and to the U. S. Air Force on manned satellites, according to the news account.

[9] Mr. Heap, prior to becoming business manager of the school system in Norwalk, was a Major in the U. S. Air Force in North Dakota in the Air Defense Command. In North Dakota, he had organized the western half of the state for Civil Defense purposes.

Subsequently, a series of semi-private meetings were held in the home of Dr. Heller with various interested parties represented. At these meetings the report prepared by Mr. Heap was endorsed, and recommendations were made to the local officials to endorse it also. The Norwalk Civil Defense Advisory Committee did, in fact, endorse the Heap plan shortly thereafter.

At this point in time, local leaders in the community became concerned with the matter and the Norwalk Chamber of Commerce, in particular, began to take an active interest in the Heap proposal. The Chamber of Commerce referred the matter to a special committee on shelters to study the entire matter of community shelters. With the appointment of this committee by the Chamber of Commerce, another action took place. The Mayor of Norwalk appointed a new Citizens Civil Defense Advisory Committee.

It should also be noted that, simultaneously, the local chapter of SANE was taking an active part in opposing the Heap plan. Considerable discussion was taking place in the community concerning the effects of a nuclear attack and the protection afforded by various types of shelters.

The Chamber of Commerce Shelter Committee held a series of meetings to study the matter of shelters, including at least one meeting with Mr. Heap. Individual members of the committee were assigned to make studies of various aspects of the problem of shelters and, in addition, they interviewed a number of engineering firms to undertake a feasibility study for Norwalk. The Chamber committee recommended that such a study should be undertaken. This report was considered by the Mayor's new Civil Defense Advisory Committee together with the Heap plan. The

Advisory Committee decided to defer any action on the Heap plan and recommended to the City Council that a contract to make a study be signed with an engineering firm. However, by the summer of 1962, the City Council tabled the entire matter.

It was at approximately this time that C-E-I-R selected the city of Norwalk as a site for one of its community studies. Hence, it must be realized that the study began when the question of community fallout shelters in Norwalk was no longer a pressing issue in the community.

3. Community Leadership and Decision-Making in Norwalk

We may now turn to an examination of the participation of the community leaders of Norwalk in the decision-making processes with respect to the shelter issue. A similar pattern of behavior was manifested in Norwalk as was observed for Livermore. That is, the active protagonists on either side of the issue were people who were not identified as influential or as community leaders by the reputational method that we employed. They were, like the Livermore issue leaders, persons who had typically not been active in other leading programs or issues in the community. On the other hand, the recognized top leaders of the community were not involved in the issue with the exception of one person, the former head of the Mayor's Civil Defense Advisory Committee. A further modification of the Livermore experience insofar as leadership participation was concerned was the interest taken by the Chamber of Commerce in the issue. Some of the members of the Chamber of Commerce Shelter Committee were persons named as influential members of the community. Their active involvement

in the issue through the Chamber of Commerce probably had an effect on the final outcome of the issue, namely, the deferment of further action by the City Council. Unquestionably, the easing of international tensions also had an effect on the final outcome.

With respect to the analysis of the community leaders' opinions on community shelters in contrast to those of the general public of the community, it may be observed that, while two out of every three persons interviewed in our sample favored community shelters, only six of the twenty leaders favored them (see Table 2B). In Livermore, it will be recalled that thirteen out of twenty-three leaders had favored a community shelter plan. In both communities the leaders were less favorable toward community shelters than was the general public; this was particularly true in Norwalk.

III. THE QUESTIONNAIRE AND FIELD PROCEDURES

A. The Questionnaire

Given the objectives of the study as described in the six questions listed in Section I of this report, it was clear that there were certain things which must be asked. In designing the questionnaire there was considerable discussion as to whether or not the objectives of the study should be thoroughly concealed amidst other irrelevant matters. However, it was felt that this degree of deviousness would be very costly in time, both in designing the instrument and in administration of the questionnaire. Moreover, it was felt that an easy, relaxed opening was of great value. Therefore, openness and an invitation to talk freely were felt to be desirable. Thus, the first question was, "Have you given any thought to fallout protection for yourself and your family?" followed by probes as to how much and by what stimuli. This was an easy entry to the more difficult task of securing opinions regarding more sensitive subjects.

After this opening, which covered how thought had been stimulated (newspapers, radio-TV, magazines, talking with people), and which terminated with questions about the respondent's own position on public and private fallout shelter protection, the respondent was presented with about twenty items to which he was asked to respond in terms of agreement or disagreement.

In beginning the construction of a questionnaire, it was felt that some questions would likely be regarded as sensitive by both respondent and interviewer if either realized that these matters were indeed our objectives. Moreover, respondents would be interviewed by different groups of

interviewers working under widely differing conditions; therefore it seemed desirable to ask the questions in a form which had the following characteristics:

a) their intent was somewhat disguised

b) their format was standardized

c) the analysis of the answers was performed in a completely standardized manner.

Guttman scalogram analysis[1] is a procedure which lends itself perfectly to these objectives, and it was decided that this technique would be employed in probing some of the more fundamental and affect-laden areas.

The basic feature of the scalogram analysis is the notion of consistency of responses. If items are properly constructed, then for a set of responses to be consistent they would be required to imply responses to other items. Thus, taking a simple case, let us suppose that the following items are presented to Mr. Jones who weighs 157 pounds:

a) You weigh less than 140 pounds Agree Disagree

b) You weigh less than 150 pounds Agree Disagree

c) You weigh less than 160 pounds Agree Disagree

d) You weigh less than 170 pounds Agree Disagree.

Once c) has been answered in the affirmative, then so must d). Once b) has been answered in the negative, then so must a). In this case consistency is not hard to check, nor is it likely that respondents will answer inconsistently. However, in a realistic case, the matter is not so clear. Nevertheless, a pattern of consistency, or near consistency, for a particular set of items

[1] See Torgersen [21], pp. 307-336; and Guttman [10].

administered to a particular population can be established. Measures of the degree to which inconsistency occurs, or can occur, are generated, and if these attain a minimum level, then an acceptable "scale" is developed. The result of the development of this "scale" is that each respondent is placed in a "box" or category, which is one of a set of simply ordered categories to which are assigned strength of feeling of the attitude.

The twenty items referred to above, plus another group of about the same size presented later in the questionnaire, constitute the basis for construction of six Guttman scales. The particular sets of items were randomized and unclustered so that respondents would not easily grasp the pattern of the questioning. The six scales which were sought after were:

1) bellicosity toward foreign antagonists of the United States
2) liberal-conservative position regarding U. S. domestic economic and social policy
3) beliefs as to consequences of U. S. involvement in thermonuclear war
4) beliefs as to efficacy of fallout shelters in protection of life against thermonuclear attack
5) strength of desire for rapid action in construction of a fallout shelter system
6) anomie, or feeling of social isolation and powerlessness.

In addition to these six scales, a group of questions were asked which turned out to have resulted in a scale. (This may be due, in part, to the fact that they were asked in succession, enabling respondents to construct responses which are internally consistent.) These questions

had to do with the probability of occurrence of thermonuclear war involving the United States within varying periods of time, ranging from six months to ten years into the future.

These questions were followed, in turn, by a sequence of questions about conversations with other persons about fallout shelters, identification of persons with whom such conversations were held, opinions of those persons, and the effect of these conversations on the opinion of the respondent. These questions were all put directly, and it appeared that very few people would admit being influenced by another person. The questioning then turned to newspaper and magazine readership, membership in organizations and action of organization, including those of which the respondent is not a member. In each case the respondent was asked about the effect of such exposure on his opinions.

Following these questions, the respondent was asked about any disagreements he might have had on the question of fallout shelters with any persons with whom he has contact.

At this point the second group of scale items appeared, followed by the questions about chances of war. Then began a series of "face-sheet" types of questions, although these were not all straightforward. Thus, in asking about occupation, there was a great deal of probing as to the nature of work of the respondent (or respondent's husband if the respondent was a married woman) including number of persons working for the subject, and whether or not the subject is self-employed. These data, together with the respondent's own estimate of his social class, were used to give a somewhat more objective measure of social class membership.

This procedure was developed by R. H. Ellis. The last of the "face-sheet" items had to do with religion, membership (preference was added in the Norwalk questionnaire), and frequency of attendance at religious services.

Then the respondent's attention was directed to the cost of shelters, public and private. He was given the information that "experts have estimated the cost of fallout protection in group shelters at between two and three hundred dollars per person. The cost per person in individual family shelters is estimated to be higher." Then he was asked what he would be willing to spend out of his pocket, per person, for fallout protection and how much he would be willing to see governments spend per capita. Finally, he was asked again how he feels about community shelters, whether his opinion had changed in the preceding twelve months, if so how, and again the same questions about private shelters. Finally, he was asked to make any remarks he wished to make on the subject.

Aside from changes in format and wording, the major changes which developed out of the pre-test were in the Guttman items. It was found, on the basis of 40 pre-test interviews, that some of the sets of items did not appear to be eliciting scales. These were modified. It would appear that the modifications were successful. The changes from the Livermore to the Norwalk questionnaire were, again only in wording and format, based on interviewer experience in Livermore.

Thus, the basic questionnaire was directed at getting answers to the six sorts of questions listed in Section I of this report.

As a consequence of the fact that President Kennedy's speech on Soviet missile emplacements in Cuba came when field work in Livermore

was only partially completed, an additional sample was drawn, and those already interviewed were reinterviewed. Those who were first interviewed a week or more after Kennedy's speech were asked all the same questions as the earlier respondents plus a number of questions concerned with beliefs which were held before the Cuba crisis as to the likelihood of war, and opinions which were held before the crisis on the shelter question. The reinterview questionnaire contained questions as to opinions on fallout shelters for the community, questions on conversations on the matter, and the scale items. Finally, both questionnaires carried a question on the relative importance, in the opinion of the respondent, of fallout shelters to the community, comparing them with other projects such as recreation facilities, roads, schools, etc.

B. Selection and Training of Interviewers

The interviewers for this study were selected in the following fashion:

(1) Each interviewer was required to complete an application form in his own handwriting. This form was used to determine and evaluate such matters as previous experiences, education, and legibility of handwriting.

(2) A personal interview was arranged with the field supervisor at this time; appearance, personality, sincerity and adaptability were also evaluated.

(3) Sample interviews were conducted by the interviewer. These interviews were edited for complete and meaningful answers, and accuracy in following instructions.

Male and female interviewers were selected to work on this study.

Each interviewer attended a two-day training session at which he was supplied with written specifications and instructions concerning the administration of the questionnaire and sampling procedure.

The administration of the questionnaire was thoroughly explained question by question as follows:

(1) Each question and the instructions concerning that question were explained in detail for the interviewer during a general briefing session. It was established by the field director that every question and its administration was clearly understood by each interviewer before preceding to the next question.

(2) Every interviewer was required to complete several practice interviews. These questionnaires were edited in the presence of the individual interviewer and all omissions, errors, or lack of complete, clear answers were discussed with the interviewer at that time.

(3) After completing the first day of interviewing in the field, the interviewer was required to bring the completed questionnaires to the field director for editing before continuing with his assignment.

(4) The interviewer was accompanied by the field director on an actual interview. Any irregularity concerning the interviewer's technique or administration of the questionnaire was corrected.

The implications of the sample design in terms of interviewer field procedure were laid out in detail for the interviewers at the training session. This briefing involved the use of separate block maps with detailed listing and counting instructions. In both studies the sample was

pre-listed. That is, following detailed instructions, some interviewers first listed all addresses in the sample blocks. Then, based on the sample design, a list was prepared for each block designating addresses to which interviewers were to be sent and who was to be interviewed at each address.

IV. TABULATION AND ANALYSIS OF SURVEY RESULTS

A. The Samples

A sample consisting of men and women who are the heads of households or their spouses was obtained at each of the two communities selected for our case study. Each person in the sample was then interviewed and a total of 461 interviews was obtained in Livermore. Among these interviews, 441 interviews came from a probability sample[1] which was drawn by means of the block sampling method. The rest of the interviews were from a special group composed of community leaders such as mayor and city manager. In the case of Norwalk, 270 interviews were completed. Of these 270 interviews, 250 interviews came from a probability sample drawn by the same sampling approach as in Livermore; the rest were solicited from community leaders.

Analysis of data pertaining to the special groups is presented elsewhere in this report. Applications of various statistical techniques, results of which are presented in the remaining sections of this report, were confined to the probability samples. For a detailed discussion of the method used for drawing the probability samples, the reader is referred to Appendix A.

The representativeness of the two probability samples was examined by comparing each sample and its respective population with respect to the following demographic variables: age, sex, marital status, educational level, number of children per household, and home owner or renter. Results were tabulated and are presented below. All figures in the tables are expressed in percentages. The population figures for Livermore were based on 1960

[1] See Appendix A for a detailed sampling plan.

population and housing censuses for Tracts LI-0018, LI-0019 and LI-0020 in Alameda County, California; for Norwalk they were based on 1960 census figures for the Norwalk standard metropolitan statistical area.

Table 4A-1

Sample and Population Distributions of Age

	Livermore		Norwalk	
Age	Sample	Population	Sample	Population
20-29	24%	23%	14%	18%
30-39	36	30	24	24
40-49	21	20	27	22
50-59	9	12	19	17
60-69	6	8	8	11
70 and over	4	6	8	9

The Livermore sample was slightly under-represented by the older age population. However, overall agreement between the sample and population distributions was quite remarkable. As to Norwalk, there were proportionally less young people in the sample as compared to the population. Note that the California community has a higher percentage of young age group than Norwalk.

Table 4A-2

Sample and Population Distributions of Sex

	Livermore		Norwalk	
Sex	Sample	Population	Sample	Population
Male	50%	49%	44%	47%
Female	50	51	56	53

The Livermore sample was more representative of its population with respect to sex distribution as compared to its counterpart from Norwalk. There was a substantially higher proportion of female respondents in the Norwalk sample.

Table 4A-3

Sample and Population Distributions of Marital Status

Marital Status	Livermore		Norwalk	
	Sample	Population	Sample	Population
Single	4%	16%	3%	20%
Married	89	76	84	69
Separated	1	1	2	1
Widowed	4	5	9	8
Divorced	2	3	2	2

Married people were over-represented in both samples. Perhaps this was due to the fact that the frame from which a sample was drawn was composed of households.

Table 4A-4

Comparison of Sample and Population Distributions of Educational Level

Educational Level	Livermore		Norwalk	
	Sample	Population	Sample	Population
7th Grade or Less	5%	11%	9%	17%
Completed 8th Grade	23	12	34	16
Completed High School	28	45	26	46
Some College	20	14	14	9
4 Years of College or More	24	17	16	12

Both samples had a very high proportion of college-educated people as compared to their respective population, and high-school graduates were vastly under-represented. The fact that we have samples with above-average educational level should be borne in mind when we try to interpret survey results.

Table 4A-5

Comparison of Sample and Population Distributions of Home Owners

	Livermore		Norwalk	
	Sample	Population	Sample	Population
Home Owner	70%	68%	75%	63%
Renter	30	32	25	37

Home owners were somewhat over-represented in both samples. Since opinions of home owners are of prime importance in determining whether a community will proceed with the construction of fallout shelters, it is probably useful to have a higher proportion of home owners in our samples.

B. Analyses of Cross-Classified Data

Data obtained from our two sample surveys were cross-classified with respect to two or more polytomies. Upon cross-classification, the degree of association that exists between the several polytomies was investigated. Several statistics are available for such purpose, for example, contingency coefficients based on the χ^2 statistic, correlation coefficients and Goodman-Kruskal's Tau. In this study, the Chi-square test of

independence was applied to all the two-way tables whenever the data met the requirements.[2]

Survey results are discussed in the following order: (1) the straight tabulation of attitudes on the shelter issue, (2) the effect of the Cuban crisis on the shelter issue (this applies only to the Livermore sample), (3) the relationship between responses on the shelter issue and various demographic variables, (4) the relationship between responses to the shelter issue and participation in various organizational activities, and (5) the impact of various communication media on the shelter issue (this also applies only to Livermore).

1. Attitudes on the Fallout Shelter Issue

It was found that nearly two out of every three respondents in both samples approved of their respective community shelter programs. This was indeed an overwhelming majority. Support for private shelter programs was less enthusiastic. Only one out of every three respondents from the Livermore sample was in favor of the government encouraging private individuals to have their own shelter; there were almost as many respondents opposing private shelter programs. In Norwalk, there was even less sympathy for private shelter programs; in fact, the opposition outnumbered the supporters. Relative frequencies are presented below:

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[2] The reasons for not using other statistics were as follows: The correlation coefficients are based on an assumption of multivariate normal distribution. It is clear that the correlation coefficients do not apply to our type of data because most of the polytomies considered in our study do not satisfy the assumption of normality. Goodman-Kruskal's Tau has an attractive feature. It has an operational meaning which is derived from a probabilistic model for activity to which the cross-classification may typically lead. Unfortunnately, the sampling distribution of this statistic is not known.

Table 4B-1

Attitudes on Fallout Shelter Issue

Attitude	Community Shelter		Private Shelter	
	Livermore	Norwalk	Livermore	Norwalk
Favor	66%	64%	37%	29%
Opposed	14	16	33	34
Neutral	15	14	22	29
Don't Know	4	6	8	8
No Response	1	-	-	-

A cross tabulation of each sample was made with respect to attitudes on community and private fallout shelters. Results are given in the following tables:

Table 4B-2

Cross Tabulation of Attitudes on Shelter Issue - Livermore

Attitudes on Private Shelters	Attitudes on Community Shelters					
	Favor	Opposed	Neutral	Don't Know	No Response	Total
Favor	122	21	17	3	2	165
Opposed	101	24	19	2	-	146
Neutral	54	11	28	6	-	99
Don't Know	15	5	3	8	-	31
No Response	-	-	-	-	-	-
Total	292	61	67	19	2	441

Table 4B-3

Cross Tabulation of Attitudes on Shelter Issue - Norwalk

Attitudes on Private Shelters	Attitudes on Community Shelters: Favor	Opposed	Neutral	Don't Know	No Response	Total
Favor	53	8	7	4	-	72
Opposed	61	17	7	1	-	86
Neutral	34	15	16	6	-	71
Don't Know	11	-	5	5	-	21
No Response	-	-	-	-	-	-
Total	72	86	71	21	-	250

Some frequencies of interest in Tables 4B-2 and 4B-3 were converted into percentages. They are shown in Table 4B-4. This gives us some idea regarding the extent of interactions between people's attitudes toward public vs. private shelter programs.

Table 4B-4

Interactions Between People's Attitude Toward Two Types of Shelter Programs

Attitude	Livermore	Norwalk
Favor C.S. and P.S.*	28%	21%
Favor C.S. but oppose P.S.	23	24
Favor C.S. but neutral to P.S.	12	14
Oppose C.S. but favor P.S.	5	3
Oppose C.S. and also oppose P.S.	5	7
Oppose C.S. but neutral to P.S.	2	6
Neutral to C.S. but favor P.S.	4	3
Neutral to C.S. but oppose P.S.	4	3
Neutral to both	6	6
Other	11	13

* C.S. and P.S. stand for community shelter and private shelter respectively.

Judging from the data, the California community has a somewhat stronger pro-shelter movement as compared to Norwalk. Nevertheless, the overall agreement between the two frequency distributions is remarkable.

2. Effect of the Cuban Crisis on Opinions about Shelters

When the interviewing at Livermore was about two-thirds over, the Cuban crisis broke. In response to this unexpected event the sample was extended by an additional 60 percent, and 199 people who had been interviewed already were successfully reinterviewed. This provided most interesting data for studying changes in public attitudes on shelters due to a direct threat of thermonuclear war.

As expected, when reinterview data was examined, substantial attitudinal changes were observed. There was an increase of 10 percent in the proportion of those supporting community as well as private shelter programs. There was also a noticeable decrease in the number of people who did not take any definite stand in regard to bomb shelter issues. As a result of the Cuban crisis, practically nobody in the reinterviewed group maintained the position of "don't know." Relative frequency distributions are given in the following table:

Table 4B-5

Effect of the Cuban Crisis on Shelter Issue - Livermore

Attitude Toward Shelter Issue	Pre-Crisis		Post-Crisis	
	Community Shelter	Private Shelter	Community Shelter	Private Shelter
Favor	66%	36%	76%	45%
Opposed	16	36	12	28
Neutral	13	20	11	25
Don't Know	5	8	1	2

The entire sample was divided into three subgroups according to the date of interview. The first group consists of respondents interviewed on or before October 22, 1962[3]; members of the second group were interviewed in the week of October 23 to 28, when the international situation was most tense; the third group is made up of those who were interviewed after October 28. The attitude of each group toward the shelter issue was investigated by calculating a relative frequency within each subgroup. This is shown in Table 4B-6.

Table 4B-6

Attitude on Shelter by Interview Date - Livermore

Attitude on Shelter Issue	Community Shelter			Private Shelter		
	Group 1	Group 2	Group 3	Group 1	Group 2	Group 3
Favor	63%	66%	71%	37%	43%	37%
Opposed	17	17	9	36	21	33
Neutral	15	9	17	18	21	28
Don't Know	5	8	3	9	15	2

Generally speaking, one detects an increasing trend in the proportion of people who favor the shelter programs. It is interesting to note that in the case of community shelters a substantial increase was observed in Group 3, whereas, in the case of private shelters, a large increase was associated with members of the group who were interviewed when the international tension was at its height.

[3] This was the date President Kennedy made his TV appearance to announce the grave situation in Cuba.

3. Relationships between Some Demographic Variables and Attitudes on the Shelter Issue

A majority in each sample supported the proposed program for the construction of public shelters in their respective community. Nevertheless, there was a sizeable number of people in both communities who held an opposing view. In order to study if there were any demographic factors which might be considered responsible for different points of view with regard to the proposed civil defense measure, a two-way tabulation of each sample was made; i.e., each sample was first categorized with respect to each respondent's stand on the community shelter issue and then each subsample was further categorized with respect to a demographic characteristic of interest.

A similar procedure was applied to each sample for the purpose of studying if any demographic variable may be considered to be related to responses to the private shelter issue.

To each two-way table thus derived, the χ^2 test of independence was applied whenever the data in the table met the requirements for applying the statistical test; the calculated χ^2 statistic and its significance level were noted in the footnote.

Age

One's attitude toward the shelter issue did not appear to be independent of this demographic factor. It was found that younger people tend to be more in favor of some type of shelter program than older age groups. This finding appeared to bear out a prediction made by Maitland Henry, editor of a local paper in Livermore. He indicated that the major opposition to community shelters focused on the older age groups. He emphasized that he felt, in general, that the older people opposed the program on economic grounds.

Mr. Henry also felt that there may be some feeling among this group that they were closer to death and had less of an investment in life itself, thus lending support to the fatalistic view. Actual frequency tables of age on shelter attitudes are presented below:

Table 4B-7a

Attitudes on Fallout Shelters by Age*

Livermore Sample

Attitude on Fallout Shelters	Age 20-29** C.S.	P.S.	30-39 C.S.	P.S.	40-49** C.S.	P.S.	50-59 C.S.	P.S.	60-Over C.S.	P.S.	Total C.S.	P.S.
Favor	73	46	116	66	63	32	23	14	17	7	292	165
Opposed	10	31	21	47	8	35	8	15	14	18	61	146
Neutral	18	20	19	40	17	21	6	7	7	11	67	99
Don't Know	5	10	3	6	4	5	3	4	4	6	19	31
Total	106	107	159	159	92	93	40	40	42	42	439	441

* For community shelter issue, $\chi^2 = 29.54$ with 12 degrees of freedom (d.f.); for private shelter issue, $\chi^2 = 19.02$ with 12 d.f.

** The discrepancy between the totals in each of these two columns was due to a respondent whose attitude toward the community shelter program could not be classified into one of the four responses in the table.

Table 4B-7b

Attitude on Fallout Shelters by Age

Norwalk Sample*

Attitude on Fallout Shelters	Age 20-29 C.S.	20-29 P.S.	30-39 C.S.	30-39 P.S.	40-49 C.S.	40-49 P.S.	50-59 C.S.	50-59 P.S.	60-Over C.S.	60-Over P.S.	Total C.S.	Total P.S.
Favor	26	12	43	23	48	12	27	13	15	12	159	72
Opposed	3	10	10	14	6	31	12	21	9	10	40	86
Neutral	4	8	5	19	11	21	7	9	8	14	35	71
Don't Know	1	4	2	4	3	4	2	5	8	4	16	21
Total	34	34	60	60	68	68	48	48	40	40	250	250

* Data did not meet the requirements for the χ^2 test.

Sex

Men in both communities appeared to be more interested in shelter programs, especially in private shelter programs. This was interpreted not so much as an indication of opposition to shelter programs by female residents of both communities, but as being due to the fact they either had not formed any definite opinion about the shelter issue or they were inarticulate about it. Actual frequencies are given in Tables 4B-8a and 4B-8b.

Table 4B-8a

Attitudes on Fallout Shelters by Sex

Livermore Sample*

Attitudes on Fallout Shelters	Male		Female		Total	
	C.S.	P.S.	C.S.	P.S.	C.S.	P.S.
Favor	149	96	143	69	292	165
Opposed	34	58	27	88	61	146
Neutral	26	50	41	49	67	99
Don't Know	4	9	15	22	19	31
Total	213	213	226	228	439	441

* For community shelter, $\chi^2 = 10.28$ with 3 d.f.; for private shelter issue, $\chi^2 = 15.55$, with 3 d.f.

Table 4B-8b

Norwalk Sample*

Attitudes on Fallout Shelters	Male		Female		Total	
	C.S.	P.S.	C.S.	P.S.	C.S.	P.S.
Favor	66	35	93	37	159	72
Opposed	22	40	18	46	40	86
Neutral	16	31	19	40	35	71
Don't Know	5	3	11	18	16	21
Total	109	109	141	141	250	250

* For community shelter, $\chi^2 = 3.46$, with d.f.; for private shelter, $\chi^2 = 8.38$, with 3 d.f.

Marital Status

Since both samples were drawn from a frame composed mainly of single dwelling units, nearly 90 percent of each sample were married. This meant that there were not sufficient observations falling into other categories, such as "single," "divorced," "separated" and "widowed," to be able to draw any significant statistical inference about the effect of marital status on attitudes toward shelters.

Religious Preference

The samples were categorized according to the following five religious groups:

1. Not member of any church
2. Catholic
3. Liberal non-Catholic:

Buddhist	Friends (Quaker)
Congregational	Jewish (all types)
Eastern Orthodox	Methodist
Episcopalian	Presbyterian
Ethical Culture	Unitarian

4. Middle-of-the-road non-Catholic:

Baptist	Luthern
Christian	Protestant (unspecified)
Church of Christ	

5. Conservative non-Catholic:

Assembly of God	Protestant Community Church
Christian and Missionary Alliance	Radio Church of God
Church of the Nazarene	Russian Orthodox
Evangelical Free Church	Seventh Day Adventist
Jehovah's Witnesses	Unity Church
Pentecostal	Mormon

Various Christian denominations and other religions were grouped into five categories as above. A religion is considered "conservative" if its activities are based strictly on the teaching of the scriptures and does not have an elaborate theology.

Table 4B-9a

Attitudes on Fallout Shetlers by Religious Affiliation

Livermore Sample*

Attitudes on Fallout Shelters	Non-Member		Catholic		Liberal Non-Catholic		Middle-of-Road Non-Catholic		Conservative Non-Catholic		Total	
	C.S.	P.S.	C.S.	P.S.	C.S.	P.S.	C.S.	P.S.	C.S.	P.S.	C.S.	P.S.
Favor	91	52	68	38	76	43	38	23	19	9	292	165
Opposed	23	44	12	30	13	47	8	13	5	12	61	146
Neutral	23	35	11	20	26	23	3	14	4	7	67	99
Don't Know	6	12	3	6	4	7	2	1	4	5	19	31
Total	143	143	94	94	119	120	51	51	32	33	439	441

* For community shelter, $\chi^2 = 15.91$ with 12 d.f.; for private shelter, $\chi^2 = 11.80$ with the same degrees of freedom.

Table 4B-9b

Norwalk Sample*

Attitudes on Fallout Shelters	Non-Member		Catholic		Liberal Non-Catholic		Middle-of-Road Non-Catholic		Conservative Non-Catholic		Total	
	C.S.	P.S.	C.S.	P.S.	C.S.	P.S.	C.S.	P.S.	C.S.	P.S.	C.S.	P.S.
Favor	15	6	79	38	42	18	16	6	7	3	159	71
Opposed	8	11	14	36	12	24	3	11	2	4	39	86
Neutral	5	9	11	31	13	23	4	4	2	3	35	70
Don't Know	1	3	8	7	4	6	2	4	-	1	15	21
Total	29	29	112	112	71	71	25	25	11	11	248	248

* χ^2 test was not applicable.

Our survey findings indicated that in comparing the two communities Norwalk has a much higher proportion of Catholics, but Livermore has a high proportion of non-church members. Nevertheless, it was found that in both communities attitudes on fallout shelters were independent of religious affiliation.

Socio-Economic Class

There were two questions in the questionnaire which were concerned with measurement of an individual's socio-economic level. In the first question, the person interviewed was asked to indicate a subjective evaluation of his socio-economic standing in the community; in the second question he was asked to state his occupation.[4] Responses to these two questions were then combined to yield a score.[5] Based on this score the person was placed in one of the following five categories: Upper class, Upper-Middle class, Middle-Middle class, Lower-Middle class and Lower class.

Analysis of the following contingency tables, indicated that there was no significant relationship between socio-economic level and attitude on fallout shelters. This was a surprising result because it is logical to expect attitudes on private shelters to be positively correlated with socio-economic level because of the high cost of shelter construction. Actual frequency tables are presented below:

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[4] A detailed classification of occupation is given in Appendix B.

[5] This might appear somewhat arbitrary on the surface. Nevertheless, we found a statistically significant association between this variable and an index of education level. In the case of Livermore, the correlation coefficient between these two variables was 0.64478; it was 0.59296 for Norwalk. The sample size was 438 in the former and 248 in the latter. This finding itself was no surprise; however, it was an indication that socio-economic position had been properly scaled.

Table 4B-10a

Attitudes on Fallout Shelters by Socio-Economic Level

Livermore Sample***

Attitudes on Fallout Shelters	Upper-Middle* C.S.	P.S.	Middle-Middle C.S.	P.S.	Lower-Middle C.S.	P.S.	Lower C.S.	P.S.	Total C.S.	P.S.
Favor	63	35	90	47	70	45	62	35	285	162
Opposed	12	33	19	51	20	38	7	17	58	139
Neutral	12	19	21	32	14	19	16	26	63	96
Don't Know	3	3	5	5	4	6	6	13	18	27
Total	90	90	135	135	108	108	91	91	424**	424

* Since only three respondents were classified into the upper class, they were combined with the upper-middle class.

** Some observations were lost in the process of calculating a score of socio-economic level because of the lack of information on a respondent's occupation or his own evaluation of social standing.

*** For community shelter, $\chi^2 = 6.90$ with 9 d.f.; for private shelter, $\chi^2 = 20.61$ with 12 d.f.

Table 4B-10b

Norwalk Sample***

Attitudes on Fallout Shelters	Upper-Middle* C.S.	P.S.	Middle-Middle C.S.	P.S.	Lower-Middle C.S.	P.S.	Lower C.S.	P.S.	Total C.S.	P.S.
Favor	16	9	46	22	34	17	53	19	149	67
Opposed	7	14	11	26	9	14	11	29	38	83
Neutral	6	5	7	20	8	19	11	19	32	63
Don't Know	-	1	5	1	3	4	4	12	12	18
Total	29	29	69	69	54	54	79	79	231**	231

* Nobody was classified into the upper class in this sample.

** Again some observations were lost for the same reason as in Table 4B-10a.

*** The χ^2 test was not applicable.

Education Level

The sample was classified according to the following four levels of education: 8th grade or less; completing high-school; receiving some college education; and four or more years of college training.

Our hypothesis was that a well-educated person would be more likely to be knowledgeable about the consequence of thermonuclear war and, consequently, he could make a more rational judgment regarding the efficacy of shelters. This assumption, however, was not substantiated by our data. Perhaps this was an indication that information regarding the efficacy of fallout shelters has not been well disseminated among the public in general.

Table 4B-11a

Attitudes on Fallout Shelters by Educational Level*

Livermore Sample

Attitudes on Fallout Shelters	8th Grade or less		High School		Some College		4 years of College		Graduate Work		Total	
	C.S.	P.S.	C.S.	P.S.	C.S.	P.S.	C.S.	P.S.	C.S.	P.S.	C.S.	P.S.
Favor	74	48	94	45	60	34	40	20	24	18	292	165
Opposed	19	34	14	47	11	31	12	23	4	10	60	145
Neutral	18	25	18	33	19	24	5	10	7	7	67	99
Don't Know	7	11	9	11	3	5	-	4	-	-	19	31
Total	118	118	135	136	93	94	57	57	35	35	438	440

* For community shelter, $\chi^2 = 15.46$; and for private shelter, $\chi^2 = 10.16$; neither was significant for 12 degrees of freedom.

Table 4B-11b
Norwalk Sample*

Attitudes on Fallout Shelters	7th Grade or less		8th Grade		High School		Some College		4 years of College or more		Total	
	C.S.	P.S.	C.S.	P.S.	C.S.	P.S.	C.S.	P.S.	C.S.	P.S.	C.S.	P.S.
Favor	17	5	50	25	44	19	26	15	22	8	159	72
Opposed	2	6	17	25	7	22	4	14	10	19	40	86
Neutral	1	6	13	30	12	18	3	4	6	13	35	71
Don't Know	2	5	6	6	2	6	3	3	3	1	16	21
Total	22	22	86	86	65	65	36	36	41	41	250	250

* For community shelter, $\chi^2 = 12.08$ for private shelter, $\chi^2 = 19.19$. Degrees of freedom were 12 in both cases.

Parental Status

Our hypothesis was that parents with children at home would be more likely to take a sympathetic view of shelter construction programs than those without children or whose children have left home. In both communities, the above hypothesis appeared to be valid at least with respect to the community shelter issue; however, the same factor was found to be independent of people's attitude toward private shelters. Frequency tables and χ^2 statistics are presented below:

Table 4B-12a
Effect of Children on Fallout Shelter Attitudes*
Livermore Sample

Attitudes on Fallout Shelters	No Children		One Child or more		Total	
	C.S.	P.S.	C.S.	P.S.	C.S.	P.S.
Favor	84	52	208	113	292	165
Opposed	31	55	30	91	61	146
Neutral	26	29	41	70	67	99
Don't Know	7	13	12	18	19	31
Total	148	149	291	292	439	441

* In community shelter, $\chi^2 = 12.05$; for private shelter, $\chi^2 = 3.16$. There were 3 degrees of freedom in both cases.

Table 4B-12b
Norwalk Sample*

Attitudes on Fallout Shelters	No Children		One Child or more		Total	
	C.S.	P.S.	C.S.	P.S.	C.S.	P.S.
Favor	59	30	100	42	159	72
Opposed	19	39	21	47	40	86
Neutral	21	31	14	40	35	71
Don't Know	10	9	6	12	16	21
Total	109	109	141	141	250	250

* For community shelter, $\chi^2 = 9.12$; for private shelter, $\chi^2 = 0.22$. There were 3 degrees of freedom in each case.

Number of Years of Residence in Community

Difference between the two communities in regard to this characteristic is quite pronounced. Over 40 percent of the respondents in our Norwalk sample have resided in Norwalk for more than 20 years. In Livermore, the corresponding group accounted for only 12 percent of the sample. Since most of the residents new to Livermore work for defense-oriented industry, it was suspected that their superior knowledge about nuclear weapons systems would cause them to take a favorable stand on the community shelter issue. Judging from the calculated χ^2 statistic, this hypothesis appeared to be valid.

There was an indication that old-timers in Norwalk tend to prefer private shelters to community shelters. However, this could not be statistically confirmed.

Actual frequencies are given in the following tables:

Table 4B-13a

Attitudes on Fallout Shelters by Numbers of Years of Residence in Community*

Livermore Sample

Attitudes on Shelter Issue	Duration of Residence in Community: 0-2 yrs.		3-5 yrs.		6-10 yrs.		11-20 yrs.		Over 20 yrs.		Total	
	C.S.	P.S.	C.S.	P.S.	C.S.	P.S.	C.S.	P.S.	C.S.	P.S.	C.S.	P.S.
Favor	95	54	73	41	69	34	31	18	23	17	291	164
Opposed	16	46	18	41	8	27	6	14	13	18	61	146
Neutral	23	28	15	28	9	20	7	10	13	13	67	99
Don't Know	5	12	7	4	3	8	2	4	2	3	19	31
Total	139	140	113	114	89	89	46	46	51	51	438	440

* For community shelter, $\chi^2 = 19.43$ with 12 degrees of freedom; for private shelter, $\chi^2 = 5.11$ with the same degrees of freedom.

Table 4B-13b

Norwalk Sample*

Attitudes on Shelter Issue	Duration of Residence in Community: 0-2 yrs.		3-5 yrs.		6-10 yrs.		11-20 yrs		Over 20 yrs.		Total	
	C.S.	P.S.	C.S.	P.S.	C.S.	P.S.	C.S.	P.S.	C.S.	P.S.	C.S.	P.S.
Favor	27	11	16	6	31	13	33	12	52	30	159	72
Opposed	4	18	3	6	5	19	3	16	25	27	40	86
Neutral	6	5	2	9	5	7	7	12	15	38	35	71
Don't Know	1	4	1	1	1	3	2	5	11	8	16	21
Total	38	38	22	22	42	42	45	45	103	103	250	250

* Data did not meet the requirements for the χ^2 test.

Home Owner vs. Renter

Since the proposed construction of community shelters was supposed to be financed by additional property taxes, it was expected that the opinions of home owners and those of non-property owners, such as renters, would be different. This hypothesis appeared to be valid for Norwalk on the basis of the χ^2 test; but data from the Livermore sample did not bear out this hypothesis. With respect to the private shelter issue the situation was completely reversed; i. e., the hypothesis was valid for Livermore but not for Norwalk.

Actual frequencies are presented in Tables 4B-14a and 4B-14b.

Table 4B-14a

Attitudes on Fallout Shelters by Home Owners and Renters

Livermore Sample*

Attitudes on Shelters	Home Owner		Renter		Total	
	C.S.	P.S.	C.S.	P.S.	C.S.	P.S.
Favor	200	117	92	48	292	165
Opposed	44	105	17	41	61	146
Neutral	46	69	21	29	67	98
Don't Know	13	13	5	18	18	31
Total	303	304	135	136	438	440

* For community shelter, $\chi^2 = 0.40$ and for private shelter, $\chi^2 = 11.56$; the degrees of freedom were 3 in each case.

Table 4B-14b

Norwalk Sample*

Attitudes on Shelters	Home Owner		Renter		Total	
	C.S.	P.S.	C.S.	P.S.	C.S.	P.S.
Favor	113	55	46	17	159	72
Opposed	37	66	3	20	40	86
Neutral	27	54	8	17	35	71
Don't Know	9	11	7	10	16	21
Total	186	186	64	64	250	250

* For community shelter, $\chi^2 = 10.70$ and for private shelter, $\chi^2 = 5.83$, there were 3 degrees of freedom in both cases.

White Collar vs. Blue Collar[6]

Each sample was classified according to whether or not the head of a household possesses some manual or technical skills. Our hypothesis was that those who possess such skills are more likely to be confident of their own survival after a large scale nuclear war provided they can weather the initial attack under shelter protection. Consequently, they will favor the construction of fallout shelters.

Our data appeared to support this hypothesis, especially in Livermore. Actual frequency tables are presented below with their respective χ^2 statistics.

Table 4B-15a
Attitudes on Shelters by Occupational Classification
Livermore Sample*

Attitudes on Shelters	Blue Collar		White Collar		Total	
	C.S.	P.S.	C.S.	P.S.	C.S.	P.S.
Favor	202	122	90	43	292	165
Opposed	40	87	21	59	61	146
Neutral	38	67	29	32	67	99
Don't Know	10	16	9	15	19	31
Total	290	292	149	149	439	441

* For community shelter, $\chi^2 = 5.41$ with 3 d.f.; for private shelter, $\chi^2 = 9.42$ with 3 d.f.

6 The term "blue collar," as it was used in this study, has a much broader meaning than its customary usage; for example, an engineer who operates a highly intricate machine such as an electronic computer was classified as "blue collar." The term was used for lack of a better alternative.

Table 4B-15b
Norwalk Sample*

Attitudes on Shelters	Blue Collar C.S.	Blue Collar P.S.	White Collar C.S.	White Collar P.S.	Total C.S.	Total P.S.
Favor	91	40	68	31	159	71
Opposed	20	41	19	45	39	86
Neutral	13	38	22	32	35	70
Don't Know	5	10	10	11	15	21
Total	129	129	119	119	248	248

* For community shelter, $\chi^2 = 6.94$ with 3 d.f.; for private shelter, $\chi^2 = 1.48$ with 3 d.f.

4. Relationship between Participation in Organizational Activities and Attitude toward Shelters

A set of questions were included in both questionnaires to elicit responses for measuring the impact of organizational activities on one's attitude toward the shelter issue.

Both samples were first tabulated according to whether or not a respondent belongs to any organization, and then each subsample was further classified by respondent's attitude toward shelters. Specific frequencies are shown in the following tables.

Table 4B-16a
Attitude on Fallout Shelters by Organization Membership
Livermore Sample*

Attitude on Shelters	Do Not Belong to Any Organization C.S.	Do Not Belong to Any Organization P.S.	Belong to One or More Organizations C.S.	Belong to One or More Organizations P.S.	Total C.S.	Total P.S.
Favor	194	107	98	58	292	165
Opposed	38	91	23	55	61	146
Neutral	43	70	24	29	67	99
Don't Know	13	22	6	9	19	31
Total	288	290	151	151	439	441

* For community shelter, $\chi^2 = 0.51$ and for private shelter, $\chi^2 = 2.27$; 3 degrees of freedom in both cases.

Table 4B-16b

Norwalk Sample*

Attitude on Shelters	Do Not Belong to Any Organization C.S.	P.S.	Belong to One or More Organizations C.S.	P.S.	Total C.S.	P.S.
Favor	115	49	44	23	159	72
Opposed	23	63	17	23	40	86
Neutral	33	54	2	17	35	71
Don't Know	14	19	2	2	16	21
Total	185	185	65	65	250	250

* For community shelter, $\chi^2 = 14.89$ with 3 d.f.; for private shelter, $\chi^2 = 4.69$ with 3 d.f.

Judging from the calculated χ^2, there appeared to be no relationship between the number of organizations to which each respondent belongs and his attitude toward the shelter issue in the California community. On the other hand, the independence hypothesis must be rejected in the case of Norwalk.

Another measure of the degree of participation in organization activities was the number of offices held by each respondent in various organizations. It is of interest to know if those holding offices will have a different response pattern toward the shelter issue. Since the data pertaining to this factor did not meet the requirements for the χ^2 test, straight percentages were calculated for comparing the attitudes of those who hold offices and those who do not.

Table 4B-17a
Difference in Attitudes Toward the Shelter Issue
Between Office Holders and Non-Office Holders
Livermore Sample

Attitude toward Shelters	Office Holders C.S.	Office Holders P.S.	Non-Office Holders C.S.	Non-Office Holders P.S.
Favor	69%	34%	66%	38%
Opposed	14	46	14	31
Neutral	15	17	16	23
Don't Know	2	3	5	8

Table 4B-17b
Norwalk Sample

Attitude toward Shelters	Office Holders C.S.	Office Holders P.S.	Non-Office Holders C.S.	Non-Office Holders P.S.
Favor	76%	62%	52%	26%
Opposed	24	15	24	35
Neutral	-	15	19	30
Don't Know	-	7	5	9

In Livermore, there was no substantial difference between office holders and non-office holders with respect to the shelter issue, but in Norwalk a proportion of people who favor the construction of shelters among office holders was substantially higher than that of non-office holders.

It should be noted that the proportion of respondents who hold one or more offices in various social and service organizations in Livermore was about 14 percent of the sample; the corresponding figure for Norwalk was about 8 percent.

5. Impact of Various Communication Media on the Fallout Shelter Issue in Livermore

In Livermore, each respondent was queried as to whether he had given any thought to fallout shelter protection for his family or the people of the community. About 78 percent of the respondents gave an affirmative answer while the remaining 22 percent had not given any thought at all. Among this 78 percent of the sample, we were interested to know the extent to which they had given thought to the shelter issue; therefore, they were asked to indicate if they had given the matter "much thought," "some thought," or "a little thought." Furthermore, they also had to indicate which of the following communication media: radio/TV, newspapers, magazines, talking with people and mass meetings, had led them to think about the shelter issue.

Cross-classification tables were then formulated for the purpose of measuring the impact of each of the above media on the people's thought process with regard to the issues of fallout shelters, and the χ^2 statistics were calculated for each table.

Table 4B-18

Influence of Radio and TV on Thought on Fallout Shelters*

Livermore Sample

Thought Given to the Shelter Issues	Influenced by TV and Radio	Not Influenced	Total
A lot	85	55	140
Some	83	58	141
A little	37	27	64
Total	205	140	345

* $\chi^2 = 0.18$; not significant.

Table 4B-19

Influence of Newspapers on Thought on Fallout Shelters*

Thought Given to the Shelter Issues	Influenced by Newspaper	Not Influenced	Total
A lot	97	43	140
Some	110	31	141
A little	41	23	64
Total	248	97	345

* $\chi^2 = 5.03$; significant at the 0.1 level.

Table 4B-20

Influence of Magazines on Thought on Fallout Shelters*

Thought Given to the Shelter Issues	Influenced by Magazines	Not Influenced	Total
A lot	88	52	140
Some	63	78	141
A little	21	43	64
Total	172	173	345

* $\chi^2 = 18.22$; significant at the 0.001 level.

Table 4B-21

Influence of Talking with Other People on Thought on Fallout Shelters*

Thought Given to the Shelter Issues	Influenced	Not Influenced	Total
A lot	123	17	140
Some	115	26	141
A little	45	19	64
Total	283	62	345

* $\chi^2 = 11.00$; significant at the 0.01 level.

Table 4B-22

Influence of Attending Mass Meetings on Thought on Fallout Shelters*

Thought Given to the Shelter Issues	Influenced	Not Influenced	Total
A lot	44	96	140
Some	27	114	141
A little	5	59	64
Total	76	269	345

* $\chi^2 = 15.42$; significant at the 0.01 level.

The marginal totals at the bottom of each of the above tables were converted into percentages and are presented in Table 4B-23.

Table 4B-23

Influence of Various Communication Media upon the Shelter Issue

Communication Media	Proportion of the Sample	
	Influenced	Not Influenced
Radio and TV	59%	41%
Newspapers	72	28
Magazines	50	50
Talking with people	82	18
Mass meetings	22	98

On the basis of these percentages and the calculated χ^2 statistics, direct communication with other people appeared to be the most important factor for stimulating a person's thought on the shelter issue; newspapers and magazines were two other important factors. Although 59 percent of the sample indicated that their thinking on the shelter issue had been influenced by radio and TV programs, the calculated χ^2 statistic for this factor was not statistically significant. Only a small proportion of the respondents acknowledged that they

were influenced by discussion on the matters relating to civil defense in various mass meetings. This was probably due to the fact that only a small number of people in the community attend such meetings. It was interesting to note, however, that among those whose thinking was influenced by mass meetings, there were relatively many people who had given a great deal of thought to the shelter issue.

C. Relationships Between Some Demographic Variables and Knowledge and Beliefs about Nuclear War and Other Related Issues

As mentioned earlier, Guttman scales were constructed to measure the following seven items: 1) bellicosity toward foreign antagonists of the United States; 2) liberal-conservative position regarding U.S. domestic, economic and social policy; 3) beliefs as to consequences of U.S. involvement in thermonuclear war; 4) beliefs as to efficacy of fallout shelters in protection of life against thermonuclear war; 5) strength of desire for rapid action in construction of fallout shelter systems; 6) anomie, or feeling of social isolation and powerlessness; and 7) opinions as to the likelihood and timing of war. This section reports analyses of possible associations between each of the above seven attitudinal items with five demographic variables; viz., sex, age, education, parental status, religious preference, and home ownership. Results of analyses were compared with findings of the Michigan State study.[7]

The discussion is primarily based on correlation coefficients presented in Table 4C.

[7] See Berlo et al. [2], pp. 29-37.

Table 4C

Correlation Coefficients of Some Demographic Variables and Guttman Scores of Attitudinal Items*

Demographic Variable		Bellicosity L**	Bellicosity N**	Liberal-Conservative Position L	Liberal-Conservative Position N	Consequences L	Consequences N	Desirability L	Desirability N	Efficacy L	Efficacy N	Anomie L	Anomie N	Likelihood of War L	Likelihood of War N
Sex		-0.04950	-0.08680	-0.07812	-0.12585	-0.21985	-0.16221	-0.00183	-0.03763	-0.09001	-0.03898	0.01601	0.03890	0.05645	-0.08372
Education		0.20455	0.13181	-0.13164	-0.03904	-0.12534	-0.00606	0.05435	0.17596	-0.04691	0.00807	0.34105	0.29836	-0.00845	-0.11502
Parental Status		0.04107	0.11855	-0.03434	-0.06562	-0.05863	-0.07173	-0.15589	-0.20818	-0.18755	-0.22446	0.16068	0.09390	0.07014	-0.10493
Religion	Catholic	-0.04482	-0.10693	0.09931	0.04219	-0.00489	-0.05183	-0.09212	-0.14854	0.03457	-0.19834	0.04772	-0.01958	0.10997	-0.08380
	Liberal Non-Catholic	0.03850	0.14850	0.00113	-0.12082	-0.06968	0.07496	0.01257	0.04481	-0.02142	0.08310	0.07942	0.15325	-0.08204	0.03912
	Middle of Road Non-Catholic	0.01272	-0.00493	-0.08931	0.00784	-0.09389	-0.04686	-0.00433	0.01967	-0.07176	0.06524	0.00194	0.01111	-0.02442	0.05615
	Conservative Non-Catholic	0.01788	0.00984	0.02848	0.06897	0.03264	0.10307	0.00096	-0.01981	-0.00145	0.07378	0.01660	-0.12886	0.00587	-0.10530
Age		-0.18928	-0.18705	0.01292	-0.01265	0.00838	0.04453	0.19638	0.24893	0.15002	0.20441	-0.23609	-0.06613	0.05447	0.11345
Home Ownership		0.05164	0.05947	0.00230	-0.11595	-0.04591	0.06770	0.01288	0.17120	-0.07292	0.13027	0.14413	0.18037	0.08349	-0.02737

* For definitions of demographic variables and attitudinal items, see Table 5C.

** L and N stand for the Livermore and Norwalk samples respectively. The former has 438 observations; and the latter has 248 observations. In testing the hypothesis that the two variables are independent, the critical values of correlation coefficients for the 5 percent level of significance are approximately 0.095 and -0.095 in the case of Livermore; they are approximately 0.129 and -0.129 for the same level of significance in Norwalk. For example, if the calculated correlation coefficient from the Livermore sample is larger than 0.095 or less than -0.095, we should reject the hypothesis that the population correlation coefficient is zero at the 5 percent level of significance.

Sex

In both Livermore and Norwalk, the samples were almost evenly distributed with respect to sex. There were no noticeable differences between men and women in their responses on most of the attitudinal items except on the third item which is concerned with belief as to consequences of a large-scale global war.

It was found that men were more likely to be pessimistic about the outcome of U.S. involvement in thermonuclear war. This was true in both communities. This finding, however, was not in agreement with that of the Michigan State study.

Education

In both communities, the respondent with a higher education level was found to be less bellicose toward foreign antagonists, and was less likely to have a feeling of powerlessness or social isolation.

There were no significant differences between high-education and low-education groups with respect to their beliefs as to the utility of shelters and to their opinions in regard to the likelihood and timing of war.

In the case of Livermore, the more education the respondent had, the more likely it was that he had a liberal viewpoint toward domestic, economic and social policies and that he considered consequences of thermonuclear war unthinkable.

In Norwalk, education level was associated with the desirability variable; i.e., people with a higher education level were apt to consider shelter protection less desirable than those with a low education level.

Religious Preference

There was no a priori reason to believe that religious preference had any significant bearing on responses to the seven attitudinal items considered here. Analysis of data did not indicate a need for modifying our opinion. In this respect our findings concurred with those of the Michigan State study.

Age

Older people tended to be more bellicose in their attitude toward foreign antagonists. They were more likely to doubt the desirability and efficacy of shelter protection.

In Livermore particularly, the older respondent was more inclined to believe that he was socially isolated and was powerless to do anything about it. These findings all agreed with survey results of the Michigan State study.

Parental Status

Both samples were divided into two groups. The first group was composed of those respondents whose children are still living at home; the second group was composed of those respondents who have no children or whose children have left home.

There were no significant differences between these two groups with respect to most of the attitudinal items except the desirability and efficacy variables. The respondent from the first group was more likely to have placed a higher value on the utility of shelters and to have had a stronger desire for shelter protection. This statement was applicable to both communities.

It was also noted that in the case of Livermore, those with children at home were less likely to have a feeling of powerlessness or anomie. These findings were generally in accord with those of the Michigan State study.

Home Owners vs. Renter

In both communities, the respondent who owns his home was more apt to believe that he could do something about his own destiny. Home owners in Norwalk were more likely to be skeptical about the usefulness of shelters.

V. MULTIVARIATE ANALYSIS OF FACTORS RELATING TO ATTITUDES ON FALLOUT SHELTERS

A. Introduction

In the preceding section, a number of variables have been considered in association with public opinion on the issue of fallout shelter programs. Analysis was carried out on a bivariate basis; i. e., the relationship of each variable to the attitudes toward the shelter issue was studied individually. Thus, the question arose as to what is the combined effect of several variables on attitudinal changes regarding the shelter issue. In order to investigate this aspect of the problem, it was necessary to apply a multivariate analysis.

It was assumed that people who took a pro-shelter stand were different from those who were against the fallout shelter program with respect to some latent characteristics and that they could be classified on the basis of observations on these characteristics. The characteristics on which we had observations included most of the important demographic variables and responses to certain issues related to the problems of war and peace.

The principal objective of applying such an analysis was to explore the usefulness of this type of analysis for prediction of present and future attitudes toward fallout shelter programs on the basis of observed variables, some of them not obviously associated with civil defense. Specifically, we aimed to accomplish the following: (1) to identify the major variables associated with people's thinking on the matter of fallout shelters and to estimate the direction and magnitude of their influences; (2) to examine the predictive power of the estimated functional relationships; (3) to test the usefulness of the Guttman scores as predictors of attitudinal changes.

B. Methodology

The regression method was used. This served the dual purpose of prediction and description of associative conditions. Whether a person will or will not favor a certain shelter program is an "either-or" proposition; therefore, an artificial dependent variable assuming the value 1 or 0 for the purpose of estimating a regression line was defined. The calculated value of the dependent variable may then be interpreted as an estimate of the probability that a person will favor the shelter program given his values of independent variables. This type of regression analysis has been shown to be a variant of the method of discriminant functions. [1]

In this analysis we were not only interested in calculating the conditional probability that a person will favor a certain type of shelter program, but we would also attempt to obtain some quantitative measure of changes in the person's attitude which are due to changes in external factors. Estimated regression coefficients provide such measures.

C. Data and Definitions of Variables

The data came from the probability samples obtained at Livermore and Norwalk. Definitions of variables are exhibited in Table 5C.

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[1] See Kendall, [13], pp. 344-345.

Table 5C

Definitions of Variables

Variable Identification Number	Description of Variable
1	Sex
	1: if the respondent is male
	0: otherwise
2	Number of years in school
	1: 7th grade or less
	2: completed 8th grade
	3: completed high school
	4: some college - no degree
	5: completed college
	6: graduate work
3	Socio-Economic class
	1: upper class
	2: upper-middle class
	3: middle-middle class
	4: lower-middle class
	5: lower class
4	Home ownership
	1: if the respondent owns his house
	0: otherwise
5	Age
	1: under 20 years old
	2: 20 - 29 "

Table 5C (Cont'd.)

Var. Id. No.	Description of Variable
5	3: 30 - 39 years old
	4: 40 - 49 "
	5: 50 - 59 "
	6: 60 - 69 "
	7: 70 and over
6	Age squared
	1: under 20 years old
	4: 20 - 29 "
	9: 30 - 39 "
	16: 40 - 49 "
	25: 50 - 59 "
	36: 60 - 69 "
	49: 70 and over
7	Years of residence in the community
	1: lived in community 0 - 2 years
	2: " " 3 - 5 "
	3: " " 6 - 10 "
	4: " " 11 - 20 "
	5: " " over 20 years
8	Number of children
	1: one or more children
	0: no children

Table 5C (Cont'd.)

Var. Id. No.	Description of Variable
9	Religious affiliation * 1: if the respondent is Catholic 0: otherwise
10	1: if the respondent is liberal non-Catholic 0: otherwise
11	1: if the respondent is middle-of-road non-Catholic 0: otherwise
12	1: if the respondent is conservative non-Catholic 0: otherwise Variables 10-12 are set equal to 0 if the respondent cannot be classified into any of the above groups.
13	Guttman score** on the respondent's degree of bellicosity toward those countries with which the U. S. has the greatest differences at the moment 1, 2, - - - - - , 8 most bellicose ⟶ least bellicose
14	Guttman score on the liberal or conservative position of the respondent 1, 2, - - - - - , 8 liberal ⟶ conservative

Table 5C (Cont'd.)

Var. Id. No.	Description of Variable
15	Guttman score on attitude toward the consequences of war 1, 2, - - - - - , 8 consequences of war disastrous ⟶ not so disastrous
16	Guttman score on the respondent's desire for protection 1, 2, - - - - - , 8 shelters high desirable ⟶ not desirable
17	Guttman score on attitude toward efficacy of fallout shelters 1, 2, - - - - - , 8 most efficacious ⟶ least efficacious
18	Guttman score on the respondent's feelings of powerlessness or anomie 1, 2, - - - - - , 8 war is most likely ⟶ war is least likely

* See p. 56 for the detailed classification of religious affiliation.

** Discussion on the full meaning of Guttman scores can be found in Guttman [10].

D. Estimated Regression Functions

1. Livermore

In all, four regression functions were estimated from the Livermore sample using the same set of regressors as defined in Table 5C. Equations L1 and L2 were used to predict the probability of assuming a certain attitude (for or against) on the issue of community shelters. The difference between Equation L1 and Equation L2 was that the latter was based on a subset of the Livermore sample. For Equation L1, the dependent variable assumed the value of 1 if the respondent was in favor of the community shelter program; otherwise, it was given the value of 0. In Equation L2, the dependent variable was 1 if the respondent was in favor of the community shelter program; it was 0 if the respondent was against the community shelter program; if the respondent assumed either a neutral or "don't know" position, the observation was discarded. Equations L3 and L4 were used to predict the attitudes toward the private shelter issues. The difference between Equations L3 and L4 was similar to that between Equations L1 and L2.

The results of our estimates are shown in Table 5D-1. These results indicate that the set of 19 independent variables accounts for 14 to 39 percent of the variance associated with the attitudinal changes due to different values of the independent variables. The R^2's of the equations for predicting attitudes toward the issue of the public shelter are substantially higher than those of the equations associated with attitudes toward the private shelter issue. A possible explanation is that in the case of the community shelter issue the respondent was asked to state his opinion about a concrete issue, viz., the proposed program for the construction of community fallout

shelters in school grounds, whereas in the case of private shelter issue, he was queried about some issue which had not been clearly formulated. In other words, community fallout shelter supporters have already formed a cohesive group and their characteristics are more readily identifiable.

It should be noted that the R^2's for each of the four equations are statistically significant.

2. Norwalk

We also estimated four regression functions for Norwalk. Equations N1 and N2 were used to predict the probability that the respondent would take a certain attitude with respect to the issue of community shelters. Equations N3 and N4 were concerned with the private shelter issues. Both Equations N1 and N3 were based on the entire Norwalk sample, whereas Equations N2 and N4 were estimated from subsamples consisting of those respondents who answered either "yes" or "no" unequivocally to the questions relating to the community and private shelter issues.

The set of independent variables used was the same as in the Livermore case. Again the equations for the public shelter issue were found to fit the data much better. They accounted for 38 to 49 percent of the variance associated with the attitudinal changes. On the other hand, the prediction equations for the private shelter attitudes could account for only 10 to 16 percent of the variance.

Estimated regression coefficients and other relevant statistics are given in Table 5D-2.

Table 5D-1

Attitude Probability Prediction Equations

Livermore

Item	Community Shelters		Private Shelters	
	Equation L1	Equation L2	Equation L3	Equation L4
Constant	0.85789	0.79478	1.01241	1.03849
Variable 1	0.05278 (0.03973)*	0.01073 (0.03459)	0.13816 (0.04656)	0.20103 (0.05873)
" 2	0.00639 (0.02054)	0.00829 (0.01820)	0.01917 (0.02407)	0.03280 (0.02872)
" 3	-0.00938 (0.02416)	0.00330 (0.02120)	0.00601 (0.02831)	0.04108 (0.03565)
" 4	-0.01588 (0.04626)	-0.03543 (0.03913)	0.07972 (0.05420)	0.02162 (0.06599)
" 5	0.08025 (0.08000)	0.07166 (0.07100)	-0.06681 (0.09374)	-0.05267 (0.11622)
" 6	-0.00986 (0.00978)	-0.01024 (0.00876)	-0.00043 (0.01146)	-0.00555 (0.01432)
" 7	-0.01383 (0.01764)	-0.00366 (0.01535)	0.00391 (0.02067)	0.01198 (0.02496)
" 8	0.04360 (0.04772)	0.06761 (0.04186)	-0.08635 (0.05591)	-0.05868 (0.06807)
" 9	0.03060 (0.05475)	0.00529 (0.04628)	0.02098 (0.06415)	0.04355 (0.07810)
" 10	-0.03363 (0.05034)	0.05481 (0.04468)	-0.01586 (0.05899)	-0.01912 (0.07169)
" 11	0.04950 (0.06629)	0.00289 (0.05530)	0.00416 (0.07767)	0.00101 (0.09583)
" 12	-0.09991 (0.07701)	-0.09337 (0.06969)	-0.12925 (0.09024)	-0.20239 (0.11718)
" 13	0.02831 (0.01471)	0.04440 (0.01250)	-0.04729 (0.01723)	-0.03495 (0.02008)
" 14	0.01890 (0.01611)	0.01372 (0.01363)	0.01683 (0.01887)	0.01430 (0.02250)
" 15	-0.01910 (0.01453)	0.00149 (0.01378)	-0.01288 (0.01703)	-0.01428 (0.02213)
" 16	-0.13784 (0.01438)	-0.12255 (0.01281)	-0.03619 (0.01685)	-0.02856 (0.02148)
" 17	-0.02557 (0.01299)	-0.02475 (0.01154)	-0.03113 (0.01522)	-0.04497 (0.01975)
" 18	-0.00083 (0.01069)	-0.00217 (0.00978)	-0.00491 (0.01253)	-0.01609 (0.01667)
" 19	-0.00477 (0.01526)	-0.01024 (0.01318)	-0.01482 (0.01788)	-0.02452 (0.02190)
R^2	0.3435	0.3888	0.1369	0.1707
S_e	0.39231	0.30344	0.45968	0.47006
Sample Size	438	350	438	308
F value for overall relationship	11.5099	11.0481	3.4903	3.1209

* The figures in parentheses are the standard deviations of regression coefficients.

Table 5D-2

Attitude Probability Prediction Equations

Norwalk

Item	Community Shelters		Private Shelters	
	Equation N1	Equation N2	Equation N3	Equation N4
Constant	1.07091	1.17967	1.21583	2.29652
Variable 1	-0.08916 (0.05355)*	-0.04150 (0.04676)	0.04861 (0.06071)	0.02943 (0.08711)
" 2	0.00972 (0.02632)	0.00710 (0.02206)	-0.01425 (0.02984)	-0.06864 (0.04398)
" 3	0.01037 (0.03248)	-0.00998 (0.02842)	-0.05100 (0.03682)	-0.08460 (0.05605)
" 4	0.06239 (0.06803)	-0.02820 (0.05952)	0.09566 (0.07713)	0.08739 (0.11051)
" 5	0.03589 (0.10083)	0.04371 (0.08294)	-0.25069 (0.11431)	-0.56617 (0.17217)
" 6	-0.00768 (0.01129)	-0.06469 (0.05599)	0.02541 (0.01280)	0.05694 (0.01914)
" 7	-0.03010 (0.02014)	-0.03250 (0.01712)	0.01312 (0.02284)	0.04747 (0.03164)
" 8	-0.01843 (0.06703)	-0.06469 (0.05599)	-0.05807 (0.07599)	-0.08845 (0.11098)
" 9	0.00403 (0.08803)	0.03073 (0.07329)	0.08510 (0.09980)	0.10045 (0.14006)
" 10	-0.02372 (0.09399)	0.02381 (0.07998)	0.03777 (0.10655)	0.02347 (0.14981)
" 11	0.02613 (0.11193)	0.09965 (0.09433)	0.06845 (0.12689)	0.02415 (0.17536)
" 12	-0.07427 (0.14725)	0.05401 (0.12407)	0.07852 (0.16694)	0.14018 (0.23268)
" 13	-0.00572 (0.01891)	0.01567 (0.01565)	-0.02577 (0.02144)	-0.01841 (0.02725)
" 14	0.04254 (0.02405	0.01992 (0.02047)	0.01352 (0.02726)	0.01916 (0.04012)
" 15	-0.01202 (0.01625)	0.00608 (0.01510)	-0.01410 (0.01863)	-0.01968 (0.02757)
" 16	-0.12680 (0.01759)	-0.12939 (0.01497)	-0.05393 (0.01984)	-0.05148 (0.02866)
" 17	-0.02890 (0.01601)	-0.03233 (0.01411)	-0.00769 (0.01815)	-0.00959 (0.06510)
" 18	-0.00038 (0.01249)	0.00059 (0.01050)	0.00342 (0.01410)	-0.01007 (0.01916)
" 19	0.00131 (0.02007)	0.01070 (0.01763)	0.00474 (0.02276)	0.00402 (0.03264)
R^2	0.3820	0.4976	0.1056	0.1612
S_e	0.39327	0.19732	0.44584	0.48797
Sample Size	248	198	248	157
F value for overall relationship	7.4179	9.2772	1.4172	1.3859

* The figures in parentheses are the standard deviations of regression coefficients.

E. Explanatory Ability of Independent Variables

1. Demographic Variables

Sex

The estimated regression coefficients were statistically significant in Equations L1, L3, L4 and N1. As shown in Table 5D-1, sex has a positive coefficient in every prediction equation for Livermore. Our interpretation is that men in Livermore tend to be more in favor of the shelter programs than the women in the community. For Norwalk, only Equation N1 had a significant coefficient for this variable and it had a negative value. This would mean that the male population of the town was less sympathetic toward the community shelter program than the female population.

Educational Level

With the exception of Equation N4, the estimated coefficients associated with this variable were not statistically significant. Even in Equation N4, educational level had a negative coefficient which does not agree with our hypothesis that educated people are more knowledgeable about civil defense and hence will favor the fallout shelter programs. This tends to suggest perhaps that information regarding various civil defense measures has not been sufficiently disseminated among citizens of these two communities. This is a somewhat disappointing finding in view of the fact there has been a great deal of debate about the shelter issues in the communities.

Socio-Economic Class

Our hypothesis is that the low socio-economic classes will not support the private shelter program. This hypothesis appears to be correct with regard to Norwalk, because the socio-economic coefficients for Equations N3 and N4 had a negative value and were statistically significant.

This variable does not appear to have any significant influence upon the Livermore residents' thinking on the fallout shelter issues.

Home Owners Vs. Renters

The coefficients of this variable in Equations L3 and N3 were statistically significant. They make a positive contribution to the attitude probability. An obvious explanation is that those who own their homes are more likely to construct a private fallout shelter for themselves.

Age

Both age and age squared have been used to explain attitudes toward the shelter programs. Our hypothesis is that older people are less likely to have a favorable attitude toward fallout shelter programs, whereas young residents of the communities are more anxious to see some type of shelter program initiated in their community because they have more to lose if a large scale war should occur.

The estimated coefficient for age was positive for Equations L1, L2, N1 and N2, and its squared term was negative for the same set of equations except Equation N2. This indicates that the probability of a person favoring the community shelter program first increases and then decreases as age advances. However, most of these coefficients were not statistically significant.

In regard to the private fallout shelter issue in Norwalk, the situation is reversed. The coefficient for age was negative and its squared term was positive in Equations N3 and N4. This means that the probability of a person favoring the construction of private shelters first decreases and then increases with the advance of age. One possible explanation is that age

may be correlated to income; i.e., older people in the high income classes tend to support the private shelter program.

The above argument, however, cannot be substantiated on the basis of the Livermore sample. In fact, the coefficients for the age variables in Equations L3 and L4 were not statistically significant.

Years of Residence in the Community

This variable was of particular interest in the Livermore case because we wish to contrast attitudes of new residents vs. those of old residents in regard to the fallout shelter issues. In Livermore, the employment character of the city is dominated by several large nuclear laboratories. Employees of these laboratories are naturally better informed about the nuclear weapons system than the average citizen, and they are more likely to be new residents of the city. Our hypothesis is that those who have more accurate information about the nuclear weapons system can realistically evaluate the consequence of thermonuclear war and consequently will tend to endorse the fallout shelter programs.

In Livermore, the contribution of this variable to the probability that a person will support the community fallout shelter program decreases as the number of years of residence in the community increases. However, the estimated regression coefficients for Equations L1 and L2 were not statistically significant.

Residents who are relatively new to Norwalk are more likely to be in sympathy with the community shelter programs than the older residents. This conclusion was drawn on the basis of a negative value associated with the coefficient of this variable in Equations N1 and N2. These coefficients were statistically significant. One explanation is that this may be a

consequence of the economic issue involved. Most of new residents are not property owners; therefore, they do not have to assume the direct burden of financing the construction of community shelters.

The estimated coefficient for this variable in Equations L3, L4, N3 and N4 was positive, but none of them was statistically significant.

Number of Children in Household

Our hypothesis is that a respondent with children is more likely to be in favor of the shelter programs. This, however, cannot be substantiated from the coefficient of this variable because in most cases the coefficients were negative. Nevertheless, we probably should not place much significance on this variable because the estimated coefficients were only occasionally statistically significant.

Religious Affiliation

The sample was classified into five religious groups (see Page 56) and a dummy variable was set up for each group. In general the estimated regression coefficients were not statistically significant, with an exception of the coefficient associated with the dummy variable representing non-Catholic conservative religious groups in Equations L1, L2, L3 and L4. This coefficient had a negative value which means that a person belonging to this particular religious group is likely to oppose the fallout shelter programs.

2. Attitudinal Variables

In the course of this study, we have developed Guttman scales for the following attitudinal items: a) the respondent's degree of bellicosity toward those countries with which the U. S. has the greatest differences; b) the liberal or conservative position of the respondent, especially with

respect to economic policies of the federal government; c) attitude toward the consequences of thermonuclear war; d) the respondent's desire for shelter protection; e) attitude toward the efficacy of fallout shelters; f) the respondent's expectation of occurrence of war.

These attitudinal items measured by Guttman scales were used as regressors in our regression analysis. Information concerning the signs of the coefficients associated with these regressors are summarized in Table 5E. The column headed "Expected Direction" contains our a priori notion of what the sign of the estimated coefficient should be in each of the equations. In the next two columns, we indicate the number of equations which have a positive coefficient and negative coefficient respectively. The figure in the parentheses refers to the number of coefficients which are statistically significant.

Table 5E

Summary Information About Estimated
Coefficients of Regressors Based on Guttman Scales

Guttman Scale	Expected Direction of Regression Coefficient	# of Equa. with pos. Coefficient	# of Equa. with neg. Coefficient
Bellicosity	?*	3 (2)	5 (3)
Liberal-Conservative	+	8 (3)	0
Consequence	-	2	6 (3)
Desirability	-	0	8 (8)
Efficacy	-	0	8 (6)
Anomie	-	2	6
Likelihood of War	?	4	4 (2)

* A question mark in this column means that there is no obvious reason to expect the sign of a regression coefficient to be in one direction or the other.

In five equations, the bellicosity variable has a negative coefficient. This is interpreted as follows: if the respondent's attitude is less bellicose, he will be less likely to favor the shelter programs. On the other hand, the same variable had the opposite sign in its coefficient in three equations. This suggests that the relationship between bellicosity and attitude probability may be non-linear.

As to the liberal-conservative variable, most equations had a positive coefficient. This indicates that the respondent with a conservative economic philosophy will tend to favor the shelter programs. This may be an indication of a tie-up between economic conservatism and political conservatism. It is a well known fact that pacifist groups, which are usually considered liberal in their political philosophy, are strongly opposed to the construction of shelters in any form. The positive sign in seven out of eight regressions may be interpreted as a manifestation of the above fact.

Six out of eight equations had a negative coefficient associated with the consequence variable. This means that those who consider the consequence of thermonuclear war utterly disastrous will not support the shelter programs whereas those who think a large scale war will not be totally annihilating, especially when adequate shelter protection is available, will naturally favor the shelter construction programs. Therefore, the positive sign in most of the equations is not surprising. It is merely the consequence of a logical proposition.

The same thing may be said about the next two variables, desirability and efficacy. One would expect the respondent who considers shelter protection both desirable and efficacious to endorse the shelter programs. This was exactly the case in each of the eight equations.

The sign of the anomie variable was expected to be negative; i. e., those who believed that they were powerless to do something about protecting themselves and their families against radiation were more likely to be less enthusiastic about the shelter protection. Six out of eight equations had a negative coefficient associated with the anomie variable.

The last variable, expectation of war, measures how imminent the respondent thinks a large scale war is. In four equations, this variable had a positive coefficient and in the remaining four equations it had a negative coefficient. This probably is an indication that the respondent's attitude toward the shelter programs does not primarily depend upon how imminent he thinks thermonuclear war is, but is chiefly influenced by consideration of desirability and efficacy of shelter protection, etc.

F. Predictive Power of Estimated Regressions

One objective of applying regression analysis of this type is to investigate the possible usefulness of estimated regression function as a discriminant function. Therefore, each sample from which a regression function was obtained was analyzed by the following two methods.

Method I.

This is a straightforward application of the notion of discriminant analysis:

(1) The demarcation point, say $\bar{y}$, is calculated as follows:

$$\bar{y} = f(\overline{X}_1, \overline{X}_2, \ldots \overline{X}_{19})$$

where f is the estimated regression function and $\overline{X}$'s are sample means of the independent variables.

(2) Each respondent in the sample is then classified according to whether or not the value of his calculated dependent variable, say $\hat{y}$,

exceeds $\tilde{y}$. If his calculated dependent variable is greater than $\tilde{y}$, he is considered to be in favor of a given shelter program. If it is smaller than $\tilde{y}$, he is not in favor of the shelter program in question.

(3) Each of the above subsamples is further classified according to the respondent's actual attitude toward the shelter. We then have a cross-classification table as follows:

	$\hat{y} \leq \tilde{y}$	$\hat{y} > \tilde{y}$
$y = 0$		
$y = 1$		

We would like to see most of the sample falling into the two main diagonal cells.

Method II

An alternative approach is to compare the actual probability with the calculated probability of the respondent taking a certain stand with respect to a given shelter issue.

(1) Each respondent is classified according to his value of $\hat{y}$ into one of the following categories:

$$\hat{y} \leq 0.1$$
$$0.1 < \hat{y} \leq 0.2$$
$$\vdots$$
$$0.8 < \hat{y} \leq 0.9$$
$$0.9 < \hat{y}$$

(2) Within each category, the proportion of the respondents who were actually in favor of the shelter issue is calculated.

(3) This proportion is then compared with the midpoint of the interval.

Results of applying the first method for testing the predictability of eight regression functions are given in the table below:

Table 5F-1

Predicted and Observed Attitudes of Respondents Toward Shelter Issues

Livermore

Observed Attitudes	Predicted Attitudes											
	Equation L1			Equation L2			Equation L3			Equation L4		
	$\hat{y} < \tilde{y}$	$\hat{y} \geq \tilde{y}$	Total	$\hat{y} < \tilde{y}$	$\hat{y} \geq \tilde{y}$	Total	$\hat{y} < \tilde{y}$	$\hat{y} \geq \tilde{y}$	Total	$\hat{y} < \tilde{y}$	$\hat{y} \geq \tilde{y}$	Total
y = 0	110	38	148	53	7	60	160	115	275	96	49	145
y = 1	55	235	290	83	207	290	42	121	163	52	111	163

Norwalk

Observed Attitudes	Predicted Attitudes											
	Equation N1			Equation N2			Equation N3			Equation N4		
	$\hat{y} < \tilde{y}$	$\hat{y} \geq \tilde{y}$	Total	$\hat{y} < \tilde{y}$	$\hat{y} \geq y$	Total	$\hat{y} < \tilde{y}$	$\hat{y} \geq \tilde{y}$	Total	$\hat{y} < \tilde{y}$	$y \geq \tilde{y}$	Total
y = 0	70	19	89	36	3	39	102	75	177	60	26	86
y = 1	31	128	159	38	121	159	17	54	71	22	49	71

The percentage of correctly grouping those who are in favor of a given shelter program varies from a low of 68 percent in Equation L4 to a high of 81 percent in Equation L1. On the other hand, percentages of correctly grouping those opposing a given shelter program has a larger variability; in Equation L3 it is only 58 percent, whereas, it is as high as 92 percent in Equation N2.

On the basis of these percentages, equations relating to the respondent's attitude toward the community shelter program (L1, L2, N1

and N2) appear to do a better job of predicting than those concerned with private shelter attitude. This is in agreement with what we know about the goodness of fit of each equation to the data based upon various statistics which have already been discussed in the previous section.

Results of applying the second method are presented in Table 5F-2.

Table 5F-2

Predicted and Actual Proportions of Respondents in Favor of Shelter Programs*

Predicted Proportions	Actual Proportions							
	L1	L2	L3	L4	N1	N2	N3	N4
.05	.038	.000	.032	.000	.056	.000	.061	.000
.15	.115	.333	.103	.071	.083	.250	.111	.000
.25	.250	.000	.226	.200	.076	.000	.246	.167
.35	.278	.143	.357	.419	.444	.167	.385	.367
.45	.286	.438	.495	.421	.545	.400	.475	.455
.55	.563	.429	.515	.609	.458	.750	.412	.731
.65	.672	.700	.615	.627	.692	.833	-	.636
.75	.814	.871	.714	.769	.833	.864	-	.667
.85	.868	.927	-	.727	.897	.971	-	.400
.95	.956	.987	1.000	1.000	.930	.978	-	1.000
r	.984	.935	.993	.981	.978	.943	.941	.866

*The cell with the observed proportion of 0.000 contained some respondents; however, no respondent was in favor of the shelter program. The cell with a dash (-) indicates that no respondent was in the cell.

In the last row of Table 5F-2, a simple correlation coefficient of predicted proportions and observed proportions is given. This may be used as a basis for determining which equation is most useful for the purpose of prediction. With the exception of N4, the rest of the equations may be considered to have predicted actual proportions with a fair degree of accuracy.

VI. SUMMARY AND DISCUSSION

The major findings reported in previous sections are summarized and their implications to civil defense programs are discussed in this section.

In the course of our study, information on the structure of community leadership in Livermore and Norwalk was obtained. Our primary interest was to observe the actions or participation of the leaders in the two communities on the fallout shelter issue in order to gain insight into the process of community decision-making on this matter.

It was observed that in both communities those who were either actively promoting or opposing the construction of community shelters do not belong to a group of so-called top leaders who are usually active in community affairs. In fact, most of the top community leaders declined to take sides on the issue. This was especially true in the case of Livermore.

As has been noted, the shelter programs in both communities are now in a "dormant" stage. It is felt that one important reason for such an unpromising development was a lack of support from the key community leaders coupled with relative inexperience in community leadership of those promoting the programs.

Perhaps the reluctance of the community leaders to become seriously involved in the shelter issue is due to the fact that the nature of the issue is entirely different from that of the customary community programs such as Red Cross drives and hospital fund campaigns; the fallout shelter question is still a hotly debated and controversial issue, and most of the community leaders probably are not in possession of sufficient technical knowledge to render a judicious opinion on the matter. It is also interesting to note that most pro-shelter "issue" leaders were either scientists

or engineers who are well-informed about nuclear weapons systems and their effect as well as matters related to civil defense measures.

These findings have some interesting implications with regard to the OCD programs. It appears that a successful campaign for community shelter programs needs active participation and favorable action on the part of the top community leaders. This means that there should be a line of communication between these important people of the community and OCD. They should be supplied with technical information relating to civil defense measures. Once they become well informed, perhaps they will also become issue leaders as have some of the scientists and engineers in Livermore. Finally, the shelter issue may be of such a controversial nature that it will require federal effort, rather than merely local programs, to efficiently resolve it.

There were some minor differences between the two communities with respect to their response pattern regarding the question of the fallout shelter issue. However, as shown in Table 4B-4, there were more similarities than differences. Regional peculiarities of both communities are probably overshadowed by the fact that they are both in the proximity of prime target areas.

In both communities, nearly two-thirds of sample members stated that they favor the construction of community shelters. It should be cautioned, however, that voicing support for a certain issue is not equivalent to taking necessary action to resolve the issue. The idea of the government encouraging private individuals to build their own shelters did not seem to have much appeal.

When international tensions mount, they create a great deal of anxiety among a sufficiently large portion of the populace; consequently, the public attitude toward the shelter issue will be expected to change. This was observed right after the Cuban crisis. There was an increase of about 10 percent in the proportion of people favoring some type of shelter program.

A number of contingency tables were formulated to investigate relationships between some demographic variables and attitude toward the shelter issue. The χ^2 test was applied whenever data met the requirements and results are summarized below.

Table 6

Significance Levels of Chi-square Statistics Pertaining to Various Demographic Variables and Attitudes Toward the Shelter Issue

Demographic Variable	Livermore		Norwalk	
	Attitude on C. S.	Attitude on P. S.	Attitude on C. S.	Attitude on P. S.
Age	0.5%	10.0%	No χ^2 test	No χ^2 test
Sex	2.5	0.5	40.0%	5.0%
Religion	20.0	50.0	No χ^2 test	No χ^2 test
Socio-Economic level	- *	10.0	No χ^2 test	No χ^2 test
Education Level	30.0	-	-	10.0
Children	1.0	40.0	5.0	-
Years of Residence in Community	10.0	-	No χ^2 test	No χ^2 test
Home Owner vs. Renter	-	1.0	2.5	20.0
White Collar vs. Blue Collar	20.0	5.0	10.0	-

* - indicates that the significance level exceeds 50%.

Judging from the significance levels shown in Table 6, the following demographic variables appeared to be most significantly related to attitudes on the shelter issue: age, sex, and white collar vs. blue collar.

In Norwalk, the level of participation in organization activities seemed to affect one's thinking toward the shelter issue; there was not sufficient evidence to indicate that this was the case in Livermore.

In Livermore each member of the sample was asked a set of questions which was designed to measure the impact of various communication media upon the fallout shelter issue. Among various communication media, magazines, newspapers and talking with people appeared to be most significantly related to one's thinking on the shelter issue.

The possible associations between the respondent's attitudes on various items concerning the general problems of the cold war and some important demographic variables were investigated. It should be noted that the information and opinion statements about the attitudinal items were combined into an ordinal measurement scale by means of the Guttman scalogram analysis. Scores thus obtained were correlated with observations on the demographic variables to examine whether or not there is a statistically significant relationship.

It was found that men were more likely to be less optimistic about consequences of thermonuclear war. People with higher education were less likely to favor a hard-line approach in dealing with foreign antagonists; they were also less likely to have a feeling of powerlessness or anomie. Education level was not related to the respondent's beliefs concerning utility of shelters nor to his opinion about the likelihood and timing of war.

It was also found that the older the respondent, the more bellicose he was toward foreign antagonists and the more skeptical he was about the usefulness of shelters. We also found that those respondents with children still at home tended to place a high value on the utility of shelters.

Some of the findings reported above are not particularly surprising. Yet they do provide sufficient evidence for us to believe that some aspects of public opinion and knowledge are not unstructured as they might appear on the surface. In fact, they can be measured by a certain type of ordinal scale measurement instrument such as the Guttman scalogram analysis.

Encouraged with the scalability of the aforementioned items, we developed several experimental prediction models with moderate success. The primary purpose of these models was to predict a person's attitude toward the shelter issue given his Guttman scores on certain other related behavioral items and his values of some important demographic variables.

An individual's attitude toward the fallout shelter issue is motivated by many factors. A successful prediction of his attitude requires a knowledge of all the major relevant factors as well as the direction and magnitude of their influences. Our study identified some important factors which have strong association with attitude toward shelter issues.

Perhaps the two most significant factors were the following attitudinal items which were measured by the Guttman scale: 1) beliefs as to consequences of thermonuclear war; 2) beliefs as to efficacy of fallout shelters for life protection. It was found that if the respondent believed that a large-scale nuclear war would not be totally annihilating and also believed in the efficacy of shelters in protection of life in the event of

such a war, he would tend to support the shelter construction programs. One obvious implication of this finding is that an education or communication program designed to supply more accurate knowledge about the consequences of thermonuclear war and the utility of fallout shelters will result in an increased support of shelter programs.

However, a number of factors used as regressors were found to be statistically not significant. It is obvious that we still have a long way to go before we attain a workable knowledge about the opinion-forming process of an individual with respect to a complex issue such as fallout shelter programs. Nevertheless, some prediction equations derived in this study, especially those relating to community shelter attitude, are useful as the first step toward the attainment of a more accurate and reliable prediction equation to determine public opinion with regard to shelter issues in particular and to problems of war and peace in general.

With respect to statistical methods, an alternative approach based on different (and more realistic) specifications of the statistical universe should be considered. This will require some theoretical work in statistics.

Since the data used in our study came from two communities which cannot be considered to be representative of the entire nation, we cannot extend the use of the estimated prediction equations beyond the boundaries of these two communities. We can, however, consider an application of the approach delineated in Section V to data obtained on a national scale. We feel that further investigation in this direction will yield more fruitful results.

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APPENDIX A. SAMPLING PROCEDURE

1. Sampling Plan for Livermore Study

Livermore has a population of about 16, 000 people and about 5, 200 households. Since a sample of 250 to 300 households was desired, a sampling rate of about 1-in-20 was needed.

No "block statistics" were available for Livermore. Nor was a city directory available. (One became available around January 1, 1963.) In order to obtain, within reasonable cost, some information on how the households are distributed over the blocks, aerial photographs covering the town were purchased. Because they were not available when the sample of blocks was needed, the block size data from the photos were used in estimation rather than in the block selection phase of the sample design.

On a street outline map of the town, the tract boundaries used in the 1960 census were identified and marked. The three tracts, LI-0018, LI-0019, and LI-0020 covered nearly all of the incorporated area except for a small piece of an industrial area and, in addition, they included the area immediately surrounding the incorporated area. The three tracts have an aggregate population of 17, 665 as compared to 16, 058 in the incorporated territory. The 3 tracts, therefore, constituted a convenient and suitable general frame of the community for this study. It also appeared that the tracts performed a useful function as primary strata since LI-0018 was a wholly newly-built area whereas LI-0019 and LI-0020 consisted of both new and old portions which could be easily distinguished.

The blocks within each tract were numbered serially in a manner such that the most "alike" blocks (in geography and "newness") were kept together in the numbering sequences. Using random start numbers, a

1-in-4 sample of blocks was selected from each tract. The block sample, therefore, consisted of 73 of the 292 blocks in the frame which were distributed over the tracts as shown below:

Census Tract	No. of Blocks In Frame	In Sample	Expected Households Per Block
LI-0018	55	14	24.3
LI-0019	91	23	21.8
LI-0020	146	36	13.0
The Town	292	73	17.9

It will be noted that the average block in Tracts 18 and 19 contain about 23 households but the average in Tract 20 was only about half as much or 13. This was due, in part at least, to the fact that Tract 20 contained the commercial area.

The 73 sample blocks contained about 1300 households. Using a sample rate of 1-in-5, a sample of about 260 homes was obtained. The sample homes were selected by listing each street address (or other identification) on each sample block starting in the northeast corner and listing clockwise around each block, numbering each serially. Every home with a number ending in a "0" or "5" became a sample home. (Special instructions were given for numbering households in multi-household structures.)

Out of the 73 blocks selected, 66 of them were designated for one interview per sample home. In order to obtain an unbiased selection of the sample spouse when more than one existed in a house, each interviewer kept, in the order of visit, a record of the spouses living in each sample home visited. Each spouse was listed in the following manner.

Home No.	Name	Spouses	In Sample
5	Smith	Mr. Mrs.	X
10	Jones	Miss	X
15	Black	Mr. Mrs.	X
20	White	Mr.	X
25	Blue	Mrs.	

In singleton homes, the one and only eligible respondent was interviewed. In doubleton homes the interviewer alternated the selection of spouse - husband in one, wife in the next, husband in the next, etc. In no case was it permissible to alter the order because one spouse was more accessible or agreeable than the other.

In the seven special blocks, if the sample home was a doubleton household, both spouses were required. (This information was used to measure degree of homogeneity of opinion between spouses in the same home which appeared to be useful not only for this study but for planning similar surveys in the future as well.)

2. Norwalk Sampling Plan

According to the 1960 Census, Norwalk had 21,467 total housing units; 20,315 occupied housing units; 20 census tracts and 752 blocks. Specifying a sample of about 250-300 households with 3 households per block, a sampling rate for block selection of about 1-in-200 homes was suggested. Hence, about 100 of the blocks, and 3 homes from each of these blocks, were selected.

Selecting Sample Blocks

Using the data in the Census Block Statistics Report, cumulative totals of total housing units by block were prepared on paper tape and, with a random start number of x, the blocks containing the xth, x + yth, x + 2yth, etc., housing unit were designated for the sample, where y was tied to the sampling rate.

It will be noted that since the Census had numbered the tracts within the city, and the blocks within each tract, in a serpentine manner, it followed that geographic scatter of the sample blocks was essentially maximized. In order to assure a sufficiency of eligible households in each sample block, when a selected block contained fewer than 10 total housing units (1960 Census), it was combined with the block with the next highest number and the combined blocks were treated as a single sample block. Also, some blocks contained such a large number of housing units that they appeared in the sample twice. This meant in effect that six, rather than three, sample households were normally expected in these blocks. This was the case for three of the blocks selected.

APPENDIX B. SEVEN SOCIO-ECONOMIC SCALE POSITIONS

Each respondent's occupation was classified into one of the following seven groups:

1. Higher Executives of Large Concerns, Proprietors, and Major Professionals

   a. Higher Executives: (Value of corporation $500,000 and above as Rated by Dunn and Bradstreet.)

      Bank Presidents; Vice-Presidents; and Assistant Vice-Presidents

      Businesses -- Directors, Presidents, Vice-Presidents, Assistant Vice-Presidents, Executive Secretaries, Research Directors, Treasurers, Regional or Div. Mgr., large corps.

   b. Proprietors: (Value over $125,000 by Dunn and Bradstreet.)

      Brokers
      Contractors
      Dairy Owners
      Farmers
      Lumber Dealers

   c. Major Professionals:

      Accountants (C. P. A.)
      Actuaries
      Agronomists
      Architects
      Artists, Portrait
      Astronomers
      Auditors
      Bacteriologists
      Chemical Engineers
      Chemists
      Clergymen (Professionally Trained)
      Dentists
      Economists
      Engineers (College Grad.)
      Foresters
      Geologists
      High School Principals
      Judges (Superior Courts)
      Lawyers
      Metallurgists
      Military, Comm Officers, Major and above, Officials of the Executive Branch of Government, Federal, State, Local; e. g., Mayor, City Manager, City Plan Director, Internal Revenue Directors.
      Physicians
      Physicists, Research
      Psychologists, Practicing
      School Superintendents
      Symphony Conductor
      Teachers, University, College
      Veterinarians (Veterinary Surgeons)

2. Business Managers, Proprietors of Medium Sized Businesses, and Lesser Professionals

a. Business Managers in Large Concerns: (Value $500,000 plus)

Advertising Directors
Branch Managers
Brokerage Salesmen
Directors of Purchasing
District Managers
Executive Assistants
Export Managers, Int. Concern
Farm Managers
Govt. Officials, Minor, e.g., Internal Revenue Agents
Grade School Prinicpals
Manufacturer's Representatives
Office Managers
Personnel Managers
Police Chief; Sheriff
Postmaster
Production Managers
Sales Engineers
Sales Managers, National Concerns
Store Managers

b. Proprietors of Medium Businesses: (Value $50,000 to $125,000)

Advertising
Clothing Store
Contractors
Express Company
Farm Owners
Fruits, Wholesale
Furniture Business
Jewelers
Poultry Business
Real Estate Brokers
Rug Business
Store
Theater

c. Lesser Professionals

Accountants
Airline Pilots -- major airlines
Chiropodists
Correction Officers
Director of Community House
Engineers (not College Grad.)
Finance Writers
Health Educators
Labor Relations Consultants
Librarians
Military, Comm. Officers, Lts., Captains
Musicians (Symphony Orchestra)
Nurses
Opticians
Pharmacists
Public Health Officers (M.P.H.)
Research Assistants, Univ. (Full Time)
Social Workers
Teachers, Elementary and High

3. Administrative Personnel, Owners Small Businesses, and Minor Professionals

a. Administrative Personnel

Advertising Agents
Chief Clerks
Credit Managers
Insurance Agents
Managers, Departments
Passenger Agents -- R.R.

Private Secretaires
Purchasing Agents
Sales Representatives (e. g., car salesmen)
Section Heads, Federal, State, and Local Governmental Offices
Section Heads, Large Businesses and Industries
Service Managers
Shop Managers
Store Managers (Chain)
Traffic Managers

b. Small Business Owners: (Value $10, 000 to $50, 000)

Art Gallery
Auto Accessories
Awnings
Bakery
Beauty Shop
Boatyard
Brokerage, Insurance
Car Dealers
Cigarette Machines
Cleaning Shops
Clothing
Coal Businesses
Contracting Businesses
Convalescent Homes
Decorating
Dog Supplies
Dry Goods
Engraving Businesses
Food
Finance Co., Local
Fire Extinguishers
5¢ and 10¢ Stores
Florist
Food Equipment
Food Products
Foundry
Funeral Directors
Furniture
Garage
Gas Station
Glassware
Grocery-General
Hotel Proprietors
Jewelry
Machinery Brokers
Manufacturing
Monuments
Music
Package Store (Liquor)
Paint Contracting
Plumbing
Poultry
Real Estate
Records and Radios
Restaurant
Roofing Contractor
Shoe
Signs
Tavern
Taxi Company
Tire Shop
Trucking
Trucks and Tractors
Upholstery
Wholesale Outlets
Window Shades

c. Semi-Professionals

Actors and Showmen
Army M/Sgt.; Navy C. P. O.
Artists, Commercial
Appraisers (Estimators)
Clergymen (not professionally trained)
Concern Managers
Deputy Sheriffs
Dispatchers, R. R.
Interior Decorators
Interpreters, Court
Laboratory Assistants
Landscape Planners
Morticians
Oral Hygienists
Photographers
Physio-therapists
Piano Teachers
Publicity and Public Relations
Radio, T. V. Announcers

Reporters, Court
Reporters, Newspapers
Surveyors
Title Searchers
Tool Designers
Travel Agents
Yard Masters, R.R.

d. Farmers

Farm Owners ($20,000 - $50,000)

4. Clerical and Sales Workers, Technicians, and Owners of Little Businesses (Value under $10,000)

a. Clerical and Sales Workers

Bank Clerks and Tellers
Bill Collectors
Bookkeepers
Business Machine Operators, Offices
Claims Examiners
Clerical or Stenographic
Conductors, R.R.
Employment Interviewers
Factory Storekeepers
Factory Supervisors
Post Office Clerks
Route Managers
Sales Clerks
Sergeants and Petty Officers, Military Services
Shipping Clerks
Supervisors, Utilities, Factories
Toll Station Supervisors
Warehouse Clerks

b. Technicians

Dental Technicians
Draftsmen
Driving Teachers
Expeditor, Factory
Experimental Tester
Instructors, Telephone Co., Factory
Inspectors, Weights, Sanitary Inspectors, R.R., Factory
Investigators
Laboratory Technicians
Locomotive Engineers
Operators, P.B.X.
Proofreaders
Safety Supervisors
Supervisors of Maintenance
Technical Assistants
Telephone Co. Supervisors
Timekeepers
Tower Operators, R.R.
Truck Dispatchers
Window Trimmers (Store)

c. Owners of Little Businesses: ($5,000 to $10,000)

Flower Shop
Grocery
Newsstand
Tailor Shop

d. Farmers

Owners ($10,000 - $20,000)

5. Skilled Manual Employees

Auto Body Repairers
Bakers
Barbers
Blacksmiths
Bookbinders
Boilermakers
Brakemen, R. R.
Brewers
Bulldozer Operators
Butchers
Cabinet Makers
Cable Splicers
Carpenters
Casters (Founders)
Cement Finishers
Cheese Makers
Chefs
Compositors
Diemakers
Diesel Engine Repair and Maintenance (trained)
Diesel Shovel Operators
Electricians
Engravers
Exterminators
Fitters, Gas, Steam
Firemen, City
Firemen, R. R.
Foremen, Construction, Dairy
Gardners, Landscape (trained)
Glass Blowers
Glaziers
Gunsmiths
Gauge Makers
Hair Stylists
Heat Treaters
Horticulturists
Linesmen, Utility
Linotype Operators
Lithographers
Locksmiths
Loom Fixers
Machinists (trained)
Maintenance Foremen
Linoleum Layers
Masons
Masseurs
Mechanics (trained)
Millwrights
Moulders (trained)
Painters
Paperhangers
Patrolmen, R. R.
Pattern and Model Makers
Piano Builders
Piano Tuners
Plumbers
Policemen, City
Postmen
Printers
Radio, T. V. Maintenance
Repairmen, Home Appliances
Rope Splicers
Sheetmetal Workers (trained)
Shipsmiths
Shoe Repairmen (trained)
Stationary Engineers (Licenses)
Stewards, Club
Switchmen, R. R.
Tailors (trained)
Teletype Operators
Tool Makers
Track Supervisors, R. R.
Tractor-Trailer Trans.
Typographers
Upholsterers (trained)
Watchmakers
Weavers
Welders
Yard Supervisors, R. R.

Small Farmers

Owners (under $10, 000)
Tenants who own farm equipment

6. Machine Operators and Semi-Skilled Employees

Aides, Hospital
Apprentices, Electricians, Printers, Steam Fitters, Toolmakers
Assembly Line Workers
Bartenders
Bingo Tenders
Bridge Tenders
Building Superintendents (Cust.)
Bus Drivers)
Checkers
Coin Machine Fillers
Cooks, Short Order
Delivery Men
Dressmakers, Machine
Elevator Operators
Enlisted Men, Military Services
Filers, Benders, Buffers
Foundry Workers
Garage and Gas Station Assistants
Greenhouse Workers
Guards, Doorkeepers, Watchmen
Hairdressers
Housekeepers
Meat Cutters and Packers
Meter Readers
Operators, Factory Machines
Oilers, R. R.
Practical Nurses
Pressers, Clothing
Pump Operators
Receivers and Checkers
Roofers
Set-up-Men, Factories
Shapers
Signalmen, R. R.
Solderers, Factory
Sprayers, Paint
Steelworkers (not skilled)
Stranders, Wire Machines
Strippers, Rubber Factory
Taxi Drivers
Testers
Timers
Tire Moulders
Trainmen, R. R.
Truck Drivers, General
Waiters-Waitresses ("Better Places")
Weighers
Welders, Spot
Winders, Machine
Wiredrawers, Machine
Wine Bottlers
Wood Workers, Machine
Wrapers, Stores and Factories

Farmers

Smaller Tenants who own little equipment

7. Unskilled Employees

Amusement Park Workers (Bowling Alleys, Pool Rooms)
Ash Removers
Attendents, Parking Lots
Cafeteria Workers
Car Cleaners, R. R.
Carriers, Coal
Countermen
Dairy Workers
Deck Hands
Domestics
Farm Helpers
Fishermen (Clam Diggers)
Freight Handlers
Garbage Collectors
Grave Diggers
Hod Carriers
Hog Killers
Hospital Workers, Unspecified
Hostlers, R. R.

Janitors (Sweepers)
Laborers, Construction
Laborers, Unspecified
Laundry Workers
Messengers
Platform Men, R. R.
Peddlers
Porters
Relief, Public, Private
Roofer's Helpers
Shirt Folders
Shoe Shiners
Sorters, Rag and Salvage
State Hands
Stevedores
Stock Handlers
Street Cleaners
Struckmen, R. R.
Unemployed (no occupation)
Unskilled Factory workers
Waitresses - "Hash Houses"
Washers, Cars
Window Cleaners
Woodchoppers

Farmers

Share Croppers