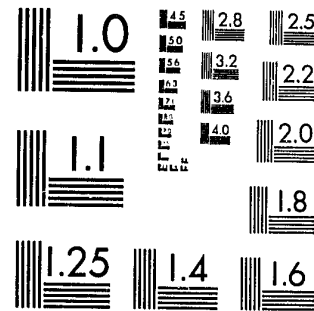


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MEASURING FEAR OF CRIME: A RECOMMENDED SET OF SCALES

(User's Manual)

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SUMMARY

"Fear of Crime" has been established as an important aspect of the crime problem in America, as it has received considerable attention by politicians, public administrators, the press, researchers and others interested in the consequences of crime. However, our understanding of what constitutes fear of crime and how it should be measured has remained quite limited. All-too-often, survey questions about fear of crime are not derived from any theoretical understanding of the phenomenon and are not subject to any rigorous evaluation or validation procedures.

Given these limitations on what we know about fear of crime, the Office of Research and Evaluation Methods, National Institute of Justice, funded a research project to advance the state-of-the-art in measuring fear of crime. In the present report, some of the major findings of this research are summarized for the benefit of criminal justice researchers, program evaluators, and program managers.

This methodological research related in the development and validation of a new set of scales for measuring fear-related constructs. The conceptual framework used to guide this research was provided by Lazarus' (1966) stress theory. The stress model was easily applied to the fear of crime literature and was able to clarify the distinctiveness and interrelatedness of the various dimensions of fear of crime.

The stress model posits three basic elements of a stress situation, and for each of these elements, a corresponding dimension of fear of crime was identified. The first element of a stress situation is the perceived set of stimulus conditions. Correspondingly, a three-item Perceptions of Crime scale was constructed and validated as a nonevaluative index of perceptions about the

nature and extent of crime in the local environment.

The second element of a stress situation is an assessment or appraisal of the threat provided by the stimulus conditions. Thus, according to the model, crime is a potential environmental stressor, depending on how it is assessed or interpreted by the individual. Corresponding to the second element, a four-item Concern for Personal Safety scale was constructed and validated as an affective index of the extent to which the individual has defined or interpreted the situation as a threat to his/her own safety. More specifically, this scale seems to measure the individual's fear of being victimized by "street crimes," especially robbery and assault.

The third element of a stress situation is comprised of coping responses aimed at reducing the threat. In the present research, actions which people take to protect themselves or their property were defined as coping responses to reduce the threat of victimization. In the final analysis, a three-item Avoidance of Street Crime scale was constructed and validated as a frequency measure of personal behaviors directed at protecting oneself from victimization by "street crime."

The above-mentioned scales were constructed and refined using conventional analytic techniques, such as factor analysis and tests of internal consistency. Thus, unidimensional indices with known reliabilities were established. These indices were then subject to additional tests for temporal stability (test-retest reliability), and various tests of validity. The data strongly indicate that these scales are unidimensional, internally consistent, reliable over time, and, generally valid as indicators of the fear-related constructs under study.

The methodological research went beyond the construction and validation of multi-item indices. A magnitude estimation study was conducted to generate ratio-scaled response formats to accompany these fear items. With a ratio scale,

the distances between the points on the scale are known and the scale contains an absolute zero point. Ratio scales were developed for two types of adverb modifiers commonly used in fear of crime research -- those which modify the intensity of expressions and those which modify the frequency of expressions. A four-point intensity scale ("Not at all," "somewhat," "quite," and "very") was constructed for use with affective and cognitive items concerning the personal threat of crime (e.g., items addressed to the respondent's fear or perceived risk of victimization). A four-point frequency scale ("Never," "sometimes," "quite often," and "always") was constructed for use with items concerning protective behaviors and judgments about the extent of the local crime problem. These two scales are recommended because they: approximate the properties of a ratio scale; have an optimum number of response alternatives (as defined by both practical and statistical concerns); and are stable across different respondents and other variables.

Hopefully, the scale construction and validation strategies utilized in this research will encourage others to think more about measurement issues, discourage the common reliance of single-item measures, and perhaps contribute to the standardization of measurement in this field.

I. INTRODUCTION: THE "FEAR OF CRIME" MEASUREMENT PROBLEM

"Fear of crime" is a phrase that now represents a major facet of the crime problem in the United States. This phrase has been exploited by politicians, the mass media, and the citizenry to describe one of the major consequences of crime in this country. In addition, fear of crime has been the primary focus of government-funded research on "reactions to crime" (see Dubow, McCabe, & Kaplan, 1978), and a major focus of crime prevention programs (e.g., Fowler, McCalla, & Mangione, 1979; McPherson & Silloway, 1980).

Given this level of attention, one might expect to find substantial agreement regarding what constitutes fear of crime and how it should be measured. Unfortunately, this is not the case. The conceptualization of fear of crime has been taken for granted by most researchers and nonresearchers alike. Furthermore, the literature is cluttered with a multitude of measures and contains almost no information for possible users as to which are the more reliable and valid indicators of fear of crime.

In light of these knowledge limitations, the Office of Research and Evaluation Methods of the National Institute of Justice, Department of Justice, has funded a research project to advance the state-of-the-art in measuring fear of crime. This project, directed by the present authors, resulted in the development and validation of a new set of scales for measuring fear-related constructs. The primary purpose of the present report is to share some of the major findings with criminal justice researchers, evaluators, and program managers. In this report, specific sets of questions (i.e., scales) and specific response formats designed to measure fear of crime are presented and discussed in a relatively nontechnical manner. Although some

technical information is provided in the text and the appendices, the reader interested in the detailed analyses is referred to the project's Interim Report (Rosenbaum & Baumer, 1980) and Final Report (Baumer & Rosenbaum, 1981).

Before describing our procedures, findings, and recommendations, we will first address the reader who is grappling with one or both of the following questions: (1) "Why do we need new measures of fear of crime--what is wrong with the existing measures?"; (2) "To whom is this report directed and why is measurement so important to these audiences?" In the remainder of this introductory chapter, we shall briefly respond to these questions so as to aid potential users in assessing the utility of this report for themselves and also to set the stage for the results and recommendations which follow.

The problem with existing measures. First, there is the question of what is wrong with the existing measures. Perhaps the best answer is that we don't really know what is wrong with most of them because they have not been seriously evaluated. In practice, survey questions about fear of crime are often created "on the spot" to serve local research needs, with little consideration given to theoretical questions, prior research results, or conventional procedures for item development and scale construction. In addition to the need for better conceptualization and operationalization of measures in this area, the third critical element in the measurement process, and the one which has been most seriously neglected, is the evaluation or validation of existing measures. Everyone seems interested in creating their own items and then assuming that these items measure something called fear of crime. The consequence of this practice is that we are left with a wide variety of questions and response alternatives designed to measure fear

of crime (see Baumer, 1978; Dubow, et al., 1978; Rosenbaum & Baumer, 1980), and very little knowledge about the reliability or validity of these numerous items. This approach to measurement, characterized by lack of standardization, has resulted in little cumulative knowledge and a patchwork understanding of the phenomenon under study.

Our limited knowledge of how to measure fear of crime, and the consequences of this ignorance, were illustrated in the recent debate over the Figgie Report--a national study of the extent and impact of fear of crime in America (see Criminal Justice Newsletter, Vol. II, No. 22, Nov. 10, 1980 for the debate). The major findings of the Figgie Report (Research & Forecasts, 1980) have been widely disseminated, including significant coverage in the Chicago Tribune, the New York Times, and U. S. News and World Report. However, Lavrakas, Lewis, & Skogan (1980) have severely criticized the Figgie Report, stating that it "misrepresents both the level and impact of fear of crime in America" (p. 3). After criticizing the study's sampling procedures, the authors proceed to argue that it "measures fear of crime in a manner which casts even greater doubt on the validity of the findings" (p. 4). Without discussing the specifics of the Figgie debate, the importance of measurement issues should be apparent from this example. Because "fear of crime" easily becomes a "buzz" phrase for politicians and media sources, researchers have an added responsibility to make sure that people are referring to the same phenomenon and that the phenomenon can be objectively measured. We must ask ourselves soberly--Do we have the measures necessary to answer such questions as--How afraid is America?

The measurement problem lies not only with the survey questions, themselves, but also with the various answers or response options that are

considered acceptable. When asked about personal safety, for example, what does the respondent mean when he/she reports feeling "reasonably safe" instead of "very safe?" What is the quantitative difference? How does "somewhat afraid" differ from "rather afraid?" Does "somewhat safe" mean something different than "somewhat afraid?" In general, the questions of interest are-- (1) how do certain adverb modifiers (e.g., "somewhat," "reasonably," "very") actually modify the meaning of fear-related adjectives? and (2) do these modifiers (also referred to as "quantifiers" or "intensifiers") have the same meaning for different people and across different word contexts? An attempt must be made to quantify these vague modifiers.

Survey researchers in general have given almost no attention to response formats and the important decision of choosing the most appropriate adjectives and adverb modifiers. In the fear of crime literature, the variety of response scales and lack of reported justifications tells the story as to how they were constructed. In the absence of empirical justification, the selected adverb modifiers are usually assumed to provide equal intervals between the categories, but this has yet to be tested. Furthermore, the entire response scale sometimes reflects a possible confusion of dimensions. For example, some studies have used scales which range from "very safe" at one end to "very unsafe," "very fearful," or "very dangerous" at the other end. Others have used scales that range from "very concerned" to "not at all worried."

Another problem with response formats in the fear of crime literature is the reliance on the simple "yes-no" option, especially when measuring protective behaviors. This type of forced option severely restricts the response variance and, therefore, limits the amount of information that can be

obtained from any one question. Certainly, researchers can do better than a yes-no format if they are interested in the frequency or intensity of feelings and behaviors related to the threat of criminal victimization.

As suggested above, we maintain that most of the problems with either survey questions or response formats can be traced to a lack of attention to both conceptual and operational issues. In particular, the basic questions that have been addressed too infrequently include:

- What do we really mean by "fear of crime?"
- How many dimensions are needed to conceptualize the phenomenon?
- What are the "best" response scales for quantifying the meaning of answers to survey questions about fear of crime?
- What is a good measurement strategy for constructing items, multi-item indices, and response scales?
- What evidence exists or can be collected to evaluate the items, indices, and response scales of interest?

In terms of conceptual problems, the diversity of existing measures best illustrates the conceptual ambiguities that prohibit a clear definition of fear of crime. The phrase "fear of crime" has not been clearly defined in either popular or scientific usage. Previous attempts to conceptualize this area (Baumer, 1979; Dubow, et al., 1978; Furstenberg, 1971; Fowler & Mangione, 1974) have been few in number and have yet to offer a convincing conceptualization of the phenomenon. We hope that our work in this area will shed some additional light on the problem.

Finally, the state-of-the-art in operationalization and evaluation reflects some advancement of knowledge. In terms of validation, recent progress has been made toward evaluating the adequacy of selected measures, but much work has yet to be undertaken. Measurement evaluation should focus on questions of reliability and validity. Aside from a few factor-analytic studies (Baumer,

1979; Normoyle, 1980), there has been little work on the validity of selected scales or items, other than concern over face validity. In terms of reliability, a few scales have been assessed for internal consistency (Baumer, 1980; Normoyle, 1980; Lavrakas, 1979), and only one study has looked at test-retest reliability (Bielby & Berk, 1979). Of course, the reader is reminded that reliability is a necessary, but insufficient condition for validity. As noted earlier, we are still faced with many validity questions about the nature of fear of crime, especially its dimensionality.

In terms of response scales, we are familiar with no scaling or magnitude estimation studies that deal with fear of crime measures. While there have been a few studies that apply magnitude estimation/ratio scaling procedures to social variables (see Bass, Cascio, & O'Connor, 1974; Bradburn & Miles, 1979; Lodge, Cross, Tursky, & Tanenhaus, 1975; Stevens, 1975), to our knowledge, the only magnitude estimation research that deals with crime has focused on the scaling of offense seriousness (e.g., Sellin & Wolfgang, 1964). Fear of crime measures have yet to be properly scaled, particularly those which attempt to measure the intensity or frequency of various fear-related reactions to crime. Therefore, we conducted a magnitude estimation study to help fill this void, and the results are summarized in this report. A study of this nature, dealing specifically with fear of crime, was needed because previous research has demonstrated that the effects of adverb modifiers are not invariant across subject matter, as measurement specialists would like to believe (see Bradburn & Miles, 1979).

Audience for this report. The next question is: To whom is this report directed and why is measurement important to these audiences? First, we hope that researchers interested in fear of crime will benefit from our

recommendations. In recent years, numerous studies have been conducted on fear of crime (see Dubow, et al., 1978; Baumer, 1978; Skogan & Maxfield, 1981). The primary objective of this sizable literature has been to identify correlates of fear of crime. Meanwhile, the adequacy of the measures themselves has been taken for granted. The importance of a solid measurement foundation is becoming more apparent to researchers as they become more involved in model-building and as the number of contradictory or nonsupportive findings increases. Theories and hypotheses regarding the causes and consequences of fear of crime cannot be rigorously examined if measures of the fear construct are suspect. Unfortunately, when researchers assume that their measures are reliable and valid, they typically look for other (i.e., non-measurement) explanations to account for contradictory or inconsistent results, and this may amount to looking in the wrong direction. We firmly believe that empirical efforts to build sound causal models in this topic area will enjoy greater success when a more rigorous approach to measurement is employed. In addition to answering questions about the nature and extent of fear both locally and nationally, measures having known reliability and validity can advance our understanding of how fear is affected by demographic characteristics, victimization history, mediating cognitive variables, neighborhood characteristics, actual crime rates, and other individual and contextual variables. Moreover, our knowledge base regarding the consequences of fear of crime for specific individuals and neighborhoods will be significantly expanded.

The scales recommended in this report are not a panacea for researchers, but can be viewed as a step in the direction of improving measurement. If these scales can stimulate researchers to think more about measurement issues,

discourage the common single-item strategy, and perhaps contribute to the standardization of measurement, then the efforts reflected in this report were not in vain.

A second target group for this report is individuals and agencies interested in the development and/or evaluation of programs which deal directly or indirectly with crime control. This group may include funding agencies, project staff, project evaluators, and others who feel that programs must address the fear of crime problem. For example, the Law Enforcement Assistance Administration's dual goal for crime prevention programs was "to prevent crime and decrease the fear of crime" (LEAA, 1978; emphasis added). Community crime prevention programs, whether supported by federal, state, or local funds, have flourished during the 1970's and, although federal funds are "drying up," similar programs can be expected to maintain strong grass roots support during the 1980's. The Law Enforcement Assistance Administration, the Department of Housing and Urban Development, ACTION, and other federal agencies have planted the seeds of citizen crime prevention in recent years.

Fear of crime measures can be very important for both program planning and evaluation. In terms of program planning, the call for empirical, research-based definitions of the problem has never been stronger. Well-planned crime prevention programs are likely to involve an up-front needs assessment survey to identify the amount and geographic distribution of fear of crime (e.g., Fowler, McCalla, & Mangione, 1979; McPherson & Silloway, 1980). This information can be studied in relationship to the actual incidents of crime, availability of resources, and other variables used in the planning process. With even greater frequency, measures of fear or perceived safety have been employed by those interested in evaluating the impact of crime prevention/

control programs (Yin, 1978). Indicators of fear have been used for programs aimed at community renewal, commercial revitalization, or high vulnerability groups.

Recently, measures of fear have taken on greater importance for program planners and evaluators as they begin to recognize that (1) the actual rates of crime may not be as controllable as fear of crime, (2) measuring changes in crime (victimization) rates can be methodologically troublesome and costly, and (3) fear of crime is sufficiently widespread that many people view it as a greater social problem than the actual victimization problem (Wilson, 1976). As Skogan & Maxfield (1981) have pointed out, the number of fearful citizens is much larger than the number of victimized citizens. Thus, fear of crime has been taken seriously by many crime control programs because citizens may be more fearful than need be, especially if programs are effective in controlling crime at the neighborhood level. Maltz (1974) defined the importance of fear to these programs when he stated that "unless the public feels safer in proportion to its increased actual safety, the full 'potential' of an effective crime control program will not have been reached" (p. 41).

Although community crime prevention/control programs are often expected to decrease fear of crime along with specific crime rates, there is also a strong possibility of increasing fear of crime, as a recent study has demonstrated with a randomized experimental design (Rosenbaum & Bickman, 1979). The possibility of such untoward effects highlights the need for reliable and valid measures that will detect changes in fear of crime.

Measurement is important to program evaluators and funding agencies for a variety of reasons. Given the quality of many surveys and the absence of standardized measures, it is difficult to interpret a particular evaluation

or make comparisons between evaluations. At a minimum, program evaluators should begin to justify their selection of measures and report evidence of reliability and validity.

Summary. This report describes some of the major findings of a methodological study undertaken for the National Institute of Justice to develop and validate new measures of fear of crime. Conceptual and measurement issues have received insufficient attention in the fear of crime literature, and this has resulted in the use of diverse single-item scales with unknown reliability and validity. This report is one attempt to help correct this situation by recommending some new scales with known characteristics and by suggesting a general strategy for developing and validating scales. The recommended scales focus on the impact of crime on the individual, tapping into the perceptual, affective, and behavioral aspects of fear-related responses to crime.

Hopefully, this report will be useful to researchers, program evaluators, and others who are interested in measuring fear of crime. Research on the causes, consequences, and extent of fear can be improved if our conceptualization and measurement of fear itself can be advanced. Similarly, empirical planning and evaluation of crime prevention/control programs can be improved if better indicators of fear of crime are made available. Although the scales recommended in this report may not be applicable to the specific needs of the reader, at a minimum, we hope that the spirit of our methodologies for constructing and validating scales will be appreciated. We hope that survey designers will be encouraged to think seriously about the reliability and validity of any fear-related measures they are considering.

Chapter II of this report provides an overview of the research procedures

and methods used to develop and test new fear of crime measures. Chapter III includes a description of the conceptual framework used to guide the development of new measures and a discussion of the final multi-item scales produced from this research. In Chapter IV, two different response scales are described and recommended on the basis of a magnitude estimation study--each being appropriate for specific types of questions.

II. PROCEDURES FOR DEVELOPING AND TESTING NEW MEASURES

Before describing the actual scales produced in the course of this project, we shall first give a general overview of the procedures and methods used to develop and test these fear of crime indices. For additional information about the methodology, the reader is referred to other project reports (Baumer & Rosenbaum, 1980; Rosenbaum & Baumer, 1980).

The basic question addressed in this chapter is--How did we arrive at the scales and response formats recommended in Chapters III and IV, respectively? To simplify matters for the reader, we have condensed the many procedural steps needed to develop and validate scales into five basic categories of work:

- Identification and Assessment of Previous Measures.
- Development of Conceptual Framework and New Measurement Instrument.
- Testing and Refining the Initial Scales.
- Testing to Identify Optimum Response Formats/Scales.
- Testing and Refining the Revised Scales: Further Tests of Reliability and Validity.

Identification and assessment of previous measures. The first major task was to identify the domain of measures used by others over the years to define the topic area referred to here as "fear of crime." The identification of existing measures involved an extensive search of survey items concerning public opinion, attitudes, feelings, perceptions, and behavioral reactions pertinent to crime. This search covered published articles, unpublished project reports, and other documentation on public opinion polls, criminal justice research studies, and criminal justice evaluation studies. Over 500 items in this topic area were identified, although many of these

items were actually different forms of the same question.

Each of these existing measures was evaluated for possible inclusion in an initial pool of potentially useful items. This evaluation included an examination of such factors as content validity, face validity, criterion-related (construct) validity, response rates, and possible response biases (e.g., social desirability or sensitization effects). Items that were judged to be extremely low on one or more of these evaluation criteria were either eliminated from consideration or modified. The item pool was reduced, organized, and grouped to identify item similarities and differences. This process also helped to identify underdeveloped areas. In the end, the pool of items was not only useful for instrument development, but also for conceptualizing the topic area.

Development of conceptual framework and new measurement instrument. In general, we felt that the universe of existing measures was well developed in terms of covering a wide range of content areas. Of course, item wording and response formats frequently left much to be desired. One of the main problems with this literature was the absence of a conceptual framework for making sense of these diverse measures. Furthermore, there remained the important question of whether the existing measures accurately reflected the ways in which people think and feel about crime, or were merely preconceptions in the minds of researchers. Thus, to further assist us in identifying possible shortcomings with existing measures and existing conceptualizations, focused interviews were conducted with a sample of 20 urban residents. The purpose of these in-depth, open-ended interviews was to determine how people, without the aid of structured questions, describe the impact of crime in their own neighborhoods. These interviews resulted in the development of some new

items and also provided support for the belief that certain existing measures did not misrepresent or distort the ways in which people evaluate their environment, feel about crime, and describe protective measures.

After studying existing measures, focused interview results, and previous conceptualizations, a tentative conceptual framework was proposed (summarized in Chapter III) and a preliminary instrument was constructed. This instrument contained items which attempt to capture the dimensions of fear of crime as reflected in our conceptualization of the topic area.

Testing and refining the initial scales. Once we had constructed a preliminary set of scales, our plan was to begin a series of critical reviews by others and empirical tests, each resulting in the modification and refinement of the scales to be tested. First, the scales were reviewed by a panel of experts¹ on fear of crime. The instrument was then modified on the basis of this feedback and administered for the first time.

The preliminary instrument was prepared in the form of a self-administered questionnaire. The majority of subjects were undergraduates enrolled in three major universities in the Chicago area. A total sample of 275 respondents was obtained. The data from this preliminary study were analyzed for the purpose of scale refinement. Given a large pool of new and existing measures that seemed promising on both theoretical and methodological grounds, the main objective of these analyses was to identify a smaller, more parsimonious set of items that could be used at the next stage of testing as part of a revised instrument. Arriving at this smaller set of items required multiple analyses to eliminate items and to determine the scalability of various item subsets. The analytic procedures involved in the early stages are summarized below.

Scale construction and refinement combine to form a highly interactive enterprise, involving an iterative process of analysis, evaluation, revision, and reanalysis. Our goal early in this process was to develop unidimensional indicators of the components of fear with known reliabilities. Thus, our item analysis plan focused on conducting tests of unidimensionality and internal consistency. These tests were applied not only to this initial data set, but also to subsequent data sets (however, additional tests were also conducted in the follow-up research, as described later).

Items thought to be indicators of the same concept were initially examined for possible high intercorrelations, a necessary condition for unidimensionality. The primary test of dimensionality was factor analysis. (The reader is referred to Rummel, 1970, for a discussion of this technique.) If the various sets of items do, indeed, measure a common dimension, this should be reflected in the factor structure.

Reliability estimates, based on the average correlation among the various items, were calculated as estimates of each scale's internal consistency. Essentially, internal consistency refers to how well the items "hang together" and consistently measure individual differences that exist between respondents, rather than variance due to item wording and other irrelevancies. The internal consistency of each scale was assessed by computing the coefficient alpha statistic (Cronbach, 1951; Novick & Lewis, 1967; Nunally & Durham, 1975), which measures the covariation of all items in the scale simultaneously. The analytic goal here was to optimize reliability by balancing the desire for maximum internal consistency with the desire for a minimum number of items. (For a discussion of issues concerning internal consistency, see Bohrnstedt, 1970; Nunally & Durham, 1975).

Approximately 200 data points were obtained with the preliminary instrument. Many of these items were designed to measure neighborhood characteristics and personal characteristics of the respondents. Sixty-eight (68) items served as our central measures of fear-related constructs. The initial item analysis was successful at trimming this number by two-thirds to 21 items, comprising seven scales.

While the above-mentioned procedures were able to produce a set of scales that seemed to measure various aspects of fear of crime as specified by our conceptual framework, more information was needed about the characteristics of these indices before a final evaluation of them was possible. In addition to information about their factor structure and internal consistency, we needed to know about their stability over time and various aspects of validity. Hence, additional tests of reliability and validity were undertaken to further validate the scales produced in the preliminary study. These tests included not only a further analysis of the preliminary data, but also the analysis of new data sets to be described below.

Before these additional tests were conducted, another very important stage in the process of instrument development was addressed, namely the construction and validation of optimum response formats. This widely neglected aspect of survey construction is discussed next.

Testing to identify optimum response formats/scales. As noted in the Introduction, there are two halves to any structured survey question--(1) the question itself and (2) the various answers or response options that are considered acceptable. The latter half was the focus of a special study which we conducted to determine the most appropriate response formats or response scales for the fear-related questions being studied. Rather than arbitrarily

select a set of response options (which seems to be the usual practice), a magnitude estimation study was undertaken to identify response scales which meet the following criteria: approximate a ratio scale; have an optimum number of response alternatives as determined by both practical and statistical factors; and have reasonable stability across a number of variables.

Numerous procedural steps were necessary to develop the desired response scales. First, various tasks were directed at identifying lists of response modifiers that would be most appropriate for study. Based on our research and previous studies on fear of crime, we concluded that the magnitude estimation study should be limited to an assessment of two types of adverb modifiers--those which modify expressions of intensity and those which modify expressions of frequency.

The magnitude estimation literature and the fear of crime literature were then re-examined to identify specific adverb modifiers for both intensity and frequency adjectives. In the final analysis, 14 intensive adverbs were selected for inclusion in the magnitude estimation study, ranging in intensity from "not at all" to "very, very." In addition, six (6) expressions of frequency were selected, ranging from "always" to "never."

The second set of tasks was directed at constructing the magnitude estimation instrument so that certain methodological standards were achieved. The instrument was a self-administered questionnaire that contained 54 items (excluding demographic questions)--42 pertaining to expressions of intensity and 12 pertaining to expressions of frequency. The order of presentation was varied for adjectives and adverb modifiers to control for possible order effects.

The third set of tasks focused on data collection. The questionnaire

was administered to 204 respondents, most of whom were undergraduates from two major universities in the Chicago area. Essentially, respondents were told that the purpose of the questionnaire was to help eliminate some of the vagueness and imprecision associated with words that describe how crime affects them by attaching numbers to a variety of words and phrases. The following example shows how the respondent was given a standard for comparison when making estimates of intensity--"IF SOMEWHAT AFRAID IS 50 on your scale, then VERY AFRAID IS ___." In this example, "somewhat" and "very" are adverb modifiers of the adjective "afraid." In all cases, "somewhat" was assigned a magnitude of 50.

Estimates of frequency were presented as shown in the following example--"How often do you leave a light on when you go out at night? Never___, Once in awhile___, Sometimes___, Quite often___, Frequently, if not always___, Always___." In your answer above, how often do you mean? ___% of the time I leave a light on when I go out at night." Thus, a categorical item was followed up immediately by a percentage magnitude estimation item. (For a complete description of the instructions, see Rosenbaum & Baumer, 1980).

The primary objective of the data analysis plan was to identify the "best" scale of intensity modifiers and the "best" scale of frequency modifiers. The criteria for determining what were the "best" scales and the manner in which the modifiers were selected is summarized in Chapter IV, along with the actual results.

Testing and refining the revised scales: Further tests of reliability and validity. The procedures described up to this point were useful for determining certain scale characteristics (e.g., internal consistency), but the presence of other traits needed to be established before the scales could be

recommended as "good" scales. To produce this additional information about reliability and validity, a number of tasks were performed, including further analysis of the preliminary data and a readministration of the instrument after the desired revisions had been made. The specific tasks of interest are summarized below.

In addition to internal consistency, temporal stability is an important feature of a reliable scale. Repeated measures of an enduring trait or construct should produce similar results with each application. Temporal stability or test-retest reliability is typically assessed by readministering the scale to the same respondents a second time and then computing the correlation between the measures taken the first time and those repeated the second time. To estimate the temporal stability of our scales, the preliminary instrument was readministered twice to a subsample of respondents, once after two weeks and then again two weeks later. Three observations were conducted, rather than the usual two, for the purpose of helping to distinguish true change from measurement unreliability (see Heise, 1969).

As we moved beyond questions of reliability, questions of validity became the primary thrust of our testing effort. First, we were interested in the question of external validity, namely, whether the results of the first study could be generalized to other populations and other conditions. In particular, the question of interest was whether the results obtained from students using a self-administered questionnaire could be replicated in the general population using a telephone survey methodology. Knowing that the final measures would have their greatest utility in the form of a telephone survey with known reliability and validity in a general urban population, we decided to attempt a replication of the preliminary data using this larger

population and employing a random-digit dialing methodology.

In addition to testing the generalizability of the findings, this telephone survey also served as a data base for testing other aspects of validity. In fact, the choice of respondents was determined by these other validity questions. Most of these questions were addressed to construct validity, i.e., the extent to which the measures actually measure the fear-related theoretical constructs which they were designed to measure. Obviously, construct validity should be a primary focus of any serious attempt at scale validation. As Crano & Brewer (1973) note, construct validity can be assessed in a number of ways, but one of the most common strategies is called the "known-groups method." This validation procedure requires that data be collected from groups that are known to differ (or are theoretically expected to differ) on the attribute or construct being measured. This approach is based on the assumption that if a scale actually measures the construct which it was designed to measure, then groups known or expected to differ on this construct should be discriminable according to their scale scores. Group membership may be defined in terms of one or more variables.

The known-groups method was an important part of our approach to testing construct validity. Three major sets of variables (or "known groups") were identified for hypothesis testing: (1) level and type of crime in the respondent's neighborhood, (2) respondent's victimization history, and (3) the respondent's personal characteristics. In general, we hypothesized that scales which purport to measure various components of fear of crime should differentiate between individuals who reside in neighborhoods with differing crime problems, who have different victimization histories, and who have different demographic characteristics. (Specific hypotheses are stated in

Chapter III). The samples selected for the application of the telephone survey were determined by some hypotheses about known group differences. Thus, telephone interviews were conducted with residents from two geographically distinct urban neighborhoods--one having moderately high street crime (n = 154) and the other having moderately low street crime (n = 161). Furthermore, a sample of 83 crime victims (35 personal robberies/assaults and 48 residential burglaries) was drawn from police records and interviewed by telephone.

Our efforts to assess the construct validity of these new scales did not stop with the known groups technique. Several additional validation strategies were exploited in the present research. As noted earlier, various forms of inter-item correlations constitute an important method of determining whether the measures are, indeed, tapping the factors which they are expected to measure. Again, both factor analysis and tests of internal consistency played a very significant role in scrutinizing the internal structure of the revised scales.

Another fundamental set of validation procedures for testing construct validity is commonly referred to as tests of "convergent" and "discriminant" validity. Although we did not utilize the complete multitrait-multimethod matrix technique proposed by Campbell & Fiske (1959), we did follow the basic logic of this approach by measuring variables other than fear of crime to look for possible convergence or divergence of measures. The basic question was the following--Are the fear of crime scales related or unrelated to other variables in a theoretically predictable way? Thus, we tested a number of hypotheses concerning the relationship between the fear of crime scales and their expected antecedents, consequences, and noncorrelates.

Summary. The above synopsis of our methodological and analytical procedures indicates that we attempted a multifaceted strategy for scale construction and validation. We believe that this approach has resulted in a greater knowledge of reliability and validity than could be expected from a less comprehensive strategy. However, we wish to emphasize that validity is not an all-or-nothing characteristic of scales. As others (e.g., Crano & Brewer, 1973; Nunnally, 1967) have reminded us, the research objective is to examine the extent of validity that can be attributed to the proposed scales, keeping in mind that validity is a descriptive, relativistic concept.

III. RECOMMENDED FEAR OF CRIME SCALES

Conceptual Framework

This chapter provides a description of the multi-item scales that were developed in the course of our research and the validation results that were obtained. Before presenting these scales, an overview of the conceptual framework will be given, as it provided some theoretical guidance in scale construction and validation. As suggested in Chapter I, "fear of crime" has not been clearly defined in either popular or scientific usage. A close look at existing items indicates that the term has been used in reference to feelings, beliefs, perceptions, opinions, and behaviors regarding crime. Hence, one of the most fundamental questions is -- What is meant, and should be meant, by the phrase "fear of crime"? More specifically, can we identify some meaningful components of the general construct that are conceptually and empirically distinct?

Certainly, "fear of crime," as commonly conceived, is not fear of crime at all. Technically speaking, "fear" refers to an immediate, acute, emotional and physiological response to a particular stimulus event. (See the literature on emotions -- Leventhal, 1974; Plutchik, 1980). Obviously, the "fear of crime" literature focuses on more distant, and for many respondents, less tangible criminal events. From 1967 to present, a handful of researchers have struggled with the conceptual problems associated with defining fear of crime. These individuals regularly acknowledged the multidimensionality of the construct and have made some progress toward refinement. We will not review these previous conceptualizations here (see Baumer & Rosenbaum, 1981), but only point out that there appear to be four conceptually distinct dimensions in this literature: (1) concern about crime as a social issue; (2) estimates of the nature and

extent of local crime; (3) concern for personal safety; and (4) behavioral adaptations. In an effort to further advance this knowledge base, we have sought to (1) incorporate this information into a broader conceptual framework that will clarify the psychological importance and interdependence of these diverse responses to crime, and (2) operationalize and test the distinctiveness of the dimensions represented in this framework.

We will begin by noting that the first dimension listed above -- concern about crime as a social issue -- although clearly part of the "crime problem" and potentially important for political action -- is generally recognized as not intimately related to what is meant by "fear of crime" (cf. Conklin, 1975; Dubow, et. al., 1978). Fear of crime is generally viewed as a more personal set of responses to crime. Thus, we excluded "concern about crime" from our conceptual domain and focused on dimensions which deal directly in crime in relationship to one's own neighborhood and in relationship to oneself.

After several attempts to modify existing conceptualizations in this topic area and develop entirely new frameworks, we concluded that one of the most valuable strategies would be to define and classify responses according to their psychological utility for the individual citizen. Given this perspective, we discovered that most of the "fear of crime" literature could be understood in terms of stress theory, as developed by Lazarus (1966). Thus, we have chosen to apply stress theory to fear of crime because (1) it can describe the impact of crime from the individual's perspective in a manner that is superior to previous conceptualizations; (2) it can account for the interrelationship between distinct dimensions of fear of crime; and (3) it is sufficiently general to serve as a foundation for building more complex models that are specific to crime and fear of crime.

According to Lazarus' stress model (Lazarus, 1966; Lazarus & Averill, 1972), there are three basic elements to a stress situation (in addition to the individual's disposition), namely: (1) the presence of stimulus conditions; (2) a cognitive assessment or appraisal of the threat provided by these conditions; and (3) coping responses designed to reduce the threat. Within this framework, an emotional or behavioral coping response does not result directly from the stimulus conditions, but rather, is the result of the individual's assessment or "appraisal" of the threat provided by the situation. Critical to this approach is the distinction between the simple perception of a stimulus situation and the assessment of the situation as threatening:

For threat to occur, an evaluation must be made of the situation, to the effect that a harm is signified The appraisal of threat is not a simple perception of the elements of a situation, but a judgment, an influence in which the data are assimilated to a constellation of ideas and expectations The mechanism by which the interplay between the properties of the individual and those of the situation can be understood is the cognitive process of appraisal, a judgment about the meaning or future significance of a situation based not merely on the stimulus, but on the psychological makeup (Lazarus, 1966, p. 44).

Hence, this model makes some important distinctions, as well as specifies some useful relationships. Essentially, the various types of appraisal (not to be described here) serve as cognitive processes which mediate the relationship between the environmental stimulus conditions and the emotional or behavioral response. Appraisal is determined by both the environmental stimuli and dispositional variables (e.g., personality traits, demographic characteristics). To reduce a perceived threat, the appraisal process usually results in coping responses which fall either into the general category of "direct actions" (e.g., protective behaviors) or "intrapsychic processes" (e.g., defense mechanisms -- denial of risk/fear).

The conceptual trends identified in the fear of crime literature are easily

assimilated into the stress model, with the result being a clarification of the general construct. First, the area referred to as "estimates of the nature and extent of local crime" (or "perceptions of crime") can be seen as corresponding to the simple perceptions of the stimulus conditions as put forth in stress theory. These beliefs about the nature and extent of crime in the local environment would be largely perceptual and nonevaluative. Hence, the operational definition (or measures) of this component should not include items which require an interpretation or appraisal of the personal significance of the environmental stimuli.

Second, "concern for personal safety" or the affective dimension can be viewed as a consequence of the appraisal of threat present in the environmental stimuli. This involves an assessment and definition of the situation in terms of the threat it presents to one's own safety. While this assessment may be based in part on cold perceptions, it is primarily a result of social definitions, prior learning, and individual characteristics. Included in this category would be all types of assessments which involve the personalization of threat, such as estimates of risk (Furstenberg, 1971), feelings of personal safety (Hindelang, Gottfredson, & Garofalo, 1978), or worry about victimization (Fowler, et. al., 1979).

Finally, behavioral adaptations can be viewed as direct coping actions designed to reduce the perceived threat of victimization. This category of actions could include a wide variety of goal-oriented behaviors, intended to reduce the risk of victimization.

The above discussion suggests that the fear of crime literature may be usefully interpreted as defining the major components of a stress reaction. From this perspective, crime represents a potential environmental stressor. Its significance is evaluated (appraised) in terms of the amount of threat it

poses for the individual, and this threat can be conceptualized in affective terms (e.g., fear, worry). Behavioral adaptations are viewed as strategies designed to cope with (or reduce) this threat. Hence, this model implies a causal ordering of the constructs under study, which helps to explain their interrelatedness, and it also implies a conceptual distinctiveness. The individual's assessment of personal safety and the affective responses associated with this assessment are determined by the "objective" perceptions of the crime problem and various dispositional factors within the individual. In turn, the individual's assessment of personal safety should produce certain behavioral responses that are deemed appropriate for coping with the level of threat being experienced. Given this conceptual framework, our research has sought to operationalize and validate the dimensions of "fear of crime" that correspond to the three basic elements of the stress situation -- perceptions of crime in the environment, concern for personal safety that results from the appraisal of threat, and behavioral adaptations. Multi-item additive scales have been constructed to measure each of these dimensions. The results obtained in each of these three areas will be summarized in the remainder of this chapter. These results include statements about the reliability and validity of the scales constructed.

Perceptions of Crime: A Recommended Scale

As discussed earlier, this class of phenomena includes knowledge, beliefs, and perceptions regarding the nature and extent of crime in the local environment. This perceived environment may serve as a set of stress-producing stimuli.

After carefully considering a variety of measures, 11 questions were included in the preliminary study. Six items focused specifically on the neighborhood crime problem, asking respondents about the frequency of robbery, assault, sexual assault, residential burglary, and auto theft, as well as asking them to estimate the overall crime rate in their neighborhood. The other five items focused on the environmental cues or behavioral activities that might be employed as "signs of disorder" (Skogan & Maxfield, 1981) or "signs of crime" (Stinchcombe, et. al., 1978). These items asked about the frequency of visible signs of vandalism, the presence of "run down" buildings, strangers "just hanging around," small children playing outside, and attention given to lawns in the neighborhood.

A factor analysis performed on these preliminary data indicated that the 11 items were unidimensional, thus confirming our belief that "signs of crime" are closely related to beliefs about the extent and nature of criminal activity. One of the primary purposes of the analyses conducted at this stage was to reduce the number of items needed to define each scale, without significantly lowering the scale's internal consistency/reliability. We were able to move from a nine-item scale, with an alpha reliability of .894, to a three-item scale, with an alpha of .863. Thus, the following three items were retained for the second stage of data collection as a potentially acceptable "Perceptions of Crime" scale:

1. Think about robbery in your neighborhood; that is, taking things like money, purses, or wallets from people on the street. Does this happen very often, pretty often, not too often, or almost never?
2. Besides robbery, how about people being assaulted or beaten up on the street in your neighborhood? Does this happen very often, pretty often, not too often, or almost never?
3. In general, how would you describe your neighborhood in terms of crime; that is, considering all types of crime? Would you describe the crime rate in your neighborhood as very high, higher than average, about average, lower than average?

This preliminary scale suggests that what we have labeled "perceptions of crime" is better defined by items which focus directly on crime than it is by items which relate to crime indirectly via signs of danger or incivility. Furthermore, when respondents think of "crime" (item #3), they apparently think in terms of street crime (items #1 and #2).

This preliminary scale, along with the other preliminary scales to be discussed, was subject to further examination by analyzing data collected from the telephone survey of residents in two urban areas. This additional testing included an assessment of the replicability of the above findings, test-retest reliability, and construct validity.

Before mentioning the results of the telephone survey, we should note that the response scales were slightly modified between the time of the preliminary study and this final telephone survey. These changes were based on the findings of our magnitude estimation study and were an attempt to establish ratio scales with equal intervals (Chapter IV of this report is devoted to this topic). Consequently, we recommend that users of the above scale substitute the following response scale for the first two items mentioned: "never," "sometimes," "quite often," "very often."

Our analysis of the telephone survey data confirmed our belief that this Perceptions of Crime scale possesses adequate reliability and validity. First,

the replication effort was quite successful, confirming the internal reliability and unidimensionality of the three-item scale. An alpha coefficient of .80 was obtained (compared to .86 in the preliminary study) indicating that the items "hang together" reasonably well and seem to account for a fair amount of the response variance between individuals. In addition, the three items seem to contribute equally to the definition of the scale, as indicated by their similar factor loadings (see Table 1). As further evidence that the items "hang together" in defining the Perceptions of Crime Index, the item-total correlations were moderately high for all three items (.64 to .66), and the deletion of any one item would reduce the reliability considerably below the three-item figure. The simple test-retest correlations were all above .70. By using three measurement points, we were able to separate temporal instability from reliability (see Coleman, 1968; Heise, 1969). The stability coefficients suggest that the index is even more stable than the simple test-retest correlations would indicate. The corrected reliability coefficient was .84.

Finally, we examined the construct validity of the scale in terms of whether it is related to other variables (antecedents and consequences) in a theoretically predictable way. We have proposed several hypotheses about the correlates of the Perceptions of Crime index. Four hypotheses will be stated below, accompanied by the results that apply to each. Overall, these findings are very supportive of the construct validity of this scale.

First, assuming some relationships between perceptions and reality, this index should be sensitive to ecological variations in crime rates, especially differences in "street crime," since such crime was central to this scale. To test this hypothesis, we compared an urban area of moderately high street crime (Wicker Park, Chicago) with a suburban area of moderately low street crime (Evanston, Illinois). Neither were extremely high or low, but the index should

TABLE 1: FACTOR ANALYSIS OF
"PERCEPTIONS OF CRIME" ITEMS (N=301)^A

| ITEM | FACTOR LOADING ^B |
|----------------------|--------------------------------|
| Frequency of Robbery | .752 |
| Frequency of Assault | .785 |
| Overall Crime Rate | .728 |

^A Urban neighborhood samples only.

^B This single factor accounted for 71.3 percent of the variance in the items.

be sensitive enough to identify a significant difference. Indeed, the urban residents did score significantly higher on this scale than did the suburban residents, $F(1, 311) = 56.03, p < .01$. Hence, the Perceptions of Crime index was able to detect that the two populations were perceiving different criminal environments.

Our second hypothesis states that the two variables most strongly related to traditional measures of fear -- sex and age of the respondent -- will not be related to the Perceptions of Crime scale. The rationale for this hypothesis is that the scale is intended to measure a relatively nonevaluative, impersonal assessment of the local crime rate, whereas traditional measures of fear (e.g., feelings of safety) have focused largely on evaluating crime in terms of the threat that it poses to oneself (we shall cover the latter in the next section of this chapter). Thus, we are hypothesizing that respondents are able to make a somewhat objective assessment of the local crime rate, one that is unaffected by their own personal characteristics. The results support this hypothesis, as neither sex nor age was related to the Perceptions of Crime scale. These findings are consistent with those reported by Conklin (1975).

Although this index is being defined as a somewhat objective assessment of the neighborhood crime problem, our third hypothesis states that this measure of perceptions will be affected by personal and vicarious experiences about crime which are relevant to the perception being formed. Specifically, the third hypothesis states that recent victims of robbery and assault will perceive more crime than nonvictims, as measured by this index, but that recent victims of burglary will not perceive the crime problem any differently than nonvictims. The perceptions of crime held by burglary victims are not expected to change as a function of their victimization experience because the index focuses primarily on "street crime" or "violent crimes."

As noted in Chapter II, a separate sample of victims was drawn from Evanston police reports to help test this hypothesis. The results clearly support the hypothesis: The robbery and assault victims perceived significantly more crime in their neighborhoods than did nonvictims, $F(1, 185) = 14.86, p < .01$. Furthermore, the burglary victims perceived no more crime than nonvictims.

The final hypothesis dealt with some potential effects of perceptions of crime, rather than causes. Specifically, the fourth hypothesis states that perceptions of crime should affect parents' concern for the safety of their children. We asked parents how worried they were about their children being robbed or assaulted in the immediate neighborhood. The results confirmed our expectation that parents who scored high on the Perceptions of Crime scale (i.e., viewed their neighborhood as having a high crime rate) would worry more about their children being robbed, $F(2, 102) = 9.16, p < .01$, and being assaulted, $F(2, 104) = 9.74, p < .01$.

To summarize, the Perception of Crime scale is supported with evidence of reliability and validity. The index is unidimensional and has internal reliability in the .80 to .86 range. The test-retest correlations were all over .70 for this scale, and the corrected reliability coefficient was .84. All hypotheses concerning the validity of the index as a measure of perceptions of crime were empirically supported. As hypothesized, the Perceptions of Crime index is related to place of residence, prior robbery or assault victimization, and worry about the safety of one's children. As hypothesized, it was not related to sex or age, traditionally the most powerful predictors of fear, nor was it related to prior burglary victimization. Therefore, the data suggest that this index is a reliable and valid measure of perceptions of crime. Given that respondents viewed the overall "crime rate" as strongly related to

the frequency of robbery and assault, this index can be interpreted as their nonevaluative assessment of the quantity of personal crimes committed in their local neighborhoods.

Concern for Personal Safety: A Recommended Scale

The next scale that we constructed and tested was initially developed to measure affective and (to some extent) evaluative responses to local environmental stimuli. This area, which we shall refer to as concern for personal safety, involves the personalization of crime, i.e., "What does the local crime problem mean in terms of my own safety?" The evaluative process (which Lazarus, 1966, calls "secondary appraisal") may involve an assessment of one's own chances of being victimized given the crime problem and one's personal characteristics, and will probably result in certain affective responses (e.g., "I'm very afraid").

In the preliminary study, potential measures of concern for personal safety included both affective items (i.e., how worried, safe, afraid, or concerned they were about being victimized by various crimes) and evaluative items (i.e., subjective estimates of risk, defined by asking for the "likelihood" and "chances" of becoming a victim). We also included the commonly used National Crime Survey and Gallup/NORC General Social Survey items. The initial factor analysis produced two factors -- one for personal crimes (containing all 13 items on robbery, assault, and street crime) and one for property crimes (containing all six burglary items). Thus, type of stimulus crime (personal vs. property), rather than type of response (e.g., worry vs. concern), seemed to define the primary dimensions. The two factors were analyzed separately. Each was shown to be unidimensional.

Data reduction and parsimony were pursued before moving on to the next stage of data collection and validation. The factor measuring fear of personal crimes was reduced to four items -- two affective items (afraid of robbery; afraid of assault), and two evaluative items (likelihood of robbery; likelihood of assault). These four items formed an additive index, with an alpha reliability

of .94, only slightly below that of the full 13-item scale. The factor measuring fear of property crime was reduced to three items -- two affective items (afraid of burglary; concern about burglary) and one evaluative item (likelihood of burglary). This three-item index produced an alpha coefficient of .85.

The telephone survey data were then collected on the seven items described above, as well as two additional items needed to balance the item sets (concern about robbery; concern about assault). Unfortunately, this second data set did not seem to yield the same pattern of results. Two factors emerged, but they were not defined by the personal-property distinction. Although the first factor was again predominantly defined by the affective items measuring fear of personal crime, the second factor was not easily interpreted. Not only did the burglary items load on this second factor, but so also did the evaluative items focusing on the likelihood of victimization, including the likelihood of robbery and assault (See Table 2).

Thus, while an emotional/affective dimension could be created to define reactions to the personal crimes of robbery and assault, such a factor would not explain reactions to burglary. Perhaps it is conceptually incongruous to think that property crimes are fear-producing when the threat of personal harm lies at the core of most fear responses. The data suggest that concern for personal safety with regard to burglary is best captured by an evaluative index that focuses on the likelihood of being burglarized.

Although an assessment-of-risk (likelihood) scale could be developed, our primary interest here was to measure the affective dimension of fear of crime. Thus, the three likelihood items were eliminated and the six affective items were factor analyzed. Through several analytic steps, we moved from a six-item scale to a four-item scale. The two burglary items (afraid, concerned)

Table 2
Factor Analysis of Nine "Concern for Personal Safety" Items:
General Population (N = 300)

| Item | Factor Loading | |
|--|----------------|-----------|
| | Factor I | Factor II |
| A. Orthogonal Solution | | |
| Concern about robbery | .657 | .420 |
| Concern about burglary | .351 | .599 |
| Concern about assault | .696 | .418 |
| Likelihood of robbery | .362 | .640 |
| Likelihood of assault | .431 | .638 |
| Likelihood of burglary | .143 | .769 |
| Afraid of robbery | .859 | .282 |
| Afraid of burglary | .427 | .480 |
| Afraid of assault | .865 | .266 |
| B. Oblique Solution^A | | |
| Concern about robbery | .621 | .217 |
| Concern about burglary | .165 | .576 |
| Concern about assault | .670 | .197 |
| Likelihood of robbery | .160 | .622 |
| Likelihood of assault | .245 | .588 |
| Likelihood of burglary | .168 | .880 |
| Afraid of robbery | .932 | -.044 |
| Afraid of burglary | .311 | .396 |
| Afraid of assault | .946 | -.066 |

^AFactor pattern matrix. The correlation coefficient between these two factors was .65.

were eliminated because they were least central to the index and actually suppressed the alpha coefficient. Thus, our first set of analyses lead us to tentatively recommend the following four-item scale, which has an alpha coefficient of .90, and seems to measure the affective dimension which we have labeled Concern for Personal Safety:

1. When you are walking alone in your neighborhood at night, how concerned are you that someone will take something from you by force or threat? Would you say that you are not at all concerned, somewhat concerned, quite concerned, or very concerned?
2. When you are walking alone in your neighborhood at night, how concerned are you that someone will harm you? Are you . . . (see #1)?
3. When you are walking alone in your neighborhood at night, how afraid are you that someone will take something from you by force or threat? Are you not at all afraid, somewhat afraid, quite afraid, or very afraid?
4. When you are walking alone in your neighborhood at night, how afraid are you that someone will harm you? Are you . . . (see #3)?

Further tests of the reliability and validity of this Concern for Personal Safety index were very positive. In terms of reliability, the simple test-retest correlations were all relatively high, ranging from .86 to .92. Thus, the index appears to be measuring a stable construct. The stability coefficients were all above .90. The refined reliability coefficient for this scale was .95, again suggesting that the scale variance was due to individual differences rather than random sources of error.

Several hypotheses were generated to test the validity of this Concern for Personal Safety index. First, we hypothesized that concern for personal safety should be affected by the actual and perceived crime rate in one's neighborhood. Objective environmental differences in crime were measured by place of residence (high crime area in Chicago versus low crime city of Evanston), and subjective differences were measured by the Perceptions of Crime scale. As predicted, we found that respondents in the Chicago area reported feeling significantly more

concerned for their personal safety than did the Evanston respondents, $F(1, 313) = 22.47, p < .01$. Similarly, individuals who perceived more crime in their neighborhoods felt more concerned than others $F(2, 310) = 46.49, p < .01$.

The second hypothesis addressed the effect of prior victimization on the Concern for Personal Safety index. Because concern for personal safety seems (theoretically) to be intimately connected to personal crimes (involving offender-victim contact), we expected that prior robbery victims should be more concerned about personal safety than nonvictims, but that prior victimization by burglary should have no effect on this personal safety scale. These predictions were supported by the data. Specifically, victims of violent personal crimes (both robbery and assault) were more concerned for their safety than nonvictims, $F(1, 186) = 12.33, p < .01$, while burglary victims did not differ from the general population of nonvictims in their concern for personal safety.

The third hypothesis concerned the effect of a respondent's personal characteristics on the Concern for Personal Safety scale. We hypothesized that the respondent's age and sex would be related to feelings of safety in a predictable way, although these characteristics were not expected to be related to the Perceptions of Crime scale (as shown earlier). If the Concern for Personal Safety scale measures feelings about crime in terms of one's own vulnerability to victimization, then scale scores for females and the elderly should indicate more concern for personal safety than their counterparts. (Unlike the Perceptions of Crime scale, the present scale personalizes the crime problem by defining it in relationship to oneself.) This hypothesis was also supported by the results. Women were more concerned about personal safety than men, $F(1, 311) = 44.65, p < .01$, and the elderly (especially those

over 65), were more concerned than younger respondents, $F(5, 304) = 5.84$, $p < .01$.

Finally, we hypothesized that certain behavioral reactions should result from feeling unsafe, as the stress model would predict. Specifically, we expected a positive correlation between the Concern for Personal Safety scale and behaviors directed at protecting oneself against street crime, but no correlation between the scale and behaviors directed at property protection. The data confirmed this hypothesis, as shown by the zero-order correlations. All nine of the items measuring personal protective behaviors were significantly related to the Concern for Personal Safety scale, with the correlations ranging from .18 to .55. In contrast, only one of the five items measuring property protection behaviors was related to this index.

In summary, a four-item scale has been developed and validated as a measure of concern for personal safety. The burglary items and the probability ("how likely") items formed a separate scale, and thus were excluded from the final analyses. The final scale seems to tap the individual's fear of being victimized by street crimes, especially robbery and assault. This additive index is internally reliable, producing an alpha coefficient of .90, with item-total correlations all between .70 and .80. Test-retest correlations were all above .86. The three stability coefficients were above .90 and the refined coefficient was .95. The construct validity of this four-item scale was demonstrated by empirical support for several hypotheses. Environmental differences in crime, personal characteristics of the respondent, prior experience with victimization, and behavioral reactions were all significantly related to this Concern for Personal Safety scale in the predicted manner.

Behavioral Adaptations: A Recommended Scale

The third area in which scale construction and validation was undertaken can be referred to as crime-related behavioral adaptations. These behaviors are actions which people take to protect themselves or their property from crime. In our theoretical framework, these behaviors were depicted as reactions to threatening situations -- reactions employed by the individual as a means of reducing the threat of victimization.

Unfortunately, behaviors are sometimes more difficult to conceptualize than affective states or cognitions, as the latter often cluster together, vary in intensity, and/or show some stability across different situations. In contrast, there are a variety of behavioral responses that may be employed to cope with a particular threatening crime situation. Diverse behaviors may be seen as interchangeable, and thus, different people, when faced with the same situation, may choose different behavioral adaptations. Furthermore, behaviors can be very situation-specific and may not generalize across related, but different, crime situations.

These characteristics of behavioral responses cast doubt on our ability to apply standard techniques of scale construction and validation, especially our ability to identify a common, stable factor. Nonetheless, we attempted to apply the standard techniques of analysis described in the previous section, in an effort to advance our understanding of behavioral responses to crime. Previous efforts to measure behavioral responses have rarely looked for commonality among behaviors, but rather have simply counted the number or frequency of specific actions. Furthermore, behavioral adaptations, in general, have not been included in previous efforts to conceptualize fear of crime, but have been treated separately. This is unfortunate, because behaviors are generally viewed by psychologists as being among the more accurate indicators of an individual's

internal psychological states.²

In this research, we have looked at a wide variety of potential behavioral responses to crime. Conceptually, the 38 behavioral items that were selected fell into the five basic categories: (1) personal protective behaviors when out alone; (2) home invasion measures taken when at home; (3) target-hardening devices used to protect against loss of property; (4) specific home security measures employed the last time the respondent went out; and (5) general home security measures employed when the respondent goes out. Each of these variable sets was initially analyzed separately to identify potential scales. The results of the preliminary and final studies are summarized below.

We will begin by discussing the areas where scale construction efforts were unsuccessful. Three of the five sets of behavioral items fit this description, as they could not be scaled to meet conventional criteria. First, three of the items concerning target-hardening devices (dead bolt locks, bars on windows, "burglar bar" on door) formed a scale with marginal internal consistency in the preliminary study. However, these items were retained for the final study to eliminate the possibility that the results were an artifact of the preliminary study. Nonetheless, the final study was again unable to produce an acceptable scale.

Secondly, three of the items concerning security measures used the last time they went out (leaving a light on, asking a neighbor to watch their home, closing and locking windows) were only moderately related in the preliminary study. Again, these items were retained in the final study, but failed to share enough commonality to establish a solid index.

The third set of variables that was resistant to scaling focused on general home security measures. (These items were the same as the second set discussed above, except that they referred to general behavior tendencies,

rather than "the last time you went out.") Using these preliminary data, these items did not form an acceptable additive index using standard procedures, nor did they form an acceptable Guttman scale, as we might expect based on previous research (Lavrakas, 1979). Consequently, they were not re-examined in the final study.

Turning now to the successful results, the remaining two sets of behavioral items each formed unidimensional scales with acceptable characteristics. First, the preliminary study allowed us to reduce the set of personal protective behaviors from 12 to 5 items (avoiding certain areas, avoiding certain types of people, avoiding carrying too much cash, walking only on certain streets, avoiding talking to strangers in the neighborhood). These five items, which seem to represent a desire to avoid trouble on the streets, formed a unidimensional, additive scale in both the preliminary study and the final study. However, because two items with low loadings suppressed the reliability of the index in the final study (see Table 3) they were deleted from the final scale. The three-item scale³ demonstrated an acceptable alpha reliability of .80 and moderate item-total correlations, ranging from .60 to .70. Thus, prior to the validity tests, we tentatively recommend the following scale labeled Avoidance of Street Crime:

1. When you go out at night in your neighborhood, how often do you try to avoid certain areas? Do you do this never, sometimes, quite often, or always?
2. How often do you try to avoid certain types of people when you go out alone in your neighborhood? Do you do this . . . (same as #1 above)?
3. How often do you walk only on certain streets when you go out alone at night in your neighborhood? Do you do this . . . (same as #1 above)?

The second set of items where scale construction was somewhat successful in the early stages may be described as protection against home invasion. Of

TABLE 3: FACTOR ANALYSIS OF FIVE
AVOIDANCE OF STREET CRIME ITEMS

| ITEM | FACTOR LOADING ^A |
|--|-----------------------------|
| When you go out at night in your neighborhood, how often do you try to avoid certain areas? | .781 |
| How often do you try to avoid certain types of people when you go out alone in your neighborhood? | .718 |
| When you go out alone in your neighborhood, how often do you avoid carrying too much cash? | .506 |
| How often do you walk only on certain streets when you go out alone at night in your neighborhood? | .715 |
| How often do you avoid talking to strangers when you go out alone at night in your neighborhood? | .544 |

^A This single factor accounted for 54.3 percent of the variance in these five items.

the five items originally included in the preliminary study, four were retained for further study (keeping all of the doors locked, keeping all of the windows locked, drawing the curtains at night, not opening the door unless they know who is there). The preliminary and final studies each demonstrated that these four items were unidimensional. However, the factor loadings were not high in the final study (see Table 4). Apparently, we were dealing with a loosely defined construct, and further evidence of this can be found in the modest alpha reliability of .59 and modest item-total correlations, ranging from .33 to .43. Nonetheless, the four items did define a single dimension and formed a scale having marginally acceptable internal consistency. Hence, prior to the validity tests, we tentatively recommend the following Protection Against Home Invasion:

1. When you are home alone at night, how often do you keep all of the doors locked? Do you do this never, sometimes, quite often, or always?
2. How about the windows -- when you are home alone at night, how often do you keep all of the windows locked? Do you do this . . . (same as #1 above)?
3. When you are home alone at night, how often do you draw the curtains or pull the shades? Do you do this . . . (same as #1 above)?
4. When you are home alone at night, how often do you open the door without knowing who is there? Do you do this . . . (same as #1 above)?

The items comprising this scale seem to be directed more toward protection against home invasion than the protection of property. Although the scale did not demonstrate strong internal reliability, its test-retest stability was better. The test-retest correlations ranged from .73 to .78, with an overall corrected reliability coefficient of .83.

Finally, let us review the results concerning the construct validity of the two behavioral scales that have been tentatively recommended. These scales

TABLE 4: FACTOR ANALYSIS OF PROTECTION AGAINST
HOME INVASION STRATEGIES (N=309)

| ITEM | FACTOR LOADING ^A |
|---|-----------------------------|
| When you are home alone at night, how often do you keep all of the doors locked? | .655 |
| How about the windows -- when you are home alone at night, do you keep all of the windows locked never, sometimes, quite often, always? | .499 |
| When you are home alone at night, how often do you draw the curtains or pull the shades? | .396 |
| When you are home alone at night, how often do you open the door without knowing who is there? | .585 |

^A This single factor accounted for 46.4 percent of the variance in the items.

shall be referred to as the Avoidance of Street Crime index and the Protection Against Home Invasion index. Several hypotheses and pertinent results are discussed below for each scale.

The first set of hypotheses concerns how these behavioral scales are affected by the Perceptions of Crime and Concern for Personal Safety indices. To the extent that respondents perceive a crime problem in their neighborhood and interpret this problem as a threat to their own safety, they should be motivated to engage in behaviors directed at the avoidance of street crime and home invasion as means of coping with this threat. This general hypothesis, derived from the stress model, was translated into several predictions that were supported by the data.

As predicted, respondents engaged in more avoidance of street crime when they perceived more crime in their neighborhood, $F(2, 310) = 18.12, p < .01$, and when they were more concerned for their personal safety, $F(3, 311) = 39.14, p < .01$. Furthermore, they engaged in more anti-home invasion behavior when they were more concerned for their personal safety, $F(3, 11) = 6.11, p < .01$. However, contrary to expectation, anti-home invasion behaviors were unaffected by perceptions of the neighborhood crime problem. We expected that anti-home invasion behaviors would be less affected by these antecedent conditions than would avoidance of street crime behaviors,⁴ but significant effects for both perceptions of crime and safety were still expected simply because neighborhood crime is usually translated into personal threat to one's own safety and thus, a need for protection.

Given our theoretical framework, we also predicted that behavioral adaptations in general would be more closely related to concern about personal safety than to perceptions of the crime problem. In contrast to perceptions of crime, concern about safety should reflect the individual's appraisal of

threat to oneself and, as such, should be more closely connected to personal coping behaviors. Indeed, the magnitude of the F ratios listed above supports this prediction, as the relationships between adoptative behaviors and feelings of safety were larger than the relationships between adoptative behaviors and perceptions of crime.

We next hypothesized that the respondent's sex and age would affect both behavioral indices, with no reason to expect differences in the magnitude of these relationships. The assumption here is that these personal characteristics are good indicators of the individual appraisal of threat and perceived vulnerability to victimization, with females and the elderly interpreting their environments as more threatening (fear-arousing) than their counterparts. If behaviors are viewed as adaptive mechanisms for reducing threat, then female and older respondents should engage in more protective behaviors.

The results clearly supported the sex prediction, but did not support the age prediction. As predicted, women were more likely than men to engage in both the avoidance of street crime, $F(1, 311) = 29.0, p < .01$, and anti-home invasion behaviors, $F(1, 311) = 14.9, p < .01$. Thus, although women perceive no more crime in their neighborhoods than men, they are more concerned about their own safety and are more likely to translate this concern into protective action.

In terms of age, neither behavioral scale was significantly affected by the respondent's age as categorized previously. However, there was some tendency for those 65 or older to score higher on the Protection Against Home Invasion scale and for those 55 or older to score higher on the Avoidance of Street Crime scale.

Our next hypothesis concerned the sensitivity of these scales to prior

victimization experience. We hypothesized that robbery/assault victims would score higher than nonvictims on the Avoidance of Street Crime index, but may not score higher on the Protection Against Home Invasion index. Our rationale was that (1) these victims are more concerned about their safety than nonvictims, and presumably are more motivated to protect themselves; (2) the behaviors comprising the Avoidance of Street Crime index are very relevant to these individuals' prior victimization, while the anti-home invasion behaviors are less relevant. The results do not support the main prediction. Robbery/assault victims and nonvictims did not differ on either scale. Hence, while robbery/assault victims perceived more crime in their neighborhoods and were more concerned about their own safety, they did not translate these concerns into the types of behavioral adaptations measured here.

A similar hypothesis was tested regarding the sensitivity of these scales prior to burglary victimization. Because these victims had suffered from home invasions, we hypothesized that they would score higher than nonvictims on the Protection Against Home Invasion index, but not on the Avoidance of Street Crime index. Again, the results did not support this hypothesis, as burglary victims did not differ from nonvictims on either behavioral scale. Thus, neither robbery/assault nor burglary seems to result in additional protective behaviors of the type being measured.

To summarize our results with regard to behavioral adaptations, we have examined the feasibility of four indices. Fifteen items were included in the final study, based on analyses of a larger pool of questions. Of the four areas, two yielded only marginal results in the preliminary study, but were included in the final study with the possibility that more favorable results would emerge in a more diversified sample. However, this did not happen. Neither the items asking about security measures taken when one is away, nor

those concerning the possession of target-hardening devices, were scalable.

A third set of items concerning home invasion measures taken when at home formed an additive scale with marginal internal consistency. Although the items comprised a unidimensional index (labeled Protection Against Home Invasion), the alpha reliability was modest (.58) and the item-total correlations were low. However, low reliability is not a fatal problem, in itself, if the index is able to demonstrate predictable relationships with other variables (although the chances of this happening are less with an unreliable measure). Unfortunately, this index was unable to demonstrate these relationships with any consistency. It was related to concern for personal safety and sex, as expected, but was unrelated to perceptions of crime, age, or prior victimization. Taken together, the results cast doubt on the validity of the Protection Against Home Invasion scale. Consequently, it is not recommended as an acceptable scale of behavioral adaptations.

In the final analysis, only one set of items formed an acceptable scale of behavioral responses to crime, namely, those directed at the avoidance of street crimes. Of the five items initially analyzed, two were only marginally related to the other three and these two even suppressed the alpha reliability of the scale. The final scale (labeled Avoidance of Street Crime) produced an alpha reliability of .80 and contained the following three items:

1. When you go out at night in your neighborhood, how often do you try to avoid certain areas? Do you do this never, sometimes, quite often, or always?
2. How often do you try to avoid certain types of people when you go out alone in your neighborhood? Do you do this . . . (same as #1).
3. How often do you walk only on certain streets when you go out alone at night in your neighborhood? Do you do this . . . (same as #1).

With one exception, this index was correlated with all other variables, as

predicted. This index was related to the Perceptions of Crime and Concern for Personal Safety scales, as well as the respondent's age and sex. However, this index was not sensitive to the experience of being victimized by robbery/assault. This finding is somewhat surprising in that robbery/assault victims perceived more crime in their neighborhood than nonvictims and were more concerned about their own safety. As we speculate in the Final Report, perhaps these behavioral coping strategies are no longer seen as effective or sufficient and the victim has turned to more drastic measures such as not going out at night or carrying a weapon. Nonetheless, the data, as a whole, suggest that this Avoidance of Street Crime scale is a unidimensional, internally consistent, reliable, and valid measure of the frequency of personal behaviors directed at protecting oneself from victimization by "street crime."

IV. RECOMMENDED RESPONSE SCALES

In this chapter, we will recommend two different response scales for different types of fear-of-crime questions. For those who elect to conduct their own methodological research rather than adopt the response scales proposed here, we are at least suggesting a methodology for scaling response options.

As noted in Chapter I, response scales are very important in the research process, but have been underrated or taken for granted. Researchers should not assume, for example, that "reasonably safe" has a scale value of three and "very safe" has a scale value of four. Furthermore, they should not assume that a "yes"- "no" response format is adequate for questions regarding protective behaviors, when less restrictive ranges can be employed to provide additional information.

To help avoid these risky assumptions, a magnitude estimation study was conducted to generate some ratio-scaled response formats for fear-related survey questions. With a ratio scale, the distances between the points on the scale are known and the scale contains an absolute zero point, indicating that none of the construct being measured is present. The distances between the points on a ratio scale indicate equal psychological distances along the continuum of interest. As Chapter II suggested, a magnitude estimation study essentially directs the respondents to scale various response options (i.e., to estimate the magnitude of each option on a scale). This procedure can be contrasted with the typical approach to scaling, where the researcher assumes that respondents think in certain ways and then proceeds to construct response scales according to this assumption.

After reviewing the literature on fear of crime and the scaling literature, we concluded that a magnitude estimation study should be used to develop optimum ratio scales for two types of adverb modifiers--those which modify the intensity of expressions and those which modify the frequency of expressions. In our judgment, intensity modifiers (e.g., "very," "slightly," "just a little") are appropriate for most of the emotional and cognitive items concerning the personal threat of crime (e.g., items addressed to the respondent's own fear or perceived risk of being victimized--"afraid," "safe," "likely"). Modifiers of frequency (e.g., "always," "once in awhile," "never") are appropriate for most items concerning protective behaviors (e.g., how often someone locks his/her doors when home alone at night), and judgments about the extent of the local neighborhood crime problem (e.g., how often vandalism occurs). The scales produced for expressions of intensity and frequency are described below, along with the criteria used to derive these scales.

Recommended scale for expressions of intensity. We will recommend a response scale containing four adverb modifiers of intensity, i.e., adverbs which modify the intensity of adjectives to which they are attached. Before describing this four-point scale, we shall provide a summary of how this particular scale was produced (without repeating the procedural details in Chapter II).

Data from the magnitude estimation study were analyzed to identify the "best" scale of intensity modifiers. Three criteria were used to define "best." First, the distances between the scale points must approximate equal intervals and be measurable at the ratio level. Secondly, the scale must be comprised of an optimum number of modifiers or response options. Optimum was defined as four to six modifiers in light of: (1) the practical

limits placed on question complexity during telephone surveys and (2) the statistical (and informational) problem associated with too much overlap of scale points. As Bass, et al. (1974) have shown, the percentage of overlap between scale points increases as the number of scale points or modifiers increase.

The third criterion used to determine an "optimum" scale was the stability of individual modifiers. The modifiers chosen to comprise the response scale should be stable in terms of (1) showing limited variability between respondents in their magnitude estimates and (2) not changing rank or distance from one another as a result of such factors as order of presentation to the respondent and sex of the respondent.

Given the above criteria for selecting the best set of adverb modifiers, the analysis procedure was fairly straight forward and was applied to both modifiers of intensity and frequency. The following steps summarize this analysis procedure:

- (1) Compute means and standard deviations for each combination of adverb and adjective.
- (2) Compute the average magnitude estimate score and standard deviation for each adverb modifier by creating a composite variable e.g., "very" = ("very afraid" + "very safe" + "very likely")/3.
- (3) Determine the scale values of several ideal ratio scales of different lengths using the above information as parameters.
- (4) Fill in each ideal ratio scale with modifiers whose actual scale values best fit the ideal scale values.
- (5) Select the scale with properties which best satisfy the criteria established.

Tables of results are provided to assist the reader in understanding how the above steps were used to arrive at the recommended scales. For the intensity modifiers, the outcome of the first two steps is shown in Table 5.

Table 5: Means (\bar{X}) and Standard Deviations (SD) for Magnitude Estimates of Intensity

| MODIFIERS | ADJECTIVES | | | | | | COMPOSITE | | |
|--------------|------------|--------|-----------|--------|-----------|--------|-----------|--------|-----|
| | AFRAID | | SAFE | | LIKELY | | \bar{X} | SD | N |
| | \bar{X} | SD | \bar{X} | SD | \bar{X} | SD | | | |
| NOT AT ALL | 4.41 | 14.48 | 7.91 | 31.18 | 6.89 | 18.91 | 6.46 | 15.08 | 204 |
| NOT TOO | 24.33 | 27.99 | 20.62 | 18.99 | 16.46 | 13.25 | 20.48 | 13.22 | 204 |
| A LITTLE | 28.19 | 29.07 | 24.04 | 15.10 | 24.98 | 18.90 | 25.71 | 15.35 | 204 |
| SLIGHTLY | 31.19 | 33.73 | 27.87 | 14.96 | 27.92 | 15.58 | 28.98 | 14.62 | 204 |
| SOMEWHAT | 50.00 | | 50.00 | | 50.00 | | 50.00 | | 204 |
| FAIRLY | 59.52 | 38.85 | 66.29 | 75.20 | 57.21 | 25.74 | 60.98 | 34.83 | 204 |
| RATHER | 71.06 | 46.20 | 67.64 | 36.36 | 69.44 | 31.27 | 69.16 | 31.13 | 204 |
| REASONABLY | 69.18 | 52.10 | 77.79 | 58.35 | 71.26 | 43.05 | 72.59 | 33.95 | 204 |
| PRETTY | 87.45 | 88.62 | 72.35 | 42.47 | 75.61 | 41.29 | 78.38 | 42.83 | 204 |
| (UNMODIFIED) | 94.21 | 104.45 | 98.76 | 107.45 | 82.81 | 46.70 | 91.35 | 67.26 | 204 |
| QUITE | 117.34 | 112.22 | 111.50 | 101.41 | 98.76 | 48.28 | 108.93 | 68.18 | 204 |
| VERY | 147.37 | 130.34 | 143.50 | 126.55 | 127.02 | 96.06 | 140.16 | 97.16 | 204 |
| HIGHLY | 155.75 | 139.39 | 147.77 | 129.95 | 136.18 | 113.09 | 146.90 | 108.91 | 204 |
| VERY, VERY | 190.27 | 144.31 | 194.09 | 155.89 | 173.88 | 127.92 | 185.08 | 125.27 | 204 |
| EXTREMELY | 199.87 | 155.73 | 197.91 | 167.38 | 183.83 | 157.54 | 194.47 | 142.03 | 204 |

Perhaps the most valuable information for constructing ratio scales is contained in the composite variable means, which are the best estimate of the overall effect of the modifiers. As shown in the column of composite means, the 14 modifiers were successful at spreading the range of scores from 6.46 ("not at all") to 194.47 ("extremely"). However, the means suggest that certain modifiers were viewed by respondents as very similar. For example, "not too," "a little," and "slightly" were all located in one region of the scale, while "rather," "reasonably," and "pretty" were close together in another area of the scale. Conversely, there were a few noticeable gaps in the scale, the largest of which occurred between "highly" and "very, very."

Using the unmodified adjectives, one can compute the extent of modification (or multiplication) that occurred as a result of each modifier. For example, "very" had a multiplicative value of 1.56 when used in conjunction with "afraid," as shown in the difference between "afraid" ($\bar{X} = 94.21$) and "very afraid" ($\bar{X} = 147.37$). Not only do these absolute values give us a better understanding of what modifiers mean to respondents, but they provide a basis for scale construction.

Based on these data, the third analytic step was performed, namely, the construction of ideal ratio scales. To provide a choice among alternative scales, the scale values of six different ratio scales were computed, as shown in Table 6. These scales are characterized by equal sized intervals and an absolute zero point. They differ in terms of the number of response options (3 to 7) and the length of the interval between response options (22.28 to 66.85 scale points). We reasoned that researchers are unlikely to use more than a seven-point scale for any given survey or questionnaire. In general, telephone survey respondents seem to experience difficulty with

Table 6. Ideal Ratio Scales for Expression of Intensity

| Modifier # | Number of Modifiers (or Points) Per Scale | | | | |
|----------------|---|--------|--------|--------|--------|
| | 7 | 6 | 5 | 4 | 3 |
| 1 | 0 | 0 | 0 | 0 | 0 |
| 2 | 22.28 | 26.74 | 33.43 | 44.57 | 66.85 |
| 3 | 44.56 | 53.48 | 66.86 | 89.14 | 133.70 |
| 4 | 66.84 | 80.22 | 100.29 | 133.70 | |
| 5 | 89.12 | 106.96 | 133.70 | | |
| 6 | 111.40 | 133.70 | | | |
| 7 | 133.70 | | | | |
| Interval Width | 22.28 | 26.74 | 33.43 | 44.57 | 66.85 |

response formats that exceed four or five response options. (The specific procedures used to generate Table 6 are summarized in Appendix A.)

The fourth analytic step was to find modifiers whose actual scale values offered the best approximation to the ideal scale values listed in Table 6. These modifiers are shown in Figure 4 as they comprise intensity scales of varying lengths.

Given a desire to avoid utilizing too many response options on telephone surveys, the four-point and five-point scales were considered the most attractive. Hence, a comparison of these two scales was pursued to discover that neither stood out as the obvious choice. Each scale had only one category that was not an excellent fit to its desired ratio scale value (i.e., "somewhat" in the five-point scale and "quite" in the four-point scale). In general, we recommend the four-point scale for measuring intensity because it is shorter and easier for respondents to answer over the telephone. This scale and its adjusted scale values are as follows:

| | |
|------------|--------|
| Not at all | 0 |
| Somewhat | 43.54 |
| Quite | 102.47 |
| Very | 133.70 |

The relative stability of the various modifiers was not a major determinant of scale selection. For example, almost all of the adverbs had consistent modifying effects, regardless of the adjective to which they were attached. As Table 5 indicates, the rank order of the modifiers does not change as a function of the adjectives, with the exception of "rather," "reasonably," and "pretty". (None of these less stable modifiers is included in the recommended four-point response scale.) Comparing each modifier to itself, most of the

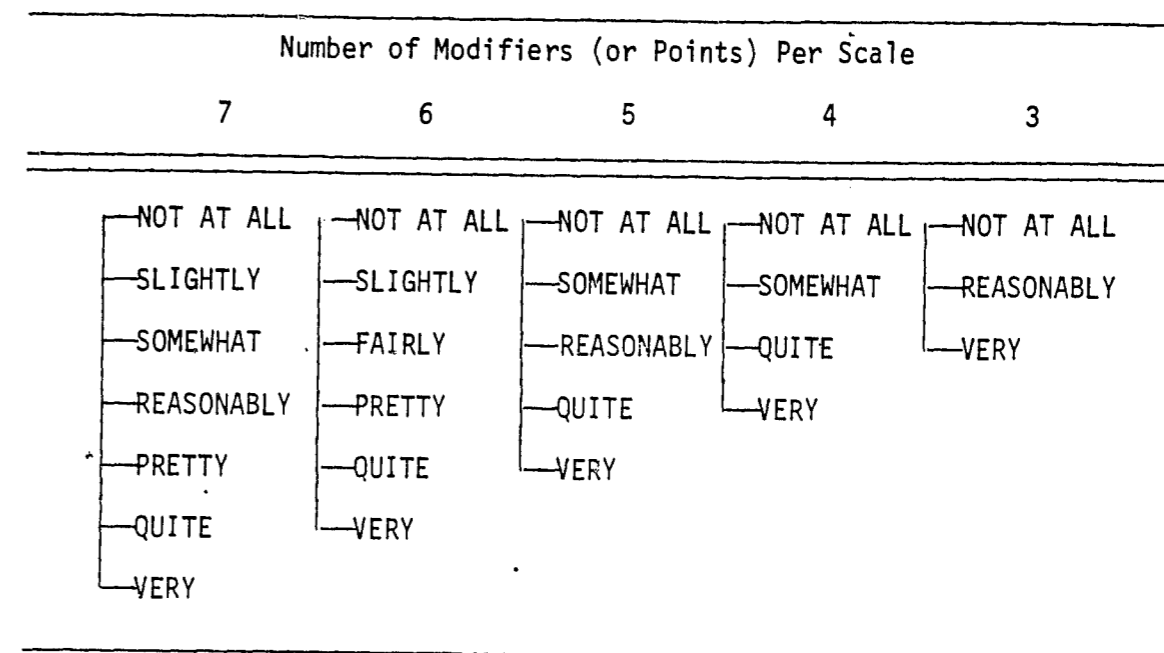


Figure 1. Intensity Scales of Various Lengths

statistical tests indicated that the scale value of each modifier did not change significantly across the three adjectives. Modifier stability was also examined in terms of possible effects due to the order in which modifiers were presented to the respondents. Order did not prove to be an important threat to the choice of modifiers.

Finally, we studied the variability or differences between respondents in the scale values which they assign to a given modifier, under the assumption that stable modifiers are more likely to have the same meaning for different respondents. However, the standard deviations did not discriminate between the selected and unselected modifiers.

The reader should note that the unmodified adjectives (i.e., "afraid," "safe," "likely") were not included in any of the proposed ratio scales. We felt that unmodified terms are generally overused by respondents, who often see such options as easy, catch-all answers to potentially difficult questions.

In summary, four adverb modifiers of intensity -- "not at all," "somewhat," "quite," and "very" -- are recommended from a pool of 14 modifiers to comprise a four-point response scale for affective and certain cognitive items concerning fear of crime. This response scale satisfies the basic criteria of: approximating a ratio scale; having an optimum number of response alternatives (as defined by both practical and statistical concerns); and having a stability at least equivalent to other scales generated from the available pool of modifiers.

Recommended scale for expressions of frequency. The second response scale is recommended for expressing different levels of frequency, especially the frequency with which respondents engage in various behaviors to protect themselves and their property against crime. Table 7 shows the magnitude

Table 7. Means (\bar{X}) and Standard Deviations (SD) for Magnitude Estimates of Frequency (Percentage of Time)

| Modifiers | PROTECTIVE BEHAVIOR ITEMS | | | | | | | | | | | | | | | | | | | |
|----------------|---------------------------|-------|----|------------------------|-------|----|---------------------------|-------|----|-------------------------------|-------|----|------------------------|-------|-----|----------------------------|-------|----|-----------|-------|
| | AVOID TYPE OF PEOPLE? | | | LOCK DOORS WHEN ALONE? | | | TILL SOMEONE RETURN TIME? | | | KEEP WINDOWS LOCKED AT NIGHT? | | | DON'T GO OUT AT NIGHT? | | | STOP DELIVERIES IN ABSENCE | | | COMPOSITE | |
| | \bar{X} | SD | N | \bar{X} | SD | N | \bar{X} | SD | N | \bar{X} | SD | N | \bar{X} | SD | N | \bar{X} | SD | N | \bar{X} | SD |
| Never | 5.8 | 12.46 | 10 | 0.81 | 2.40 | 21 | 3.90 | 13.88 | 21 | 0.36 | 1.72 | 75 | 0.42 | 2.51 | 102 | 0.56 | 2.70 | 84 | 0.80 | 2.74 |
| Once in awhile | 14.46 | 8.04 | 39 | 13.86 | 8.72 | 36 | 17.14 | 10.93 | 52 | 17.30 | 10.32 | 39 | 14.52 | 7.38 | 42 | 17.11 | 19.34 | 19 | 15.73 | 9.54 |
| Sometimes | 33.65 | 14.24 | 33 | 38.33 | 10.47 | 15 | 40.12 | 14.66 | 43 | 44.35 | 12.64 | 23 | 39.26 | 17.16 | 23 | 45.57 | 12.77 | 14 | 39.76 | 13.70 |
| Quite often | 62.84 | 15.18 | 38 | 62.15 | 13.40 | 19 | 70.00 | 10.80 | 31 | 69.77 | 14.67 | 17 | 67.50 | 17.20 | 10 | 59.56 | 16.69 | 16 | 65.44 | 14.33 |
| Frequently | 86.52 | 7.45 | 38 | 88.39 | 9.45 | 33 | 84.41 | 14.29 | 34 | 81.48 | 20.89 | 27 | 82.53 | 17.56 | 19 | 83.07 | 16.11 | 27 | 84.13 | 14.16 |
| Always | 99.36 | 2.51 | 45 | 99.68 | 1.41 | 78 | 99.82 | 0.50 | 22 | 99.52 | 2.18 | 21 | 97.14 | 7.60 | 7 | 98.90 | 3.79 | 41 | 99.27 | 2.67 |

estimates of frequency produced by six different frequency modifiers when applied to six different questions about protective behaviors. For example, the table indicates that 39 respondents reported that "once in awhile" they try to avoid certain types of people when they go out alone at night. When asked how often is "once in awhile," on the average they reported 14.60 percent of the time. The composite variable shows that "once in awhile" generally meant 15.73 percent of the time. In comparative terms, "once in awhile" generally meant less than half as often as "sometimes" ($\bar{X} = 15.73\%$ vs. 39.76%). The six adverbs were successful at producing noticeably different levels of frequency in the minds of the respondents, as illustrated by the spread of composite scores from .80 to 99.27.

The process of generating ratio scales and selecting the most suitable scale is nearly the same as that described earlier for intensity scales. Table 8 shows four alternative sets of ratio scale values that might be used, ranging in length from three to six scale points. Comparing these ideal ratio scale values to the actual scale values, the "goodness of fit" can be seen once again.

Although the entire set of six modifiers represents a fairly good approximation to a ratio scale having equal intervals, the six-point scale was judged to be too long for most telephone surveys. Comparing the four-point and five-point scales, the former best satisfied the equal intervals criterion and should be easier for respondents to answer (see Figure 2). The primary drawback of the five-point scale is that the actual scale values do not closely match the ideal scale values for a ratio scale. Therefore, we recommend the following four adverb modifiers, accompanied by their adjusted scale values, as a scale for measuring the frequency of various behaviors or

Table 8. Ideal Ratio Scales for Expressions of Frequency

| Modifier # | Number of Modifiers (or Points) Per Scale | | | |
|----------------|---|-------|-------|-------|
| | 6 | 5 | 4 | 3 |
| 1 | 0 | 0 | 0 | 0 |
| 2 | 19.69 | 24.62 | 32.82 | 49.23 |
| 3 | 39.39 | 49.23 | 65.65 | 98.47 |
| 4 | 59.08 | 73.85 | 98.47 | |
| 5 | 78.78 | 98.47 | | |
| 6 | 98.47 | | | |
| Interval Width | 19.69 | 24.62 | 32.82 | 49.23 |

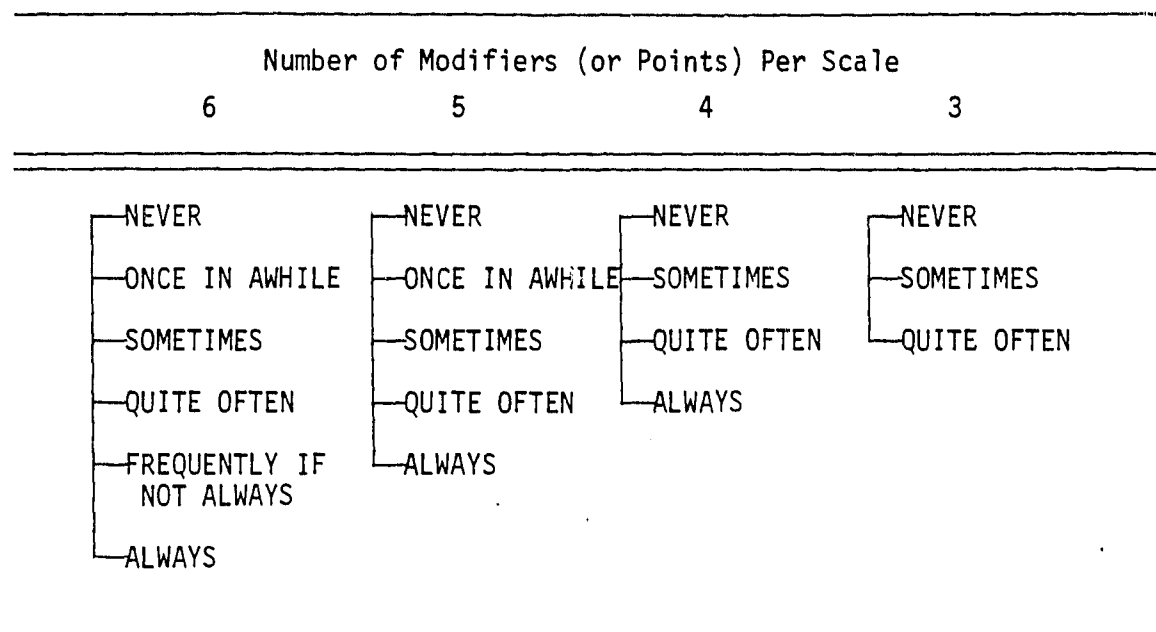


Figure 2. Frequency Scales of Various Lengths

events:

| | |
|-------------|-------|
| Never | 0 |
| Sometimes | 38.96 |
| Quite Often | 64.64 |
| Always | 98.47 |

These four adverbs, as well as the two adverbs not selected, demonstrated fairly stable effects across the six items, as shown in Table 7. The rank order of the modifiers did not change across the six questions, nor did the scale values show any statistically significant fluctuations. Furthermore, the modifying effect of the adverbs did not change as a function of the order of presenting questions or the order of the modifiers themselves. Thus, stability was good for all the modifiers and did not serve as a selection criterion which discriminated between modifiers. To summarize, the four adverb modifiers of frequency were selected primarily because they comprise a scale of practical length which approximates the properties of a ratio scale with equal intervals.

Comment on scale values. We anticipate that some researchers who are interested in using the two scales proposed in this chapter will ask themselves: "Is it necessary that I use the exact scale values listed here for coding/analyzing my survey data?" Researchers who adopt these four-point scales can use (1) the exact scale values, (2) the ideal scale values, or (3) scale values derived from either (1) or (2) by applying a numerical constant. Although the exact scale values (or some derivative of these) would be the best estimate of "real" scale values, in our judgment, the ideal values for the respective four-point ratio scales would also be acceptable (see Tables 6 and 8). In any event, the psychological distances between the scale points should be preserved.

FOOTNOTES

1. We wish to thank the following individuals who provided us with valuable feedback as members of our Advisory Panel: George Silberman, National Institute of Justice; Wesley Skogan, Northwestern University; Floyd Fowler, University of Massachusetts; Michael Maltz, University of Illinois at Chicago Circle; and Richard Taub, University of Chicago.
2. Actual behavior is less subject to misinterpretation than self-reported behavior, but survey research limits us to respondents' self-reported behavior.
3. Due to a mistake in preparing the reliability retest instrument, the items comprising the Avoidance of Street Crime scale were not included in the retests. Hence, no test-retest reliability coefficients are presently available on this particular scale.
4. The reason we expected the Protection-Against-Home-Invasion scale to be less affected by the antecedent conditions than the Avoidance-of-Street-Crime scale is that the latter scale contains the same street offenses and situations as the Perceptions-of-Crime scale. The Home Invasion scale focuses on protective measures to prevent access to one's home. In general, this prediction was supported.
5. The procedures used to compute the adjusted scale values in Table 6 are described in Appendix A.

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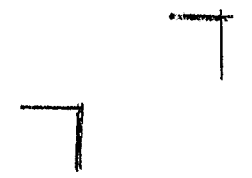
APPENDIX A

PROCEDURES FOR GENERATING IDEAL RATIO SCALES SHOWN IN TABLE 6

Several steps were needed to generate the ratio scales presented in Table 6: After determining an appropriate range in the number of modifiers (three to seven), we decided to establish a limit on the extremity of modifiers that would be acceptable for inclusion. A decision was made to use "very" as the end of the scale rather than "highly," "very, very," or "extremely," even though "very" does not intensify or stretch the meaning of adjectives as much as the other modifiers. The primary reason for this decision was that we expected very few, if any, respondents to select these more extreme response categories. Data from our preliminary study suggested that we would experience enough difficulty getting respondents to use the "very" category.

Having determined the acceptable number and range of modifiers, the ratio scaling procedure was then conducted to produce the numbers shown in Table 6. First, the scale values for all modifiers were adjusted so that a ratio scale, with a zero (0) origin, could be obtained. Thus, 6.46 was subtracted from all composite scale values so that "not at all" would equal 0 and "very" would equal 133.70. Secondly, the interval lengths between categories were computed for each of the six scales by dividing the length of each scale (133.70) by $K-1$, where K equals the number of modifiers or response categories in the scale. For example, the interval length between the categories of a seven-point scale is 22.28 (or $133.70 \div 6$). Finally, when the interval length for each ratio scale has been determined, the values for each point on the scale were computed.

These values, shown in Table 6, served as the basis for selecting various modifiers to construct ratio scales of different lengths (see Figure 1).



END