A SOCIAL PSYCHOLOGICAL INVESTIGATION OF ATTITUDES OF VIRGINIA SPORTSMEN TOWARD GAME LAWS AND REGULATIONS

by

Kirk Harold Beattie

Dissertation submitted to the Graduate Faculty of the
Virginia Polytechnic Institute and State University
in partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY

in

Fisheries and Wildlife Sciences

APPROVED:

R. H. Giles, Jr., Chairman

G. J. Duhy

D. J. Shoemaker

J. D. Wellman

A. R. Tipton

May, 1979

Blacksburg, Virginia

6

ACKNOWLEDGEMENTS

I would like to express sincere appreciation to my committee chairman, for the professional guidance and stimulation he has provided the past three years. It has been an honor and a privelege to work with him.

I would also like to thank my other committee members, and for the expertise they kindly made available from their respective disciplines. was especially helpful in the expert counseling he provided related to survey research. and were extremely helpful in the early stages of this research.

Financial support for this research was provided by the Georgia Division of Fish and Wildlife, National Rifle Association, National Wildlife Federation, South Carolina Wildlife and Marine Resources Department, Tennessee Wildlife Resources Agency, Virginia Commission of Game and Inland Fisheries, Wildlife Management Institute, and American Petroleum Institute. The support of these organizations is gratefully acknowledged. The National Wildlife Federation generously contributed to my graduate training by awarding an Environmental Conservation Fellowship for fiscal years 1976-77, 1977-78, and 1978-79.

I wish to thank my parents, and and for instilling in me a value of formal and self-taught education. My graduate education would not have been possible without their unswerving financial and moral support.

Last, and certainly foremost, I wish to express heartfelt appreciation to my wife for her help and sacrifices over the past five years.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

INTRODUCTION

Laws and regulations restricting the time and methods of harvest of game animals have played an important role in the evolution of game management. The first game law in North America was enacted 300 years before the purposeful modification of game habitat by state game and fish agencies. The present-day importance of game laws and regulations is attested to by the fact that almost one-third of the operating budgets of state fish and wildlife agencies are expended on enforcement of wildlife (primarily game) and fisheries laws (Morse 1976).

The success or effectiveness of game laws and regulations has been measured or inferred by monitoring changes in numbers of game animals, by measuring sportsmen compliance with game laws, and by measuring sportsmen attitudes toward game laws and regulations. Attitudes of sportsmen toward game laws and regulations would seem to be important to a wildlife management agency because of presumed close ties between the attitudes of the clientele and related behaviors of interest to the agency.

Hunter attitudes toward a particular law or regulation may be related to their willingness to comply with the law or regulation. For example, several years ago the Colorado Division of Wildlife passed a regulation prohibiting the harvest of single-antlered bull elk (Cervus canadensis) for

one hunting season. The intent of the law was to make more branch-antlered bulls available to sportsmen during the following year. However, reports of illegal harvest of single-antlered elk and results of post-season elk carcass surveys indicated the kill of single-antlered elk was probably near to what would have occurred had it been legal to harvest single-antlered elk. Sportsmen attitudes toward this regulation undoubtedly played a major role in the repeal of the regulation prior to the following year's elk hunting season.

Previous attitude studies related to game laws and their enforcement have tended to concentrate on measuring attitudes and identifying personal and social group characteristics associated with attitudes of varying intensity. These studies provide descriptions of attitudes among social groups but do not provide information on manipulable factors influencing whether people have favorable or unfavorable attitudes. Because the purpose of attitude measurement is often to discover how to modify unfavorable attitudes, it is necessary to proceed beyond measurement and to investigate factors influencing the favorability of attitudes.

Attitude favorability refers to the polarity and extremeness of a person's attitude. Interpretation of polarity in terms of favorability may depend on the nature

of the attitude issue or object under consideration. Opposition to an issue considered undesirable by a majority of citizens is referred to as a favorable attitude whereas support of an issue considered undesirable by a majority of citizens is considered as an unfavorable attitude. Attitude favorability depends on the polarity of affect and may depend on the nature of the attitude issue or object.

Studies have shown that attitude favorability is related to a person's knowledge about and perception of an attitude object. This knowledge and these perceptions are called cognitions. An attitude object is any discriminable aspect of the environment. This relationship between attitudes and cognitions is supported by studies in which by modifying the polarity of a person's existent cognitions and introducing cognitions favorable to the attitude object, increases in favorability have resulted. Studies of this nature are reported later.

An understanding of cognitions is desirable for understanding the nature and function of attitudes and is central to theories of attitude stability and change. Rokeach (1968) has suggested that the nature and function of attitudes can be better understood and predicted by investigating the cognitive systems in which an attitude is imbedded. In line with Rokeach's statement, Heberlein (1973:23) wrote, "Before a [natural resource] user study

can have any strong application it has to show just what people believe, how they feel about these beliefs, and how these beliefs and feelings are related."

The manner in which cognitions interact to influence the polarity and extremeness of attitudes is undergoing intensive investigation in social psychology. Many different models have been presented to explain the nature and dynamics of attitudes. Previous investigators in social psychology have normally limited their research to the potential application of one model to one attitude. However, to standardize for the specific attitude under consideration, it was felt desirable to compare several social psychological models in this research.

Although a comparison of social psychological models was not intended to be directly applicable to the activities of wildlife management agencies, measuring attitudes and determining correlates of attitudes was intended to provide information applicable to agencies. Many wildlife management agencies use the results of attitude measurement studies to gauge the effectiveness of their programs. Alghough the link is not often documented, a decline in favorable attitudes toward a program is perceived as being the result of a deficiency in the program. Subsequent attitude measurement studies can indicate the degree to which program deficiencies have been

corrected.

The primary objectives of this research were:

1. To compare the ability of three social psychological models to predict the attitudes of Virginia hunters toward game laws and regulations.

2. To measure attitudes of Virginia hunters toward game laws and regulations, game law enforcement, Virginia game wardens, game law violations, and sportsmanship in hunting.

3. To determine correlates of attitudes of Virginia hunters toward game laws and regulations, game law enforcement, Virginia game wardens, game law violations, and sportsmanship in hunting.

4. To establish a base datum for future analyses of attitude change.

LITERATURE REVIEW

This section will review a major study of hunting satisfactions, will discuss the concept of attitudes, will discuss the semantic differential procedure of attitude scaling, and will present and compare three social psychological models of attitudes.

Studies of hunting satisfactions are discussed because hunting satisfaction items will represent the components of one part of a social psychological model used for predicting attitudes of Virginia hunters toward game laws and regulations.

A discussion of the semantic differential is included because it will be employed to measure the attitudes of Virginia hunters toward five attitude objects associated with the game law enforcement complex.

Fishbein's beliefs-based model, Rosenberg's values-based model, and Fishbein's subjective norm concept are extensively reviewed because they represent models to be employed as predictors of attitudes of Virginia hunters toward game laws and regulations.

Attitude Studies in Wildlife Law Enforcement

Attitudinal studies related to wildlife law enforcement have been conducted by Amidon (1968), Beattie (1976), Haulsee (1973), Kesel (1974), Melnyk (1977), Ritter (1975), and Stoll (1975).

Amidon (1968) conducted a mail survey of official deer law violators and hunters assumed to be nonviolators in New York to determine if attitudes and characteristics were different between the two groups. Although statistically significant differences occurred in several variables between the two groups, Amidon (1968) concluded that convicted deer law violators did not differ "significantly" from unconvicted hunters. Seventy-one percent of combined respondents reported that hunting regulations did not place unnecessary limitations on their deer hunting satisfaction. However, nearly one-half of the respondents in each group reported that hunting regulations placed too much emphasis on tagging, use of licenses, and legal technicalities (Shafer et al. 1972).

Beattie (1976) surveyed 104 Mississippi residents who had reported a wildlife law violation and questioned them about 1) the effectiveness of enforcement, 2) the fairness of enforcement, 3) the number of arrests made in their county, 4) the appropriateness of the dollar amount of fines assessed violators, 5) their feelings toward game laws, 6) their feelings toward violations of game laws, and 7) their perceptions of the frequency of violations in their county of residence. Those who reported violations generally thought enforcement was ineffective but fair, game wardens made too few arrests, and fines were too low.

Most respondents held a favorable attitude (supported or approved of) toward game laws, opposed violators, and reported that "a lot" of wildlife violations occurred in their residence county.

Haulsee (1973) mailed a five-page questionnaire to a one percent sample of licensed Michigan deer hunters. Three of the questionnaire items were related to wildlife law enforcement. About one-half of the hunters thought conservation officers did a good job of enforcing game laws, 40 percent thought officers did a fair job, and 14 percent suggested officers performed poorly. When asked if better law enforcement would improve their chance of bagging a deer, 53 percent of the hunters responded affirmatively. The question most relevant to wildlife law enforcement asked "Do you support the current game laws and regulations?" Sixty percent of the hunters "strongly supported" game laws, 20 percent "slightly supported," 10 percent "slightly opposed," and the remaining 10 percent "strongly opposed" game laws and regulations.

Kesel (1974) included wildlife law-related attitude questions in a questionnaire mailed to convicted violators and nonviolators of Michigan deer laws and regulations. A majority of nonviolators felt that typical Michigan conservation officers liked "people" and their job, thought they were liked by community members, felt more officers

were necessary, suggested there were enough game laws, and, strongly opposed game law violators.

Melnyk (1977) studied aspects of how attitudes were formed by known Alberta wildlife law violators and nonviolators toward wildlife laws and wildlife officers. Melnyk hypothesized that attitudes toward wildlife laws and officers would be influenced directly by quality of contact with wildlife officers and indirectly through values acquired through socialization and the attitudes of significant others. Attitudes of known wildlife law violators and nonviolators toward laws and officers were significantly different ($P<0.05$). Although attitudes of members of the two groups were statistically different, total attitude score distributions pertaining to each attitude object tended to be very favorable for both groups.

Self-reports of the quality of contact with wildlife officers were positively correlated with attitudes toward wildlife laws ($rho=0.345$, $P<0.001$) and wildlife officers ($rho=0.632$, $P<0.001$). When examining indirect influences on attitudes, Melnyk found a small correlation ($rho=0.157$, $P<0.001$) between wildlife law attitudes and perceived attitudes of "significant others" (close friends and relatives who hunt) toward wildlife laws. The correlation was higher ($rho=0.433$, $P<0.001$) between attitudes toward

wildlife officers and perceived attitudes of significant others toward wildlife officers. Differences in favorability of attitudes toward wildlife laws were not related to differences in general values among hunters (using Rokeach's 18 instrumental values). The only background factor significantly associated ($P<0.05$) with wildlife law attitudes was residence (rural versus urban). Both age and residence were associated with attitudes toward wildlife officers.

Ritter (1975) interviewed 174 Virginia Polytechnic Institute and State University students who were residents of Virginia and had hunted and/or fished before. The majority of students interviewed reported that warden contacts had been pleasant, game laws were relatively easy to understand, and warden inspections did not spoil the fun of hunting and fishing.

Stoll (1975) mailed a questionnaire to a 10 percent systematic sample of all persons arrested in Michigan for breaking a natural resource law in 1973. The majority of respondents suggested there were enough game laws, conservation laws were not too complex, and conservation laws were not too strict. An interesting finding was that 56 percent of the respondents reported they were unaware of the existence of the law for which they were arrested for violating.

Much of the previously cited literature concerning wildlife law enforcement-related attitudes of various publics suggests that a majority of relevant individuals have favorable attitudes toward game laws, the number of game laws, and the necessity of game laws. However, this finding appears contradictory (assuming attitude-behavior consistency) to results of self-reported violation studies of sportsmen which have tended to indicate that wildlife law violations are frequently made by many people among the populations surveyed. For example, Smith and Roberts (1976) reported that about one-half of 6,000 waterfowl hunting season participants admitted to violating a regulation on waterfowl shooting hours during the 1973-74 season. Christie et al. (1965) reported that over one-half of their sample of 17-20 year-old Oslo, Norway, males admitted to having committed one or more wildlife law violations. Almost 75 percent of a sample of western U.S. high school students/hunters surveyed by Short and Nye (1958) admitted to having violated one or more game laws. However, investigators employing McCormick's (1968) compliance rate procedure have reported that wildlife law violations are committed by much less than 50 percent of sportsmen (Gibault 1970, Stork and Walgenbach 1973). McCormick's technique basically involves multiplying total man-days of resource use during a specified period by the

known violation rate per hunter contact to arrive at estimated violations.

This apparent incongruence between reported attitudes of sportsmen and estimates of the percentage of sportsmen complying with game laws may or may not be real. Both self-report and compliance rate procedures have not yet incorporated procedures for validating estimates on dependent variables, and thereby critics may question the accuracy of measurements. Also, all of the studies reporting attitudes of sportsmen toward game laws and related concepts have employed single-item measures of attitudes. Single-item measures are generally less reliable, less capable of differentiating individuals, and less capable of specifying the attitude domain than are multiple-item measures (Lemon 1973). Consideration of other factors precludes a realistic comparison between findings of attitude and violation behavior studies (e.g., different populations sampled, different age groups sampled, questionable representativeness of samples).

Nature and Organization of Attitudes

Definitions of "attitude" are said to be as numerous as social psychologists. A review of definitions of attitude almost 40 years ago by Nelson (1939) placed the number at 23, and the number has probably grown since then. Rhine's (1967:382) comment on the plethora of definitions

of attitude was "No one definition seems clearly superior solely on logical grounds; if it were otherwise, there would not be so many alternatives."

There are basically three different nature-of-attitude schools of social psychology. Two of the schools are dominant and the third is in the background.

The first school has been named the "tripartite" school by Oskamp (1977). Members of this school view attitudes as having three components: cognitive, affective, and behavioral (Krech et al. 1976, Secord and Backman 1964). The cognitive component consists of the beliefs, opinions, values, and thoughts which the attitude-holder has about the attitude object.[1] The affective or emotional component refers to an individual's feelings or emotions toward an attitude object. The affective component is normally considered synonymous with evaluation (like-dislike) of an attitude object. The behavioral component consists of a person's action tendencies (behavioral intentions) toward an attitude object.

Oskamp (1977) and Scheibe (1970) have suggested that the thought-emotion-behavior distinction can be traced back

---

[1] Attitudes have been, and frequently still seem to be, confused with opinions, beliefs, and values. An overview of previous contrasts and comparisons among the four concepts will not be provided because it would not greatly add to the central objectives of this study.

to Plato, who used the terminology of cognition, affection, and conation. Krech et al. (1962) based their tripartite position on a review of the attitude literature which indicated that the average correlation among the components, across studies, was only about 0.5. As an example of the tripartite view, Fishbein (1967a) stated that an "attitude" toward segregation would include not only a person's negative evaluation of segregation, but also his ideas about its causes and implications (cognition), and his conviction that it should be attacked through legislation (conative).

Although not named in the attitude literature, the second school might be called the "separationist" school. Proponents of this school include (or have included) Chein (1967), Droba (1933), Fishbein and Ajzen (1972), Osgood and Tannenbaum (1955), and Thurstone (1932, 1967). Fishbein and Ajzen (1972) contended that an attitude does not consist of affective, cognitive, and behavioral components but suggested that the term "attitude" be reserved solely for the affective (evaluative) dimension. The authors' basis for adopting a separationist stance (theoretically and empirically) was that there is no necessary congruence among beliefs, attitudes, and behavioral intentions. Bem (1970:14) simply described the essence of the separationist school's viewpoint when defining attitudes as "likes and

dislikes." A recent review of the attitude literature by Oskamp (1977:9) concluded: "In recent years the evaluative aspect of attitudes has been increasingly stressed [and] an attitude is now generally seen as a disposition to respond in a favorable or unfavorable manner to given objects." This same viewpoint has been expressed by Heise (1970:248): "What we mean by attitude, both in theory and in measurement, is simply the affective reaction to an object" and by Lemon (1973:104): "Attitude is only strictly concerned with people's evaluative responses to an object."

The most popular definition of attitude, as judged by its frequency of citation, is Allport's 1935 definition, reprinted in Allport (1967:8): "An attitude is a mental or neural state of readiness, organized through experience, exerting a directive or dynamic influence upon the individual's response to all objects and situations in which it is related." McGuire (1969) has published a detailed presentation of the implications of every aspect of the definition. The central feature of Allport's definition is the idea of readiness for response. That is, attitude is <u>not</u> behavior but is a <u>predisposition</u> to behave in a certain way toward an object. The response predisposition nature of attitude is distinguished from other states of readiness (e.g., habit) in that it predisposes toward an <u>evaluative</u> response. Allport also

stressed the motivating force of attitudes in determining or influencing behavior toward an attitude object. The motivating force of attitudes is closely tied to their hypothesized function as mediators of behavior. That is, the construct of attitude is invoked to explain or account for the relationship between a stimulus and a response (Doob 1967). McGuire (1969) cited an example in which the concept of prejudiced attitude is invoked to explain why a person reacts to the picture of a black person or a black person (stimulus) by an increase in galvanic skin response or by moving to a different chair (response).

Fishbein (1967b) intimated that although many attitude researchers pay "lip service" to the tripartite view of attitude, it is usually only evaluation or the affective aspect that is measured and treated by researchers as the essence of attitude. Shaw and Wright's (1967:13) thoughts on the nature of attitude provide the clearest summary of the separationist school's conception of attitude:

> Our conception rejects the notion that attitudes are composed of three components. Rather, the affective reactions specified by the traditional analysis constitute the attitude; the traditional cognitive component provides the basis for an evaluation and, thereby, for the attitude; and the attitude predisposes the individual to act in a certain manner toward the attitude object.

The third school might be termed the "all-are-the-same" school. It does not seem to have gained much momentum because it appears to be advocated by only one

individual, William McGuire. McGuire (1969) surveyed the literature on attitudes and concluded that the affective, cognitive, and conative "components" of attitude have proven to be so highly intercorrelated that a distinction should not be made among them. Krech et al. (1962) reported an average correlation of 0.5 among the three components in their review, a finding not supportive of McGuire's statement of "highly intercorrelated." Also, there does not seem to be much theoretical support for McGuire's all-are-the-same school.

The separationist view of the nature and organization of attitudes was adopted in this research. As discussed later, attitudes are reported to be affected by values relevant to the attitude object. Hunting satisfactions would thus seem relevant to attitudes toward game laws and regulations.

Hunting Satisfactions

Hendee and Potter (1971), in their review of 600 people-wildlife publications, reported that a definitive study of hunting satisfactions had not been conducted. Apparently in response to their own suggestion, they later conducted what has to date been one of the most comprehensive studies of hunting satisfactions (Potter et al. 1973). All earlier and later studies have tended to concentrate on only satisfactions received while hunting.

The Potter et al. study is notable for being one of the few studies to include hunting-related satisfactions relevant to Clawson's five-step recreation model: anticipation, traveling to area, on-site recreation, returning home, and recollection or reflection.

Potter et al. (1973) mailed a hunting satisfaction questionnaire to a sample of Washington hunters during 1971. Respondents judged the extent to which each of 73 elements of hunting satisfaction added to or detracted from personal hunting satisfaction on a nine-point Likert scale (a scale from extremely adds to extremely detracts). Factor analysis, "intuition," and two forms of item analysis resulted in the elimination of about 50 percent of the 73 items and the aggregation of items into 11 dimensions of hunting satisfaction. Three of the 11 dimensions were based on single-item scales and the remainder were based on multiple-item scales. The 11 dimensions identified were nature, escapism, companionship, shooting, skill, vicariousness, trophy-display, harvest, equipment, outgroup verbal contact, and outgroup visual contact. The nature dimension was perceived as being most important by hunters while outgroup visual contact was either neutral or detracted from hunting for 64 percent of the hunters. In contrast to studies obtaining single ratings on major satisfaction dimensions (Hampton and Lackey 1975, Klessig and Hale 1972, Moeller and Engelken

1972), Potter et al. (1973) obtained single ratings on many items within each major dimension. Obtaining ratings on many items may have provided for greater differentiation among respondents, may have increased the content validity of dimensions, and enabled estimation of the reliability of measurement of each of eight dimensions (three of the dimensions contained a single item). The exhaustiveness of Potter et al.'s satisfaction items is indicated by the presence of items such as "dressing out game" and "having a drink after a hunt."

Semantic Differential and Attitude Measurement

The Semantic Differential (SD) measures people's reactions to stimulus words or concepts in terms of ratings on seven-point bipolar scales defined with contrasting adjectives at the endpoints (Osgood et al. 1957). An example of an SD scale is:

Good _____:_____:_____:_____:_____:_____:_____ Bad
3 2 1 0 1 2 3

Usually, the scale step 0 is labeled "neutral," the 1 steps are labeled "slightly," the 2 steps are labeled "quite," and the 3 steps are labeled "extremely." Scale steps are not numbered in actual scaling. A person is typically presented with a concept or stimulus word(s) such as "United States" and asked to rate it on a number of SD scales. Although each single scale is a SD, normally the final set of scales associated with a concept are referred

to collectively as the SD. Osgood et al. (1957) originally had 100 subjects rate each of 20 concepts on 50 scales. The authors performed a factor analysis, with rotation, on the resulting matrix of intercorrelations and concluded that three dominant factors were present. The first factor, named "evaluative," contained 15 scales with high loadings (e.g., good-bad, valuable-worthless), and accounted for 69 percent of the common variance. The second factor was named "potency;" it consisted of scales such as large-small, strong-weak, and heavy-light, and accounted for 16 percent of the common variance. Osgood et al. named the final factor "activity" because of the presence of highly-loaded scales such as fast-slow, active-passive, and hot-cold. The activity factor accounted for 13 percent of the common variance.

Although SD scales were derived initially as measures of the basic components of meaning, they have been frequently used as measures of attitude. In this regard, Osgood et al. (1957:194-195) stated:

> The evaluative factor of the semantic differential is an index of attitude. Although it does not tap much of the content of an attitude in the denotative sense, it does seem to provide an index to the location of the attitude object along a general evaluative continuum.

When the SD is used as an attitude measurement device, the usual procedure is to:

1. Select a set of bipolar scales previously shown to have high factor loadings on an evaluative dimension.

2. Have pretest subjects rate each of the scales on one or more concepts.

3. Assign integers ranging from seven (extremely on the positive side) to one (extremely on the negative side), treat the scale steps as equidistant, and perform an item analysis on scales within each concept.

4. Submit the final set of scales to subjects, compute a total or mean score for each subject for each concept, and describe the distribution of scores and/or compare SD-measured attitudes with other variables.

In their original presentation of the SD procedure, Osgood et al. (1957) reported that the intensity with which an attitude is held will be equal to extremeness of judgement on the evaluative dimension. Weskel and Hennes (1965) conducted a study designed to test Osgood's intensity-equals-extremeness statement. The authors obtained correlations between SD polarization (extremeness) scores and independently-measured intensity scores for two samples of college students and samples of sixth- and tenth-grade students. Correlations were generally low (0.31, 0.43, 0.47, and 0.62) and it was concluded that SD polarity scores should not be equated with attitude intensity.

In an earlier study, Mehling (1959) asked respondents to circle a number between one and nine corresponding to the "strength of their feeling" associated with their rating of a concept on a SD. When "intensity" mean ratings were plotted against polarity mean ratings, a V-shaped curve resulted, with the apex of the V occurring at the

neutral point. Mehling (1959) concluded that the SD does measure both the direction and intensity of attitude. Mehling's results suggest that the intensity with which an attitude is held will be equal to extremess of judgement on an evaluative dimension.

Because the findings of these and other studies are contradictory, it seems that a conservative approach to their use and interpretation is in order. The SD seems useful only as an expression of attitude direction and as a procedure for measuring extremeness of attitudes, not attitude intensity. Until studies sufficiently document the relationships of attitude intensity and extremeness, the SD seems most useful only as a measure of attitude direction and extremeness.

An important aspect of scaling procedures is the level of measurement of variables they yield or are purported to yield. There are four generally recognized levels of measurement, namely nominal, ordinal, interval, and ratio. Osgood et al. (1957) and virtually all persons employing the SD as an attitude measurement procedure have treated single SD's and total evaluative scores as an interval level of measurement. Critics contend that subject-centered summative scales (such as SD's) result only in ordering of respondents and that it is not valid to employ mathematical and statistical techniques which assume that measures constitute an interval scale (Babbie 1973, Selltiz

et al. 1976, Tull and Albaum 1973). Most proponents of treating SD results as interval data do not offer empirical evidence for the equidistance of scale steps but support their contention by means of logic and comparison of simulated consequences of treating a variable as ordinal or interval (Boyle 1970, Labovitz 1967, Nunnally 1967, Zinnes 1969). In support of their interval treatment of SD scores, Osgood et al. (1957:152) cite a study by Cliff (1956) in which it was reported that the adverbial quantifiers "slightly," "quite," and "extremely" associated with SD's yield almost equal increasing degrees of extremeness in experimental rating tasks. Based on perceived adverbial-distance rating tasks, Howe (1962, 1966a, 1966b) concluded that the adverbs employed by Osgood do define approximately equally-spaced rating positions. A later study by Cliff (1959) corroborated the findings of his dissertation research and supported the approximate equidistance of the adverbs: slightly, quite, and extremely. A study by Wells and Smith (1960) is also supportive of Osgood's contention. Wells and Smith (1960) found that the amount of differentiation in SD ratings was greater when adverbial labels (slighly, quite, extremely) were used; no labels led to many more ratings at the endpoints of the scales.

Heise (1970) suggested that two basic criteria enter into SD scale selection: relevance and factorial

composition. According to Heise (1970), people find it easier to rate concepts on scales which appear relevant and which make distinctions which are familiar. Heise (1970) also recommended the use of factor analysis for selecting factorially pure scales for each concept.

Brinton (1961) presented a method of selecting specific adjectives to be used in an attitude scale based on SD data. Brinton classified a group of subjects into those favoring and those opposing capital punishment. A mean for each group was computed on each of 16 SD scales and the magnitude of the difference between means used as a method for selecting a final set of scales. Brinton's procedure is a variation of the item discrimination method used with Likert scales in which mean responses are compared on each item between individuals having total scores in the lower and upper 27 percent of the total score distribution. It is interesting to note that some of the adjectives which Osgood et al. (1957) reported to have high loadings on an evaluative dimension (e.g., beautiful-ugly) did not produce large mean differences between the two groups of Brinton's study.

An assumption of the SD procedure appears to be that logical opposites of SD scales will maintain their same meaning when used to measure attitudes toward different concepts. Carter et al. (1968) tested the hypothesis that an adjective's opposite would maintain the same meaning

across concepts. The authors used 15 SD scales to describe each of 12 concepts. In addition, they gave each of 135 subjects only one polar adjective for each scale and asked each subject to fill in a blank with an appropiate opposite word. Subjects were requested to make changes in self-selected polar opposites across concepts when it seemed appropriate. The percentage of subjects making a change in endpoint for a scale ranged from four percent (for the adjectives brave and hot) to 41 percent (rugged). Carter et al. (1968) suggested that to use the same polar opposite across concepts may introduce serious error. Although their suggestion might improve slightly the validity of SD scales, it would normally be impractical to do so because of the difficulty of justifying the procedure to a population and because of time constraints for answering most questionnaires.

Osgood et al. (1957) assumed that the factor they labeled "evaluation" was unidimensional. Komorita and Bass (1967) tested the hypothesis that evaluative SD scales could be differentiated into more than one evaluative dimension. Undergraduate students were administered 16 evaluative SD's and asked to evaluate two issues: 1) American foreign policy in Vietnam, and 2) draft deferments for married students. Eleven of the scales were selected from those reported by Osgood et al. (1957) to have high evaluative factor loadings and the remainder were selected

from Roget's Thesaurus on the basis of similarity in meaning with the other 11 scales. The authors performed a factor analysis on the intercorrelations among the 16 scales and obtained three distinct factors on each issue: 1) a functional-utilitarian factor, 2) an affective-emotional factor, and 3) a moral-ethical factor. The authors concluded that SD scales do not always yield a general, evaluative dimension and cautioned users about spurious results and false conclusions that might arise from concept-scale interaction. The authors' results suggest that factor analysis is a useful tool for reducing the possibility of concept-scale interaction.

In summary, the SD procedure measures attitudes in terms of ratings on evaluative bipolar scales with contrasting adjectives at the endpoints. Because of conflicting findings concerning the equality of intensity and extremeness of SD-measured attitudes, the SD procedure should be restricted to measurement of extremity and direction of attitudes. The equidistance of SD scale steps has been supported by adverbial-distance rating tasks. Logical opposites may not retain the same meaning across concepts but it would normally be impractical to obtain population-selected natural opposites. Support has been provided for the multidimensionality of evaluation in terms of SD scales. The SD scaling procedure has been used most frequently when obtaining measurements on independent and

dependent variables of Fishbein's beliefs-based model of attitudes.

Fishbein's Cognitive Structure Model

Fishbein (1965a) has presented a beliefs-based theory of attitude. A skeletal overview of Fishbein's theory is as follows: 1) an individual holds many beliefs about an object, 2) these beliefs are favorable, neutral, or unfavorable toward the object, 3) the beliefs are additive, and 4) the attitude object elicits an evaluative response based on the additive nature of beliefs associated with the object. These parts will be discussed following futher elaboration of the theory.

Fishbein's theoretical model leads to the formulation that an individual's attitude toward any object is a function of (1) the strengths of his beliefs about the object, and (2) the evaluative aspects of those beliefs (i.e., the evaluation of the concept associated with the belief). Fishbein (1967b:394) has algebraically expressed his formulation as follows:

$$A_o = \sum_{i=1}^{N} B_i a_i$$

where A_o = the attitude toward object o

B_i = the strength of belief i about o, that is, the probablity that o is associated with some other concept x_i

a_i = the evaluative aspect of B_i, that is, the evaluation of x_i

N = the number of beliefs about o, that is, the number of responses in the individual's belief hierarchy

Fishbein proposed that beliefs which contribute to an attitude at a given time are those which are salient for the respondent at that time. Salient beliefs are those most likely to be elicited in a free-response situation. As an operational definition of salient beliefs, Fishbein and others (Zajonc 1960) have said they are beliefs elicited by a respondent when asked to list the objects, characteristics, attributes, goals, or values which he associates with an attitude object.

One problem plaguing Fishbein's concept of salient beliefs has been an inability to create an independent measure to test the assumption that saliency is correlated with position in a belief elicitation sequence. Thomas and Tuck (1975) have pointed out that one of the major drawbacks of Fishbein's model is the lack of empirical support for the crucial statement that the beliefs about an object provided early by a subject in a free-response word association trial <u>are</u> the determinants of attitude. There are replicated findings (using the B scale) that expressed beliefs provided early by a respondent are associated with the attitude object with greater strength than subsequent beliefs. This observation does not address the question of

whether beliefs high in the response hierarchy are determinants of attitudes.

Fishbein (1967b) has suggested that although all of an individual's beliefs about an object serve as indicants of his attitude toward the object, it is only the individual's salient beliefs which serve as determinants of attitudes. Salience is a concept of behavior theory meaning dominance in a habit-forming hierarchy of responses.

Procedures for eliciting beliefs have included sentence completion tasks, word association, and adjective checklists. Fishbein and Ajzen (1975) cited a desirable belief-elicitation procedure as one which permits any belief in the hierarchy to be elicited and which does not elicit beliefs that are not part of an individual's belief system.

Fishbein (1967c) suggested there are probably only six to 11 beliefs which actually appear in a person's hierarchy and function as determinants of attitude. Fishbein's statement is supported by studies of attention span and information processing (Mandler 1967, Miller 1956, Woodworth and Scholossberg 1954). Fishbein and Ajzen (1975) later stated that since it is impossible to determine the point at which a person starts eliciting nonsalient beliefs, the use of the first five to nine beliefs provided by a respondent is recommended as a general rule of thumb. Most of Fishbein and Ajzen's

research, and the research of persons investigating Fishbein's model, have employed modal salient beliefs when predicting attitude. Modal salient beliefs are the n beliefs most frequently mentioned by a population under study. Fishbein's use of modal salient beliefs might be questioned because of his original statement that the number of salient beliefs will not be the same for all individuals and even individuals with the same number of salient beliefs may not have the same salient beliefs. That is, Fishbein's original formulation hypothesized that an individual's beliefs would validly predict attitudes but not the modal beliefs of a population.

Fishbein and Raven (1967) have measured the strength of belief on a "B" scale and direction and degree of evaluation on an "A" scale. The B scale actually contains five SD's (impossible-possible, true-false, existent-nonexistent, probable-improbable, unlikely-likely) and the A scale contains five evaluative SD's (harmful-beneficial, wise-foolish, bad-good, dirty-clean, sick-healthy). In a study of the relationship between belief in an object and attitude toward the object, Fishbein and Raven (1967) asked each of 121 subjects to rate the concepts extra-sensory perception, atomic fallout, and racial prejudice on the A and B scales. Correlations between belief in an object and attitudes for the concepts were -0.168, -0.069, and 0.120, respectively. The authors concluded that "it appears

unlikely that belief in the existence of any object should correspond with the attitude toward it" (Fishbein and Raven 1967:185).

Fishbein (1963) earlier obtained a correlation of 0.80 between attitudes toward Negroes (from his A scale) and the sum of the products of belief strength and attribute evaluation (BIAI) on 10 modal descriptive beliefs (sum of products of B and a). The correlation between predicted and measured attitudes was much lower when attitudes were predicted using only the sum of the B's (r=0.02) and the sum of the a's (r=0.47). In an additional investigation, Fishbein (1965b) reported that a group leader's attitude toward the members of his group could be predicted based on a consideration of beliefs about the group. Similarly, a voter's attitude toward a political candidate could be predicted based on evaluations (a's) of the beliefs (Fishbein 1966).

In the first portion of a two-part experiment, Kilty (1971) found that modal salient beliefs were generally better predictors of attitude (13 attitude objects) than were personal beliefs that were elicited, in contrast to Fishbein's hypothesis. Personal beliefs are those beliefs elicited by an individual, usually in a limited period of time. Kilty also reported that six beliefs, whether modal or elicited, did not predict attitude better than three beliefs, a finding which is unsupportive of Fishbein's

hypothesis of belief saliency and its relationship to attitudes. In the second part of the experiment Kilty found that standard (modal) beliefs gave the highest correlations for abstract concepts while personal elicited beliefs were most highly correlated with concrete issues and person concepts.

Assuming a value of unity for belief strength, Bruvold (1974) found an average correlation of 0.73 between attitudes toward science and evaluations of consequences of science (a's). The author inferred from his data that attitude toward science is a function of the number and character of beliefs held about science. He had previously (Bruvold 1972, 1973) reported findings also supportive of Fishbein's model.

Hackman and Anderson (1968) examined the relationship between attitude predictions from Fishbein's formulation and independently measured attitudes under three belief source conditions: 1) beliefs elicited from each subject (unlimited elicitation time), 2) a standard set of beliefs (those most frequently elicited by the total number of subjects), and 3) an arbitrary (irrelevant) set of beliefs. Results from their study did not confirm expectations from Fishbein's model. Elicited (personal) beliefs correlated 0.46 with attitudes, 0.62 with modal beliefs, and 0.55 with arbitrary ("external") beliefs. Hackman and Anderson (1968:66) concluded that their findings were exactly

opposite the implications of Fishbein's theory and "tend to cast considerable doubt on the theoretical contention that beliefs elicited by the subjects themselves are the proper basis for generating predictions of global evaluative judgments."

Kaplan and Fishbein (1969) pointed out that the personal elicited beliefs used by Hackman and Anderson (1969) probably contained a number of nonsalient beliefs because each subject had been allowed unlimited time to provide personal beliefs and was allowed to list up to 10 beliefs. The authors suggested that the modal set of eight most frequently elicited beliefs in the Hackman and Anderson study probably contained fewer nonsalient beliefs than did each personal set of beliefs and could possibly account for the low predictability of "salient" personal beliefs in the Hackman and Anderson study. To test the effect of a restricted elicitation period, Kaplan and Fishbein (1969) requested each of 67 undergraduate students to list as many descriptions of Negroes as he or she could in three minutes. The students also evaluated "Negroes" on Fishbein's A scale and provided a measure of the strength of belief and degree of evaluation of belief concepts for personal and standard (six) beliefs on the A and B scales, respectively. Four predicted attitude scores were computed for each subject: 1) based on six standard beliefs from another population, 2) based on the entire set of beliefs

elicited by the subject, 3) based only on the first six beliefs elicited, and 4) based on the first nine beliefs elicited. The correlation of predicted and measured attitudes was 0.37 for the set of standard beliefs, 0.21 for all elicited beliefs, 0.32 for the first six elicted beliefs, and 0.36 for the first nine elicted beliefs. The authors' results suggest that forced elicitation leading to the use of nonsalient beliefs is the source of error which reduces the predicted superiority of the attitude estimate based on the individual's own beliefs. The generally low correlations provided poor support for Fishbein's contention that an individual's attitude is determined by his personal salient beliefs.

Smith and Clark (1973) used the beliefs-based equation of Fishbein's attitude theory and Fishbein's A and B scales to predict attitudes toward Negroes. The correlation between measured attitudes and attitudes that were predicted from summing the products of belief strength and characteristic evaluation for four modal salient beliefs was 0.62. Smith and Clark also found that attitudes toward Negroes were predicted equally well when the estimate was based on characteristics previously attributed by the subjects to an "Ideal Person" (r=0.62). For these subjects the evaluations of the characteristics were combined with the strength of belief that Negroes possessed the ideal person characteristic. Thomas (1975) suggested that Smith

and Clark's findings raised doubts about Fishbein's theory, since their prediction of attitude using modal salient beliefs was equal in predictability to an estimate based on attributes known to be nonsalient (characteristics of ideal persons).

Smith and Clark (1973) were the first investigators to examine the contributions of each element of Fishbein's formulation (B, a, Ba) in predicting attitudes. Two Negro characteristics mentioned most frequently by the population under study stood out as dominant predictors of attitudes: dark skin and curly, kinky hair. The product of B and a for dark skin and curly, kinky hair correlated 0.69 and 0.56, respectively, with attitudes (the sum of all products of B and a correlated only 0.62). For both characteristics, the a (evaluation) element provided the greatest contribution to predictability (r=0.72 between "a" for dark skin and attitudes and r=0.60 between "a" for curly, kinky hair and attitudes). The B (belief strength) element actually reduced the predictability of resulting products of B and a (r=-0.07 between B for dark skin and attitudes and r=-0.14 between B for curly, kinky hair and attitudes).

Milord and Perry (1976) hypothesized that the correspondence between the elements of Fishbein's equation, A and the sum of products of B and a, would increase as the personal relevance of the attitude object to the subject

increased. Introductory psychology class students made ratings of 10 countries, their university administration, and their psychology class professor. Subjects then evaluated (a) each modal attribute of the attitude object and the probability of association of the attribute and the attitude object (B). In line with their hypothesis, the investigators found a small mean correlation for countries (r=0.28), a larger correlation for administration (r=0.40), and a still larger correlation for professor (r=0.64). Milord and Perry's (1976) findings suggest that the predictability of Fishbein's formulation may vary with the salience (relevance) of the attitude object.

In another investigation of Fishbein's model, Cronen and Conville (1975) were concerned with potential cue-producing effects of SD evaluative adjectives and employed a single 11-point scale (extremely favorable to extremely unfavorable) when measuring attitudes of students toward "politicians." Cue-producing effects refer to the potential for one or more SD's of the A scale to make other beliefs temporarily salient, thus changing attitudes from what they might have been without the cueing effect of the scales. Each of 55 subjects was asked to list as many characteristics, qualities, and attributes of politicians as he or she could in 75 seconds. This period of time was determined from an earlier pretest and was designed to result in only "salient" personal beliefs. Subjects

evaluated each of their elicited attributes on a single-item good-bad SD and supplied B values on a probable-improbable SD scale. The authors reported a correlation of 0.77 between measured attitudes and the sum of belief strength-attribute evaluation products. Cronen and Conville (1975:50) concluded that "Summation theory can function as a powerful predictor of attitude when estimates are based on subject's own elicited beliefs." Although the obtained correlation of 0.77 was greater than the correlation of 0.66 obtained by Anderson and Fishbein (1965) with experimenter-provided beliefs and a fictitious person attitude object, the two correlations were not significantly different (P=0.09).

Support for Fishbein's model was found in a study by Jaccard and Davidson (1972) in which the cognitive basis of attitudes of women toward birth control pills was investigated. Beliefs about the consequences of using the pill were elicited from each of 22 women. The 15 beliefs mentioned most frequently by all women (modal salient beliefs) were used in a questionnaire given to a new sample of 73 women. Using Fishbein's A and B scales, the authors obtained measures of belief strength, evaluation of consequences, and attitudes toward using birth control pills. A correlation of 0.73 was found between predicted and independently-measured attitude scores.

Thomas and Tuck (1975) compared predictions of

attitudes toward Sweden using an individual's own beliefs and modal descriptive beliefs and found no significant difference between the two predictions. Employing yet another strategy to limit personal beliefs to only those that were "salient," the authors requested subjects to list only those characteristics, qualities, and attributes of Sweden which came easily and quickly to mind.

In addition to studies by Smith and Clark (1973) and Milord and Perry (1976), positive support for Fishbein's formulation of attitudes has been provided by Triandis and Fishbein (1963), Fishbein and Hunter (1964), Fishbein and Feldman (1963), and Fishbein and Coombs (1974).

Fishbein's model of the beliefs' basis of attitudes is extremely important for both attitude theory and measurement. Fishbein is certainly not alone in stressing the importance of beliefs. Hollen (1972:15) stated "A person's attitude toward an object consists of a cluster of beliefs about that object" and Shaw and Wright (1967:12) suggest that "The set of beliefs that the individual holds about the object and the associated evaluations determine the individual's attitude toward that object." Fishbein's model constitutes a theoretical foundation for virtually all major attitude measurement procedures (e.g., Likert, Thurstone, Guttman) because of its emphasis on the importance of beliefs in influencing attitudes.

Most major attitude measurement procedures, such as

Likert and Thurstone equal-interval scaling, employ evaluative belief statements of similar or different intensity to measure attitude. Fishbein has attempted to formalize and bring into the open the often unstated theoretical basis underlying major attitude measurement procedures. Because of the importance of the implications of Fishbein's model, it is disappointing to observe the often low correlations between A and the sum of products of B and a reported in investigations of his model. Some of these low correlations may be due to unreliability associated with measurement of A, B, and/or a. None of the published investigations of Fishbein's model have recomputed correlations after correcting for attenuation due to unreliability, presumably because of the difficulty of computing a reliability coefficient for an index (sum of products of B and a) based on the products of many multiple-item scales (i.e., A and B scales). Another reason for low predictability may be the presence of SD's in Fishbein's A scale which are irrelevant when associated with a concept.

Cronen and Conville (1975) have been the only investigators whom have not used the A scale for measuring attitudes. Although the different conditions of administering the instruments preclude exact comparability among the numerous studies, Cronen and Conville, employing a single 11-point scale to measure attitudes, reported a

correlation (r=0.77) between A and the sum of products of B and a which is generally higher than that reported in studies measuring attitudes on the A scale. Two of the five SD's of the A scale (dirty-clean, sick-healthy) would intuitively seem to be irrelevant to some previously measured concepts, such as science and draft deferment for married students. None of the investigations of Fishbein's model have reported item-corrected total correlations for the SD's dirty-clean and sick-healthy, nor have they reported the reliabiliy of the A scale.

Another seemingly plausible explanation for low predictability might be the introduction of confounding variance due to evaluations of attributes (x's) without an explicit frame of reference. For example, a person asked to list the attributes or characteristics of snakes (the attitude object) may provide the word "long." The person would then be asked to rate the phrase "Snakes are long" on a belief strength scale (the B scale) and evaluate the word "long" on the A scale. Because the word "long" is not explicitly associated with snakes when it is evaluated (i.e., good-bad), the individual may be thinking of another attitude object when evaluating the word (such as a car trip). Because the connotative meaning of a word may vary across concepts, it would seem desirable to at least instruct subjects to keep the attitude object in mind when evaluating its attributes.

Value Importance, Perceived Instrumentality, and Attitudes

Early studies by Pinter (1933) and Smith (1949) are typical of investigations of the correlation between personal values and attitudes.

Pinter (1933) was interested in the relationship between attitudes of college students toward church, prohibition, war, and the Negro and personal values as measured on Vernon and Allport's (1931) generalized measuring instrument for personal values. Pinter found correlations of 0.20 to 0.40 between personal values and the four attitudes.

Smith (1949) found a positive association (percentage differences in crosstabulations) between attitudes toward Russia and the relative importance of particular values to respondents. Negative attitudes toward Russia were associated with a personal value for liberty while positive attitudes were related to a value for economic security. Smith also found that respondents' statements concerning how Communism or Russia would affect values such as liberty and freedom, religion, and economic security were related to attitudes toward Russia.

A study by Woodruff and DiVesta (1948) went beyond correlation studies such as Smith's (1949) and attempted to specify the functional relationship between attitudes and values. Woodruff and DiVesta (1948:648) hypothesized that:

> An individual's attitude toward any object, proposition, or circumstance will be favorable, if

> according to his concepts, that object seems to favor the achievement of strong positive values. Conversely, one's attitude toward any object, proposition, or circumstance will be unfavorable if, according to his concepts, the object seems to threaten his strong positive values.

The authors' term "concepts" refers to what was later called "instrumentality beliefs" by Hollen (1972:15). Instrumentality beliefs are beliefs about the degree to which an attitude object will tend to facilitate or block the attainment of values. In contrast to a values-based model, the attributes associated with an attitude object in Fishbein's model may not be valued.

Woodruff and DiVesta also hypothesized that a change in an individual's concept (instrumentality beliefs) would lead to a change in his attitude. They used a test previously developed by Woodruff (1942) to measure the importance of 24 values. Attitudes and concepts associated with abolishment of fraternities and sororities were measured using both closed and open-ended questions. The first hypothesis was supported by a 0.80 correlation between attitude scores and instrumentality belief scores. The authors later supplied their subjects with literature favoring retention of fraternities and sororities and then retested attitudes and instrumentality beliefs. An analysis of retest scores suggested that instrumentality beliefs had changed in a favorable (pro-Greek) direction and had produced more favorable attitudes toward fraternities and sororities. Thus, their study provided

evidence of a correlation between attitudes and instrumentality beliefs and a functional relationship between the two components. The authors concluded that (Woodruff and DiVesta 1948:657):

> One's attitude toward a specific object or condition in a specific situation seems to be a function of the way one conceives that object from the standpoint of its effect on one's most cherished values.

According to Rokeach (1968), there is a functional relation between attitudes and values. Rokeach (1968:162) hypothesized the following relations between attitudes and values:

> The thousands of attitudes within a person's belief system are all in the service of and cognitively connected with perhaps a few dozen instrumental values, and...the instrumental vales are, in their turn, functionally and cognitively connected with an even fewer number of terminal values. This value-attitude system is more or less internally consistent.

Rokeach (1968) suggested that an individual's attitude may be understood as favorable or unfavorable reactions to objects in his environment which he thinks are instrumentally related to his values. In contrast to instrumental beliefs, Fishbein's model stresses the degree of association of attributes (not values) with an attitude object. A values-based model stresses the influence of an attitude object on attainment or blocking of values whereas Fishbein's beliefs-based model stresses the affect associated with consequences, characteristics, or attributes of an attitude object.

Rosenberg (1960a) and others (Chein 1967, French 1947, Heider 1946, Peak 1958) have suggested that the basis of a person's attitude is expectations about how an attitude object facilitates his values. Rosenberg (1967) conducted a study similar to the correlational portion of Woodruff and DiVesta's (1948) study. He hypothesized that (Rosenberg 1967:325):

> The degree and sign of affect aroused in an individual by an object (as reflected by the position he chooses on an attitude scale) vary as a function of the algebraic sum of the products obtained by multiplying the rated importance of each value associated with that object by the rated potency of the object for achieving or blocking the realization of that value.

Although not provided by Rosenberg, his hypothesis in equation form would be:

$$A_o = \sum_{a=1}^{N} V_a Pi_a$$

where A_o = attitude toward an object o

V_a = importance of value a

Pi_a = perceived instrumentality, or the degree to which the attitude object facilitates or blocks the realization of value a

N = number of values relevant to the attitude object

Rosenberg (1967:326) obtained measures of the attitudes of 120 subjects toward "whether members of the Communist Party should be allowed to address the public" on a five-point rating scale (extreme opposition to extreme approval).

Three to five weeks after administration of the attitude scale, Rosenberg used two card-sorting procedures to measure value importance and perceived instrumentality. In the first card-sorting procedure, subjects were asked to rate each of 35 value items in terms of (1) the importance of the value as a source of satisfaction (V, sorted into 21 categories), and (2) the extent to which the value would be attained or blocked by allowing Communists to address the American public (Pi, sorted into 11 categories). After completing the first sorting procedure, subjects rank-ordered the value items in terms of value importance and perceived instrumentality (two separate ranking procedures). Subjects were also requested to rank-order "salient" values which had been previously collected from a verbal defense (discussions and probes by an interviewer) of their stated attitude position. Rosenberg developed four indices to test his hypothesis of a relationship between the values-based model and attitude position. A chi-square test of independence revealed the existence of a significant relationship ($P<0.02$) between each of the four indicies and attitude position. Thus, Rosenberg's hypothesis was supported. Rosenberg also found that attitudinal position varied significantly with value importance and perceived instrumentality scores when each was considered while the other was held constant. Rosenberg (1967) interpreted this finding as indicating

that value importance and perceived instrumentality are separate and possibly manipulable dimensions of attitude-related cognitive structure.

In addition to his correlational study of attitudes, values, and perceptions of instrumentality, Rosenberg (1960a, 1960b) has conducted studies to test the hypothesis that hypnotically induced attitude change could produce changes in beliefs about the perceived instrumentality of the attitude object. In several studies, Rosenberg (1960a, 1960b) used posthypnotic suggestion to induce a reversal of attitudes and found this led to four different types of change in perceived instrumentality. He also found changes in the importance of values resulting from induced attitude modification. Rosenberg (1960b:63) concluded that "Subjects tend to rely on instrumentality change significantly more than value change in reorganizing their cognitive structures to accomodate reversals of attitude affect."

Insko et al. (1970) employed Rosenberg's (1967) formulation to predict attitudes of low-income females toward using birth control methods. The authors reported a correlation of 0.42 between (1) the summed products of 47 ratings of value importance and perceived instrumentality and (2) attitudes toward using birth control methods.

Students of Rosenberg's model have attempted to modify attitudes experimentally by manipulating perceived

instrumentality (Carlson 1956, Cook and Insko 1968, DiVesta and Merwin 1960, Homant 1971) or by modifying perceptions of the importance of one or more attitudinally-relevant values (Hollen 1972, Penner 1971, Rokeach 1971).

Manipulating Perceived Instrumentality

A study by DiVesta and Merwin (1960) concluded that attitudes toward teaching as a career were enhanced by modifying perceptions of the instrumentality of teaching for attaining a value of personal achievement in teachers through classroom instruction. Achievement referred to the realization of personal values and goals associated with teaching as a career. Instrumentality referred to the effect of teaching on attaining or blocking personal achievement from classroom instruction. A panel discussion which emphasized the value of personal achievement attained through teaching produced more favorable attitudes among the panel audience than among members of a control group (posttest score minus pretest score).

A study by Carlson (1956) tested the hypothesis that attitudes can be changed by altering an individual's perception of the instrumentality of the attitude object in attaining valued goals. Measures of value importance and perceived instrumentality were similar to those employed by Rosenberg (1953). Attitudes were measured toward "allowing Negroes to move into White neighborhoods" (Carlson 1956:261). Experimental subjects received persuasive

messages designed to increase their awareness that nonsegregation would lead to the attainment of each of four important values. Following the persuasive messages, subjects were found to have changed their beliefs significantly ($P<0.01$) regarding the instrumentality of nonsegregation for each of the four values and their attitude toward allowing Negroes to move into White neighborhoods. The expressed importance of values was not affected by the persuasive messages.

A study by Cook and Insko (1968) provides further support for Rosenberg's model. The authors found more attitude change when an issue (Congressional election of U. S. President) was reported to be instrumental in the attainment of six values than when it was reported to be instrumental in the attainment of only two values. The authors also reported that the communication which presented six positive instrumental relations resulted in a greater persistence of attitude change than did the two-value communication.

Homant (1971) provides additional evidence that an attitude may be changed by modifying its instrumental relation to an important value. Attitudes of college students toward a sliding scale tuition plan were measured and an experimental group was given a persuasive message arguing that the tuition plan would be instrumental to the attainment of an important value, freedom. Attitudes

toward the hypothetical tuition plan were more favorable following the persuasive message (mean difference of 0.61 on a 5-point scale, significantly different at $P<0.01$). Homant (1971) did not measure perceived instrumentality but interpreted the change in attitudes in terms of percieved instrumentality.

Manipulating Value Importance

Hollen (1972) employed a persuasive message designed to increase perceptions of the importance of a value. Hollen's results suggested that not only can value importance be modified, but that increasing perceptions of the importance of a value will produce an increase in positive attitudes toward related issues. Hollen found that an induced increase in the importance of a value led to increases in favorable attitudes toward objects which were perceived as facilitating the attainment of that value. Hollen did not suggest that direct instrumentality relationships are the sole determinants of attitude intensity. Attitudes may also be developed through experience with the attitude object or through suggestions of authority figures. Hollen (1972:17) did suggest that "values...are viewed as fundamental determinants of attitudes and behaviors."

Both Penner (1971) and Rokeach (1971) have provided additional evidence regarding value change and subsequent attitude change. Penner (1971) and Rokeach (1971) reported

that experimentally-induced increases in the importance of a personal value led to subsequent changes in value-related attitudes and behaviors.

Fishbein's and Rosenberg's Models Compared

Fishbein's model was developed within the framework of behavior theory whereas Rosenberg's model was influenced by the functional approach to attitudes (Fishbein and Ajzen 1975). The functional approach to the study of attitudes was initiated by Katz (1960) and interprets attitudes and attitude change in terms of the functions they serve for the individual. Attitudes are reported to perform instrumental, ego-defensive, value-expressive, and knowledge functions (Katz 1960). Fishbein and Ajzen (1975) have noted that Fishbein's model accounts for the relation between beliefs and attitude in terms of conditioning processes, whereas Rosenberg's model invokes affective-cognitive consistency and expectancy-value theory to account for the same relations. Although the two models are derived from different schools of thought about cognitive structure, Fishbein (1967b) has stated that both models have considerable structural similarities and the basic hypothesis about each can be described by the same algebraic expression.

Fishbein (1967a:259) has suggested that when investigators are referring to an individual's cognitive structure or the cognitive basis of attitudes, they are

referring to one or more of the following belief types:

1. Beliefs about the component parts of the object.
2. Beliefs about the characteristics, qualities, or attributes of the object.
3. Beliefs about the object's relation with other objects or concepts.
4. Beliefs about whether the object will lead to or block the attainment of values.

Fishbein's work and the research of other individuals adopting his model have concentrated almost exclusively on beliefs about the component parts, characteristics or attributes of the attitude object. Conversely, Rosenberg's values-based model has concentrated on beliefs of type four, or instrumentality beliefs. Attributes may or may not be valued by an individual and are generally descriptive characteristics of an attitude object. Attributes in Fishbein's model have generally been denotative rather than connotative. In Fishbein's model it is not reasonable to discuss the effect of the attitude object on the attributes because the attributes are characteristics of the attitude object. In contrast, Rosenberg's model concerns the effect of the attitude object on the attainment and blockage of values. Values are always positive whereas attributes (in Fishbein's model) may be negatively or positively evaluated.

Fishbein's and Rosenberg's models of the cognitive structure of attitude can perhaps be differentiated on a connotative-denotative continuum. The difference has to do

with the nature of the cognitions being considered.

Rosenberg (1965:122) compared the two types of cognition:

> The objects to which attitude objects are linked in relevant cognitions tend to be of different classes depending upon the type to which the attitude object itself belongs. Thus, attitudinal cognitions about liked or disliked persons and groups are usually concerned with positive or negative attributes and "defining characteristics" [denotative dimension]. On the other hand, cognitions about the actions of a person about favored or disfavored social actions, proposed policy changes, legislative developments, and so on, are usually concerned with positive or negative goals or with general values whose attainment is seen as fostered or hampered through the agency of the attitude object [connotative dimension].

Fishbein's focus is on the former type of cognition-attitude relationships while Rosenberg's focus is on the latter type.

Both Fishbein's and Rosenberg's models view attitude organization and change as a process of cognitive summation, in contrast to consistency theories which view attitude organization and change as a process of cognitive balance. Cognitive balance theories (Osgood and Tannenbaum 1955, Heider 1958) would predict that if an individual held two beliefs about an object, one belief having a low evaluative aspect and another having a high positive evaluative aspect, the individual's attitude would represent a mean of the evaluative aspects of the two beliefs. In contrast, Fishbein's model states that an attitude is a function of the summation of BIAI products and Rosenberg's model states that an attitude is a function

of the summation of product of value importance and perceived instrumentality. Cognitive summation and cognitive balance theories have different implications for attitude organization and change. As an example, in summation theory each new piece of positive information about an object that a person learns should increase his attitude toward that object. However, from the point of view of balance theory, learning a piece of slightly positive information about an object may serve to reduce the attitude of a person having a very positive attitude.

Normative Influences on Attitudes

It has been demonstrated previously that parents (Trager and Yarrow 1952), schools (Tolley 1973), peer groups (Coleman 1961), and reference groups (Siegel and Siegel 1957) can and do have profound influences upon the formation of specific attitudes in individuals. Fishbein did not include a normative "term" in his attitude prediction equation but has proposed a theory of behavioral intention which includes a normative factor (Fishbein 1967c). Symbolically, Fishbein's behavioral intention theory can be expressed as follows (Fishbein and Ajzen 1975:301):

$$BI = (A_B)w_1 + (SN)w_2$$

where BI = intention to perform behavior B

A_B = person's attitude toward performing behavior B

SN = subjective behavioral norm

w_1, w_2 = regression coefficients

Fishbein (1967c) and others (Ajzen and Fishbein 1969, 1972, 1973, DeVries and Ajzen 1971) have obtained relatively high (above 0.80) multiple correlations between specific behavioral intentions and the two components of Fishbein's intention model. The second, or normative, component would appear relevant to an investigation of attitudes. Fishbein and Ajzen (1975:302) define subjective norm as "the person's perception that most people who are important to him think he should or should not perform the behavior in question." According to Fishbein's behavioral intention theory, the general subjective norm (SN) is determined by perceived behavioral expectations of specific reference individuals or groups and by the person's willingness to comply with these expectations. These specific individuals and groups will hereinafter be called relevant referents. Fishbein and Ajzen (1975:302) have presented a symbolic representation of the subjective norm as follows:

$$SN = \sum_{i=1}^{n} b_i m_i$$

where SN = subjective behavioral norm

b_i = normative belief (i.e., the person's belief that reference group or individual i thinks he should or should not perform behavior b)

m_i = willingness to comply with referent i

n = total number of relevant referents

The product of b and m is computed for each reference individual or group, the products summed across all relevant referents, and the sum viewed as equivalent to a "generalized normative belief" (i.e., the subjective norm or SN).

Examples of procedures for measuring b and m are provided by DeVries and Ajzen (1971) and Jaccard and Davidson (1972) who used the following items to measure a person's perceptions about the normative beliefs of relevant referents:

My immediate family expects me to cheat in college

probable ____:____:____:____:____:____:____ improbable

My mother thinks

I should ____:____:____:____:____:____:____ should not use birth control pills

Examples of willingness to comply (m) with expectations of relevant referents are (Devries and Ajzen 1971, Jaccard and Davidson 1972):

How much do you want to do what your immediate family expects you to do?

Want very much to ___:___:___:___:___:___:___ Want very much not to

Don't care

In general

I want to ___:___:___:___:___:___:___ I want not to do what my mother thinks I should do

A difficulty with employing the SN component in a study of attitudes is in determining the "relevant" referents (Ajzen and Fishbein 1973). Fishbein and Ajzen (1975:302) simply state that "the potential reference groups or individuals whose expectations are perceived to be relevant will vary with the behavioral situation." The number of "relevant" groups and individuals has ranged from five (McArdle 1972) to 12 (Jaccard and Davidson 1972) in previous studies.

Several studies have been somewhat successful in predicting attitudes toward an object from the SN equation. Ajzen (1971), Ajzen and Fishbein (1970), and Darroch (1970) found attitude-SN correlations of 0.241, 0.262, 0.635, and 0.334.

This literature review has focused primarily on the application of three social psychological models to attitudes. The three models reviewed were Fishbein's beliefs-based model, Rosenberg's values-based model, and Fishbein's subjective behavioral norm concept. Attitudes are reported to be directly influenced by beliefs about the component parts of the attitude object (Fishbein's beliefs-based model) and by the effect of the attitude object on attainment of values (Rosenberg's values-based model). Attitudes are also reported to be influenced indirectly by reference individuals and groups (subjective norm). Because the three models have been studied in isolation, it

has not been possible to determine potential additive and interactive relationships among them. The research reported herein is directed at illuminating potential additive and interactive relationships among the models and examining the application of the models to attitudes toward game laws and regulations.

PROCEDURES AND TECHNIQUES

To better understand the cognitive basis of attitudes toward game laws and regulations, several cognitive models of attitudes in social psychology were investigated. These cognitive models include Fishbein's (1963) beliefs-based model and Rosenberg's (1967) values-based model. As part of an overall strategy to identify those factors influencing attitude favorability, a modification of Fishbein's (Fishbein and Ajzen 1975) subjective behavioral norm concept was also employed to predict attitudes of Virginia hunters toward game laws and regulations.

Attitudes toward game laws and regulations were investigated instead of attitudes toward wildlife laws and regulations. It was thought that hunters would not be familiar with many wildlife laws (e.g., Bald Eagle Protection Act, Marine Mammals Protection Act).

Initially, this research proposed to compare the ability of three social psychological models to predict the attitudes of Virginia hunters toward game laws and regulations, game law enforcement, Virginia game wardens, game law violations, and sportsmanship in hunting. However, because of time and data-collection method constraints, the investigation of attitudes toward the latter four attitude objects was limited to measurement and association analysis.

Study Population

The study population consisted of all individuals buying Virginia resident state hunting licenses between 1 July 1977 and 30 June 1978. The population included all individuals acquiring Virginia resident black bear (*Ursus americanus*), white-tailed deer (*Odocoileus virginianus*), and wild turkey (*Meleagris gallopavo*) hunting licenses because a resident state hunting license is required to purchase the resident state big game hunting license.

Data-Gathering Instrument

A self-administered mail questionnaire was employed as the data-gathering instrument. The comparative effectiveness of telephone or personal interviews with a mail questionnaire was not considered due to time, cost, and manpower constraints.

Development of Instruments

Because it was necessary to acquire certain information from the population prior to development of a final questionnaire, and because of the desirability of pretesting questions for clarity and understandability, four different pretests were developed.

Each of the four pretests contained two sections. Section A of Pretests 1-3 was identical (Appendix A). Section B of Pretests 1-3 is presented in Appendices B-D,

respectively. The contents of Pretest 4 and the final survey are presented in Appendices E and F, respectively.

Reason Analysis

The intent of section B of Pretest 4 (Appendix E) was to produce a list of reasons generated by the pretest population for holding unfavorable attitudes toward game laws and regulations in general, sportsmanship in hunting, game law enforcement, Virginia game wardens, and game law violations. These reasons were then to have been included in the final questionnaire in fixed-response questions. However, unfavorable attitudes toward the five attitude objects were not sufficiently prevalent among respondents to Pretest 4 to generate meaningful lists of reasons. Analysis of reasons for holding attitudes was subsequently dropped from the research.

Fishbein's Beliefs-Based Model of Attitudes

As discussed previously, investigators have employed both an individual's own beliefs and modal descriptive beliefs when predicting attitudes. Consideration was given to the possibility of eliciting personal beliefs from each respondent concerning game laws and regulations and having respondents provide belief strength and attribute evaluation judgements for each elicited belief. A decision was made not to obtain personal beliefs in the final survey

because, as previous investigators have noted (Thomas and Tuck 1975), it is extremely difficult to administer a belief-elicitation and judgement procedure in a mail questionnaire. This decision detracted from the intent of Fishbein's original beliefs-based formulation of attitudes, but it was the only practical alternative. It was therefore decided to generate a set of modal descriptive beliefs from the Pretest 3 sample.

Section B of Pretest 3 (Appendix D) requested sample members to provide a brief list of what they thought were the characteristics, qualities, or consequences of game laws and regulations. A sample set of hypothetical responses to the stimulus "interstate highways" was provided to aid respondents in accomplishing this task. Respondents were cautioned to include only those words or phrases coming quickly and easily to mind. This was done to reduce the number of nonsalient beliefs they might generate.

Characteristics obtained in the pretesting were grouped according to similarity. Eight of the 11 characteristics cited five or more times by Pretest 3 respondents were included in the final questionnaire and are believed to constitute modal descriptive beliefs. Three of the characteristics were not included because they were thought to be too general to provide a meaningful

denotation. In addition, to compare the predictive ability of the eight modal descriptive beliefs with nonmodal beliefs, six characteristics intuitively thought to be important to attitudes toward game laws and regulations were developed. Three of the six developed characteristics were favorable to the attitude object and three were unfavorable. The six characteristics were mixed randomly with the eight modal descriptive beliefs. The six developed characteristics are represented by questions 3, 5, 7, 8, 10, and 14 in Parts I and II of section F of the final questionnaire (Appendix F).

Part I of section F of the final questionnaire requested subjects to indicate the degree to which they thought each of the 14 belief statements was true or false on a seven-point SD scale. Each belief began with the prefix "game laws and regulations" and ended with a suffix corresponding to a previously selected or developed characteristic of game laws and regulations. Part I was designed to collect information for use in the belief strength judgement portion of Fishbein's model.

Part II of section F requested subjects to indicate the degree to which they thought each of the 14 characteristics (attributes) was good or bad on a seven-point SD scale. Part II obtained information for use in the attribute evaluation portion of Fishbein's model.

Rosenberg's Model

Two procedures were employed to produce a set of hunting satisfaction items for inclusion in the final survey.

First, the 73 hunting satisfaction items developed by Potter et al. (1973) were reduced to 52 items by deleting those items which intuitively would not seem to be affected in any manner by game laws and regulations (e.g., maintaining hunting equipment). Only somewhat marginal causes between game laws and regulations and hunting satisfactions could be hypothesized for a portion of the remaining 52 items, but it was decided to retain all 52 items for inclusion in the pretest stage. Section A of Pretest 4 requested subjects to indicate whether attainment of satisfaction from each of 52 hunting activities was helped, hindered, or not affected by game laws and regulations. A pretest hunting satisfaction item was included in the final questionnaire if less then 50 percent of pretest item respondents reported that satisfaction from the activity was not affected by game laws and regulations.

The second procedure, section B of Pretest 1 (Appendix B), requested subjects to list up to five hunting pleasures which game laws and regulations added to or reduced for them. After aggregating hunter responses into similar categories, 15 satisfaction items were found to have been

cited three or more times by respondents. From the 15 items, those which were related to an activity and which were not identical or very similar to items selected from section A of Pretest 4 were selected for inclusion in the final questionnaire.

Section D of the final survey requested subjects to indicate the degree to which each of 36 hunting activities added to or detracted from hunting satisfaction. Each item was rated on a nine-point category rating scale and constitutes a measure of value importance (V) in Rosenberg's model.

Section E of the final survey requested subjects to evaluate the degree to which attainment of satisfaction from each of 36 hunting activities was helped or hindered by game laws and regulations. Each item was rated on a nine-point category rating scale and constitutes a measure of perceived instrumentality (Pi) in Rosenberg's model.

Fishbein's Subjective Norm Concept

When investigating the applicability of Fishbein's subjective norm concept to attitudes toward game laws and regulations, normative behavior was replaced with normative attitude as a variable in Fishbein's model. That is, an assessment was made of referents' attitudes toward game laws and regulations rather than their behavioral expectations. This was done because the dependent variable

of this study was attitudinal rather than behavioral.

Relevant referents for the study population were identified by asking respondents to Pretests 1-3 who they thought had the strongest effect on how they felt about game laws and regulations (question 26, Pretests 1-3, Appendix A). Subjects were asked to select one referent from among 20 listed potential referents or to write the relationship of an unlisted referent on the line indicated.

Those referents mentioned nine or more times were included in the final questionnaire. Section G of the final questionnaire requested each subject to indicate on a seven-point scale his or her perception of the attitude of each of seven referents and his or her willingness to comply with perceived expectations of each of seven referents.

In addition, to provide a measure of a generalized subjective attitude norm toward game laws and regulations, subjects were asked to indicate on a seven-point scale their perception of the attitudes of people who were important to them toward game laws and regulations. Subjects were requested to report their willingness to comply with expectations of people who were important to them.

Attitude Measurement

Attitudes of Virginia hunters toward game laws and

regulations in general, sportsmanship in hunting, game law violations, game law enforcement, and Virginia game wardens were measured by two procedures.

The first procedure, semantic differential scaling, involved having respondents to section B of Pretest 2 rate each of five attitude objects on between 11 to 15 evaluative, SD, seven-point scales. Standard instructions were provided respondents for completing SD scales. The adjectives were selected from those identified by Osgood et al. (1957) as being associated with an evaluative dimension and from thesaurus listings for Osgood's evaluative adjectives. In some cases, adjectives not presented by Osgood nor discovered through thesaurus comparisons were developed which appeared to have a relevant evaluative connotation for the particular attitude object. When the number of initial evaluative SD's to be associated with an object was even, an even number of favorable and unfavorable adjectives were assigned randomly to location on the page below the stimulus phrase. This was done to achieve mixed polarity to avoid patterned answering. The number of positive versus negative adjectives on the left side of the scaling sheet versus the right side differed by only one when the number of adjectives was odd.

Program RELIABILITY of the Statistical Package for the Social Sciences (SPSS, Nie et al. 1975) was used to compute

Cronbach's alpha, an internal consistency measure of reliability, for each of the original n-item scales. Internal consistency refers to the degree to which the items intercorrelate or the degree to which the items measure the same attitude. Each n-item scale was sequentially reduced to a 5-item scale by deleting the item which would result in the highest alpha if deleted, recomputing corrected item-total correlations for the n-1 items, deleting another item, and repeating the cycle. Program RELIABILTIY was employed to perform the procedure to maximize reliability while reducing the number of items.

Section B of the final questionnaire included standard instructions for completing SD scales and contained a different five-item scale for evaluating each attitude object. Polarities of adjectives were alternated as described for SD scales of Pretest 2.

The second attitude measurement procedure asked each hunter to rate his or her overall feelings about each of five attitude objects on a seven-point scale ranging from "strongly in favor" to "strongly against" (section C, Appendix F).

These two procedures served as two independent measures of attitudes.

Background Questions

Section A of the final questionnaire contained 25

questions related to a respondent's early experiences with hunting, hunting frequency, types of game hunted, number of times inspected by Virginia game wardens, and quality of contact with game wardens. Section H of the final questionnaire asked standard socioeconomic questions (e.g., age, sex, education) as well as two questions about prior or present membership in Boy Scouts of America and 4-H Clubs of America.

Hunter License Sampling

Hunter license sampling for the pretests' samples and the final questionnaire sample was accomplished with two different procedures.

Virginia state resident hunting licenses are combined with other licenses sold and returned to the Virginia Commission of Game and Inland Fisheries, Richmond, by license concessionnaires following the end of a fiscal year. Each license agent returns hunter license receipts in one or more boxes and the boxes are arranged according to the first letter of the last name of the license agent. Twenty-two separate divisons of boxes were available. Each division was considered a stratum and each box within a division was considered a cluster. One cluster was selected randomly from each of the 22 strata and the total number of resident hunting licenses sold in all 22 clusters was enumerated. The total number of licenses (19,906) was

divided by the number of elements desired for the pretests (1,000) and a sampling fraction of 1-in-20 was used to systematically sample hunter license receipts. Stratified cluster sampling with systematic selection of elements within a cluster within a stratum was employed. When the name or mailing address of a hunter could not be read clearly, the next license (up or down sequentially according to the license number) was located. If this license was not legible, further searching was made until a legible name and mailing address was obtained. Up and down movement was alternated. According to the Administrative Officer of the Virginia Commission of Game and Inland Fisheries, approximately 40 percent of the 361,080 licenses sold between 1 July 1977 and 30 June 1978 did not contain information sufficient to allow mailing labels to be prepared.

Elements for inclusion in the final survey sample were selected by using a 1-in-110 systematic sampling of hunter licenses. The total number of elements in the final sample was 3,112.

Administration of Pretests

The 1,000 elements selected for the four pretests were systematically sorted into four piles of 250 elements each for the four pretests. Each of the four pretests was mailed to 250 Virginia hunters on 1 November 1978. Each

mailing packet contained an outside manila mailing envelope, inside business reply envelope, cover leter, and a photo-reduced pretest in 15.81 cm x 22.23 cm booklet format. Pretests 2 and 3 were accompanied by the same cover letter and Pretests 1 and 4 were accompanied by a different cover letter.

Pretests were mailed at the bulk mailing rate and were returned via first class mail. Respondents were promised anonymity of response. A follow-up postcard reminder was mailed to all pretest sample members on 10 November 1978. Nonrespondents were encouraged to return their pretest questionnaire.

Final Survey Administration

The final questionnaire, 17 pages in length, was photo-reduced, printed in 15.81 cm x 22.23 cm booklet format, and mailed to 3,112 Virginia hunters at the bulk mailing rate on 22 January 1979. The initial questionnaire mailing consisted of an outside manila mailing envelope, inside business reply envelope, cover letter, and a questionnaire. Business reply envelopes were returned via first-class mail. Each questionnaire was coded with a unique number between 0001 and 3,112 to identify its return. Subjects were informed of the code and promised confidentiality of response.

A follow-up reminder postcard was mailed to

nonresponding individuals on 1 February 1979. The second follow-up mailing, sent on 12 February, was identical to the initial questionnaire mailing with the exception of a modified cover letter. The third and final follow-up mailing was sent to nonrespondents on 21 February. It consisted of a one-page letter encouraging sample members to return their questionnaire.

Inference About Nonresponse Bias

Telephone interviews with a random sample of nonrespondents to the final questionnaire began on 1 March 1979 and continued until 50 nonrespondents had been interviewed. Because the length of the questionnaire and the nature of several sections prohibited asking all questions contained in the questionnaire, telephone-interviewed persons were asked 10 selected questions. Questions were selected on the basis of interest to the respondent (i.e., related to hunting), ease of answering, and level of measurement obtained. A chi-square test of independence was used to test the null hypothesis of no relationship between being a respondent or a telephone-interviewed nonrespondent and pattern of response on each of questions 2, 4, 5, 7, and 13 of questionnaire section A and questions 10 and 11 of section H. A two-tailed student's t-test was used to test the null hypothesis of no difference in mean response between the two groups on each

of questions 1 and 14 (age when the person began hunting, number of memberships in conservation organizations) of section A and question 2 (age) of section H. A majority of nondependencies between the variable respondent-telephone-interviewed nonrespondent and each of the seven nominal or ordinal questions, and no significant difference in mean response on the age and organizational membership questions, would result in the inference being made that nonresponse bias was absent or of negligible importance. If a majority of dependencies did occur and if a significant difference did occur between mean responses on the age and/or education questions, the inference would be made that nonresponse bias did occur. However, because information on only selected questions was collected from telephone-interviewed nonrespondents, it would not be possible to adjust for the presence of nonresponse bias.

Definition of Variables and Hypothesis Testing

Definition of Variables

Major variables of this analysis were assigned names to facilitate presentation of results.

Attitudes toward game laws and regulations as measured by semantic differential scaling were assigned the variable name LAWSD. A value for this variable was computed by scoring responses from one (the extreme unfavorable pole) to seven (the extreme favorable pole) on each of five SD

scales associated with the stimulus "game laws and regulations in general" and summing values across scales. A value for this variable was computed only for persons answering all five SD scales appropriately. Values for LAWSD could range from 5 to 35. Attitudes toward sportsmanship in hunting, game law violations, game law enforcement, and Virginia game wardens measured by semantic differential scaling were assigned the variable names SPORTSD, VIOLATESD, ENFORCESD, and WARDENSD, respectively. Attitude scores for these variables were calculated the same as for LAWSD.

The sum of 36 products of value importance and perceived instrumentality from sections D and E of the final questionnaire was called SUMVIPI. Responses on sections D and E were rescored from one (extremely detracts, extremely hinders) to nine (extremely adds, extremely helps). An inconsistent response would occur if a person who received no satisfaction or who received dissatisfaction from an activity of section D reported that game laws affected his or her satisfaction in section E. Inconsistent responses in section E were recoded to a neutral value of five. A value for this variable was not computed for those persons answering any of the questions of sections D and E inappropriately (i.e., no response or a multiple response). Values for SUMVIPI could range from

180 to 2,916.

The sum of BIAI products for the eight modal descriptive characteristics (questions 1, 2, 4, 6, 9, 11-13) of section F of the final questionnaire was named MODPROD. Responses to questions of section F were scored from seven (scale step nearest "true" and "good") to one (scale step nearest "false" and "bad"). MODPROD could assume values ranging from 7 to 392. The sum of BIAI products for the six developed characteristics (numbers 3, 5, 7, 8, 10, 14) and for all 14 characteristics were assigned the variable names DEVPROD and SUMBIAI, respectively. DEVPROD could range from 6 to 294 and SUMBIAI from 14 to 686.

The variable representing the perceived subjective attitude norm toward game laws and regulations was named REFERENTS. Responses to questions of section G of the final questionnaire were scored from seven (strongly in favor, extremely necessary, strongly want to) to one (strongly against, extremely unnecessary, strongly do not want to). The value assigned the perceived attitude of a referent was multiplied by the value assigned willingness to comply with the expectations of a referent, products were summed across applicable referents, and the resulting sum divided by the number of applicable referents. It was necessary to divide the sum of products by the number of

referents because in some cases a referent may not have been applicable (e.g., a person may never have known his or her father). REFERENTS could range in magnitude from 1 to 49.

The variable representing the perceived generalized subjective attitude norm toward game laws and regulations was named PEOPPROD. PEOPPROD was computed by multiplying the value associated with response to the statement "Most of the people who are important to me think game laws and regulations are..." by the value associated with response to the question "How much do you want to do what people who are important to you expect you to do?" PEOPPROD could range in magnitude from 1 to 49.

In summary, major variables of this investigation were LAWSD, SPORTSD, VIOLATESD, ENFORCESD, WARDENSD, SUMVIPI, MODPROD, DEVPROD, SUMBIAI, REFERENTS, and PEOPPROD.

Hypothesis Testing

The major hypothesis to be tested was that SUMVIPI, MODPROD, and REFERENTS were related in an additive manner to LAWSD. That is, LAWSD = f(SUMVIPI, MODPROD, REFERENTS). This model also implies that LAWSD is correlated with each of SUMVIPI, MODPROD, and REFERENTS. Pearson correlation analysis with a one-tailed test of significance was used to test the hypothesis of a correlation between LAWSD and each of SUMVIPI, MODPROD, and REFERENTS. A forward selection,

multiple regression technique was used to test the hypothesis that SUMVIPI, MOODPROD, and REFERENTS were related in an additive manner to LAWSD. Three two-way interaction terms (SUMVIPI*MODPROD, SUMVIPI*REFERENTS, MODPROD*REFERENTS) and a three-way interaction term (SUMVIPI*MODPROD*REFERENTS) were included in the model to test for the presence of unhypothesized interaction.

Additional regression models tested were:

1. $\hat{LAWSD} = \beta_1 \text{ SUMVIPI} + \beta_2 \text{ MODPROD} + \beta_3 \text{ DEVPROD}$

2. $\hat{LAWSD} = \beta_1 \text{ SUMVIPI} + \beta_2 \text{ REFERENTS} + \beta_3 \text{ PEOPPROD}$

3. $\hat{LAWSD} = \beta_1 \text{ SUMVIPI} + \beta_2 \text{ SUMBIAI} + \beta_3 \text{ REFERENTS}$

4. $\hat{LAWSD} = \beta_1 \text{ SUMVIPI} + \beta_2 \text{ SUMBIAI} + \beta_3 \text{ PEOPPROD}$

All possible interaction terms were included in the above models. All regression analyses were performed using program STEPWISE of the Statistical Analysis System (SAS, Barr et al. 1976). All other types of statistical operations were performed using SPSS. A correlation coefficient between two variables of less than ± 0.40 was classified as "weak" or "slight," a coefficient between ± 0.41 and ± 0.70 was classified as "moderate," and a coefficient between ± 0.71 and ± 1.00 was classified as

"high" or "strong." Unless stated otherwise, all statistical tests are considered significant at a Type I error of 0.05.

RESULTS

Analysis of Pretests

Response Rates

The number of responses to Pretests 1, 2, 3, and 4 was 80, 83, 79, and 75, respectively. Response rates ranged from a low of 30.0 percent for Pretest 4 to a high of 33.2 percent for Pretest 2. An effective response rate (percent of deliverable questionnaires returned) could not be calculated for pretests or the final survey because mailings were at the nonreturnable bulk mailing rate.

Characteristics of Game Laws and Regulations

A total of 188 characteristics was listed by the 51 persons completing section B of Pretest 3. A mean of 3.7 characteristics was listed by each respondent. Characteristics were classified according to similarity, resulting in 26 characteristics (Table 1). Characteristics cited only once are not presented in Table 1. The number of times a characteristic favorable, unfavorable, and neutral (or unable to determine) toward game laws and regulations was provided was computed. Approximately 60 percent of the characteristics were favorable, 23 percent were unfavorable, and 16 percent were neutral or of undeterminable favorability.

Eight of the 11 characteristics mentioned five or more times by pretest respondents were included in attribute

Table 1. Characteristics, qualities, and consequences of game laws and regulations provided by respondents to section B of pretest 3.

Characteristic	Number of Times Mentioned
Necessary	13
Good to protect game	12
Fair	11
Good	11
Safer hunting	10
Preservation of wildlife	10
Not enforced strongly enough	9
Too restrictive	8
Not responsive to changes in game populations	6
Good game management	5
Conservation	5
More game	4
Good laws	4
Laws not harsh enough for certain violations	4
Should obey laws	4
Efficient	3
Enforced regulations	3
Ensure future game populations	3

Table 1. Characteristics, qualities, and consequences of game laws and regulations provided by respondents to section B of pretest 3 (continued).

Characteristic	Number of Times Mentioned
Protect property owners	3
Tough on offenders	2
Good planning of times for hunting	2
Well known	2
Provides for better hunting	2
Intelligently thought-out	2
Determined on a factual basis	2
Well-enforced	2
Other	44

evaluation and belief strength rating tasks in the final questionnaire. The characteristics "necessary" (n=13), "fair" (n=11), and "good" (n=11) were not included in the final questionnaire because they were thought to be too general and inclusive of several characteristics to be listed. Two of the six developed characteristics (difficult to interpret, intelligently thought-out) were mentioned once by pretest respondents and one developed characterstic (more game) was cited four times by pretest respondents.

There may have been some confusion on the part of respondents concerning the intent of this belief elicitation procedure. This is indicated by the observation that three of every 10 persons completing section A did not complete section B and by the obervation that the mean number of characteristics elicited per respondent to section B (3.7) was much lower than expected based on Fishbein's statement of six to 11 beliefs in a person's hierarchy of responses. Game laws and regulations may also have been less salient than other attitude objects. Beattie (1979), in a study of beliefs associated with game laws and regulations by 20 fisheries and wildlife graduate students, reported a mean of 8.65 beliefs elicited per respondent. The higher number of beliefs elicited by graduate students than by hunters may have been due to

greater saliency of game laws for graduate students in fisheries and wildlife.

Hunting Satisfactions Affected by Game Laws and Regulations

A hunting satisfaction item from section A of Pretest 4 was included in the final questionnaire if less than 50 percent of respondents reported that satisfaction from the activity was not affected by game laws and regulations. On the basis of this criterion, 30 of the 52 pretest items were included in the final questionnaire.

A total of 134 hunting activities was listed by the 60 people completing section B of Pretest 1. A mean of 2.23 activities was listed by each respondent. Activities were classified according to similarity, resulting in 20 activities (Table 2). Activities cited only once are not presented in Table 2. From the 15 items cited three or more times, those which were related to an activity and which were not identical or similar to items selected from section A of Pretest 4 were selected for inclusion in the final survey. The following five items were related to an activity, were not present in Pretest 4, and were included in the final questionnaire: 1) having a chance to be alone while hunting, 2) having the same chance as the next person to harvest an animal, 3) having the opportunity to get meat, 4) hunting game animals at different times of the year, and 5) enjoying hunting as a sport. One of the

Table 2. Hunting satisfactions reported to be affected by game laws and regulations by respondents to section B of pretest 1.

Hunting Satisfaction	Number of Times Mentioned
Regulates game populations	20
Promotes safe hunting	11
Induces wildlife preservation, now and in the future	11
Some regulations are too restrictive	11
Sets bag limit on game	8
Having a chance to be alone	6
Surest way to preserve hunting priveleges	5
Egual chance to harvest animal for everyone	4
Pleasure of the outdoors	4
Greater chance of killing game	3
Satisfaction in getting a bag limit and/or reporting that to friends	3
Protects natural resources	3
Varied seasons allow for hunting game at different times of the year	3
Opportunity to get meat	3
Helps enjoy hunting as a sport	3
Aids proper game management	2

Table 2. Hunting satisfactions reported to be affected by game laws and regulations by respondents to section B of pretest 1 (continued).

Hunting Satisfaction	Number of Times Mentioned
Learn a lot by observing animals	2
Have good game laws	2
Shortage of private land on which to hunt	2
Rabbit	2
Other	24

section A, Pretest 4 items did not meet the criterion for inclusion in the final questionnaire but was included because it was mentioned eight times on the open-ended question of section B, Pretest 1.

As with the game laws belief elicitation procedure, there may have been some confusion in completing this section. One of every 4 persons completing section A of pretest 1 did not complete section B. Also, some of the "hunting satisfactions" provided by respondents were apparent non sequiturs (e.g., rabbit, fox hunting, getting away from spouse). It is believed that a few respondents listed hunting satisfactions independent of whether they were affected by game laws and regulations.

Identification of Referents

Question 26 of Pretests 1-3 asked respondents "Who do you feel has had the strongest effect on how you feel about game laws and regulations?" Combined responses on Pretests 1-3 are presented in Table 3. A pretest respondent's father was identified by one of every three persons as having had the strongest effect on attitudes toward game laws and regulations. Current hunting companions were identified by one of every five persons as having the dominant influence. Slightly over one-half of the pretest respondents cited either their father or current hunting companions as having had the strongest effect on self

Table 3. Referents identified as having had the strongest effect on how a pretest respondent felt about game laws and regulations.

Referent	Absolute Frequency	Relative Frequency (Percent)
Father	80	35.2
Present hunting companions	47	20.7
Conservation organizations	15	6.6
Uncle	12	5.3
Previous hunting companions	11	4.8
Church	9	3.9
Grandfather	9	3.9
Present community	8	3.5
Spouse	6	2.7
Brother	6	2.7
Friends who do not hunt	5	2.2
Self	4	1.8
Previous community	3	1.3
Mother	3	1.3
Friend	2	0.9
Son	1	0.4
Persons with whom worked	1	0.4

Table 3. Referents identified as having had the strongest effect on how a pretest respondent felt about game laws and regulations (continued).

Referent	Absolute Frequency	Relative Frequency (Percent)
Father-in-law	1	0.4
Game management agency	1	0.4
Game warden	1	0.4
Entire family	1	0.4
Rod and gun club	1	0.4
Landowners	1	0.4
Total	228	100.0

attitudes toward game laws and regulations.

Those referents cited nine or more times were selected for inclusion in questions of the final survey.

Reliability Analysis

Each of the five n-item attitude scales of section B of Pretest 2 was sequentially reduced to a five-item scale by deleting the item which would result in the highest Cronbach's alpha if deleted, recomputing corrected item-total correlations for the n-1 items, deleting another item, and repeating the cycle. Reliability coefficients for each of the five attitude scales are presented in Table 4. Three analyses are presented, two for before and after a procedure to maximize reliability while reducing items and one for final survey data without the maximization procedure. Cronbach's alpha did not change for two of the five scales and dropped by only 0.01 for the remaining three scales. Four of the five final scales had very high internal consistency reliabilities, above 0.92, while one of the scales (VIOLATESD) had a reliability closely approaching 0.99. Cronbach's alpha computed from final survey data was relatively unchanged from pretest estimates with the exception of the scale for attitudes toward game laws and regulations.

Table 4. Reliability coefficients for each of five attitude scales. Three analyses are presented, two for before and after a procedure to maximize reliability while reducing items and one for final survey data without the maximization procedure.

Attitude Scale	Cronbach's Alpha		Cronbach's Alpha Computed From Final Survey Data
	Before	After	
Game laws and regulations	0.94	0.93	0.76
Sportsmanship	0.88	0.88	0.90
Game law violations	0.99	0.98	0.96
Game law enforcement	0.94	0.93	0.84
Virginia game wardens	0.94	0.94	0.86

Analysis of Final Questionnaire

Response Rate

The number of usable responses to the final questionnaire was 1,245, 40.0 percent of the 3,112 questionnaires mailed initially. Nonresponse on items within the questionnaire was generally less than five percent. An effective response rate (percent of deliverable questionnaires returned) could not be calculated for the final survey because mailings were at the nonreturnable bulk mailing rate. Results of searches of telephone numbers of a selected sample of nonrespondents indicated that the effective response rate was probably over 50 percent. It was possible to locate telephone numbers for approximately 20 percent of selected nonrespondents, in spite of the fact that nationwide more than 90 percent of households have telephones.

Nonresponse Bias

Information on 10 questions (presented previously) was acquired from 50 nonrespondents in telephone interviews. A chi-square (X^2) test of independence was used to test the null hypothesis of no relationship between being a respondent or a telephone-interviewed nonrespondent and pattern of response on each of questions 2, 4, 5, 7, and 13 of questionnaire section A and questions 10 and 11 of section H. A failure to reject the null hypothesis (at

$P \leq 0.10$) occurred in each of the seven X^2 tests, thus supporting a conclusion of no significant difference in responses of respondents and potential responses of nonrespondents. A statistical probability of 0.10 was employed instead of the 0.05 probability used elsewhere because a more stringent criterion for providing an inference regarding nonresponse bias was desired. That is, if rejection of the null hypothesis would support a conclusion of a significant difference, increasing the probability of rejecting a true null hypothesis would result in a stronger basis for concluding differences were not significant. Respondents began hunting at a significantly younger age (mean=13.03) than nonrespondents (mean=13.54); were significantly younger (mean=33.9) than nonrespondents (mean=39.0); and, did not differ significantly in the number of conservation and sportsmen organizations in which they were members (means=1.60 and 1.42 for respondents and nonrespondents, respectively). Because eight of the 10 tests supported a conclusion of no significant difference between respondents and potential responses of nonrespondents, nonresponse bias was presumed to be negligible. Only in questions on age when a person began hunting and age were there significant differences. However, it should be noted that an unknown amount of bias may have been introduced because mailing addresses were

available fo only 60 percent of the population and telephone numbers could be located for only one of every five nonrespondents.

Attitude Scores

The distribution of attitude scores for the variables LAWSD, SPORTSD, VIOLATESD, ENFORCESD, and WARDENSD is presented in Figs. 1-5, respectively. Absolute and relative response frequencies for the five attitudes are presented in Tables 5-9.

Almost one-half of hunters held extremely favorable attitudes toward game laws and regulations (Fig. 1, Table 5). Less than two percent held unfavorable attitudes, about four percent were neutral, and 96 percent held favorable attitudes toward game laws and regulations. The mean ($\pm$S.E.) attitude score of 32.01 ($\pm$0.118) was in the upper range of possible mean scores of 5 to 35 (Table 10).

Attitudes toward sportsmanship in hunting (SPORTSD), game law enforcement (ENFORCESD), and Virginia game wardens (WARDENSD) were generally favorable (Figs. 2-4, Tables 6-8). Mean attitude scores were in the upper range of possible mean scores of 5 to 35 (Table 10).

Attitudes toward game law violations were bimodally distributed (Fig. 5, Table 9). Approximately one-half of the sample was opposed to game law violations, 11 percent were neutral, and 36.6 percent favored game law violations.

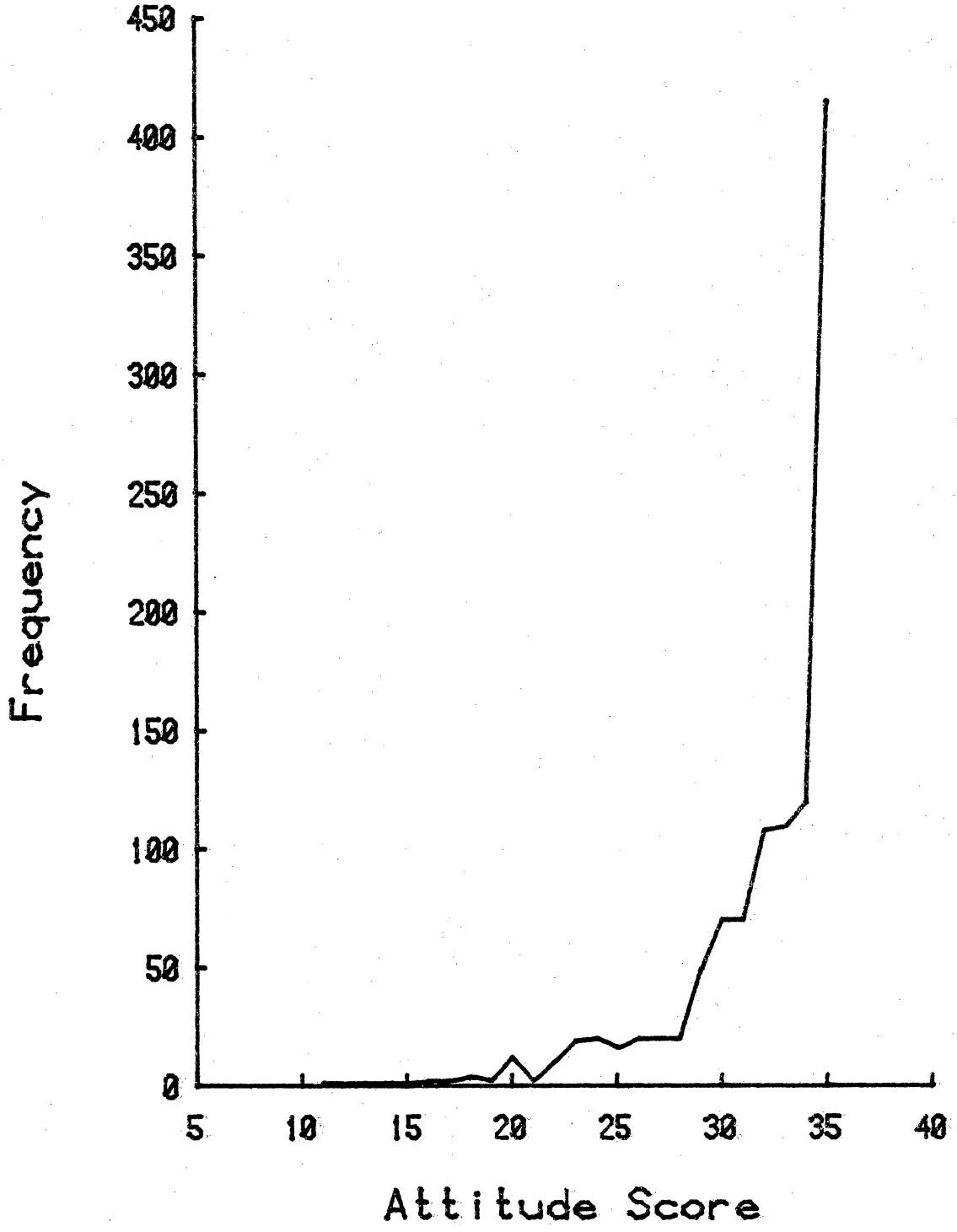

Fig. 1. Distribution of scores for attitudes toward game laws and regulations measured by the semantic differential procedure (LAWSD).

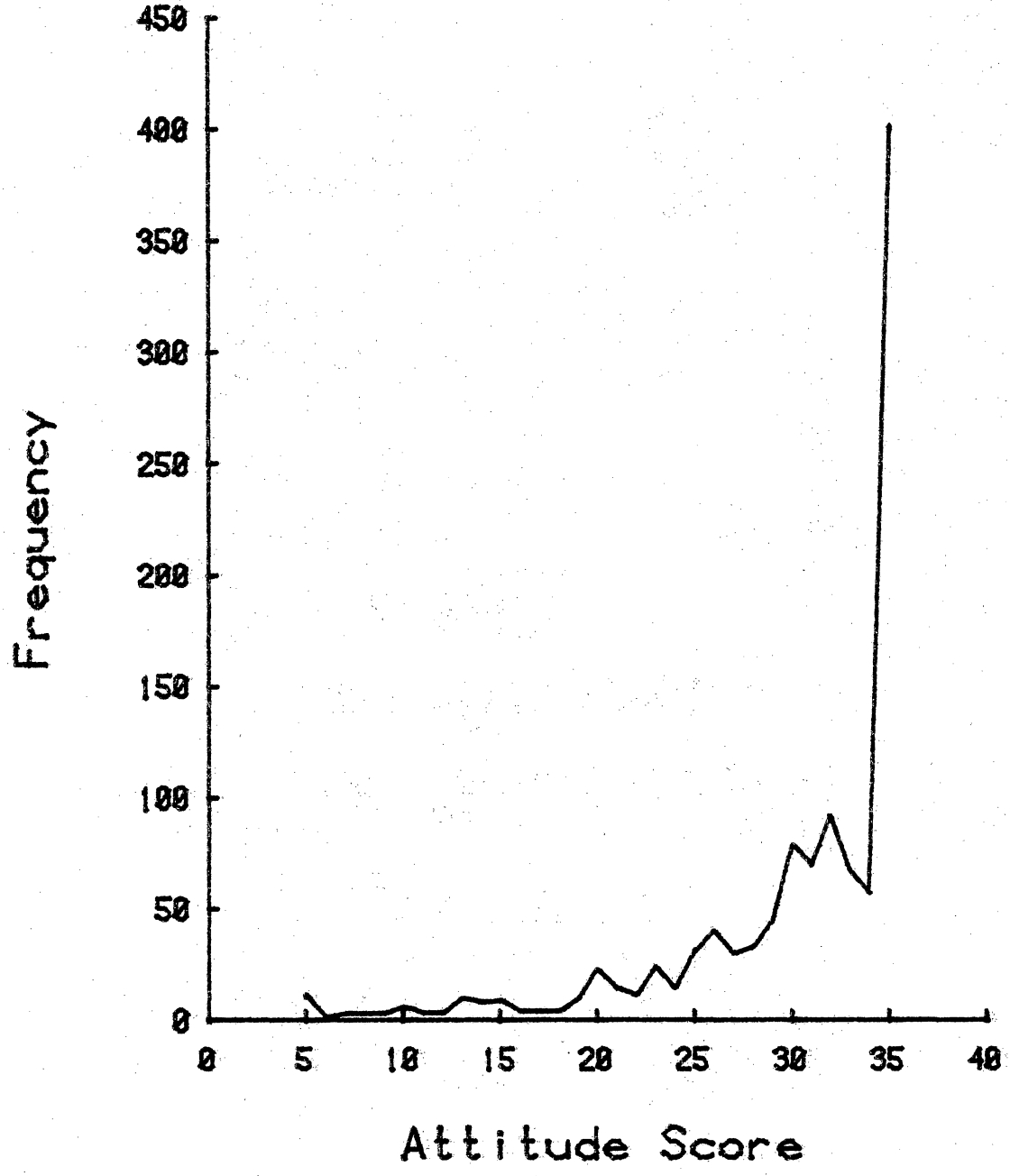

Fig. 2. Distribution of scores for attitudes toward sportsmanship measured by the semantic differential procedure (SPORTSD).

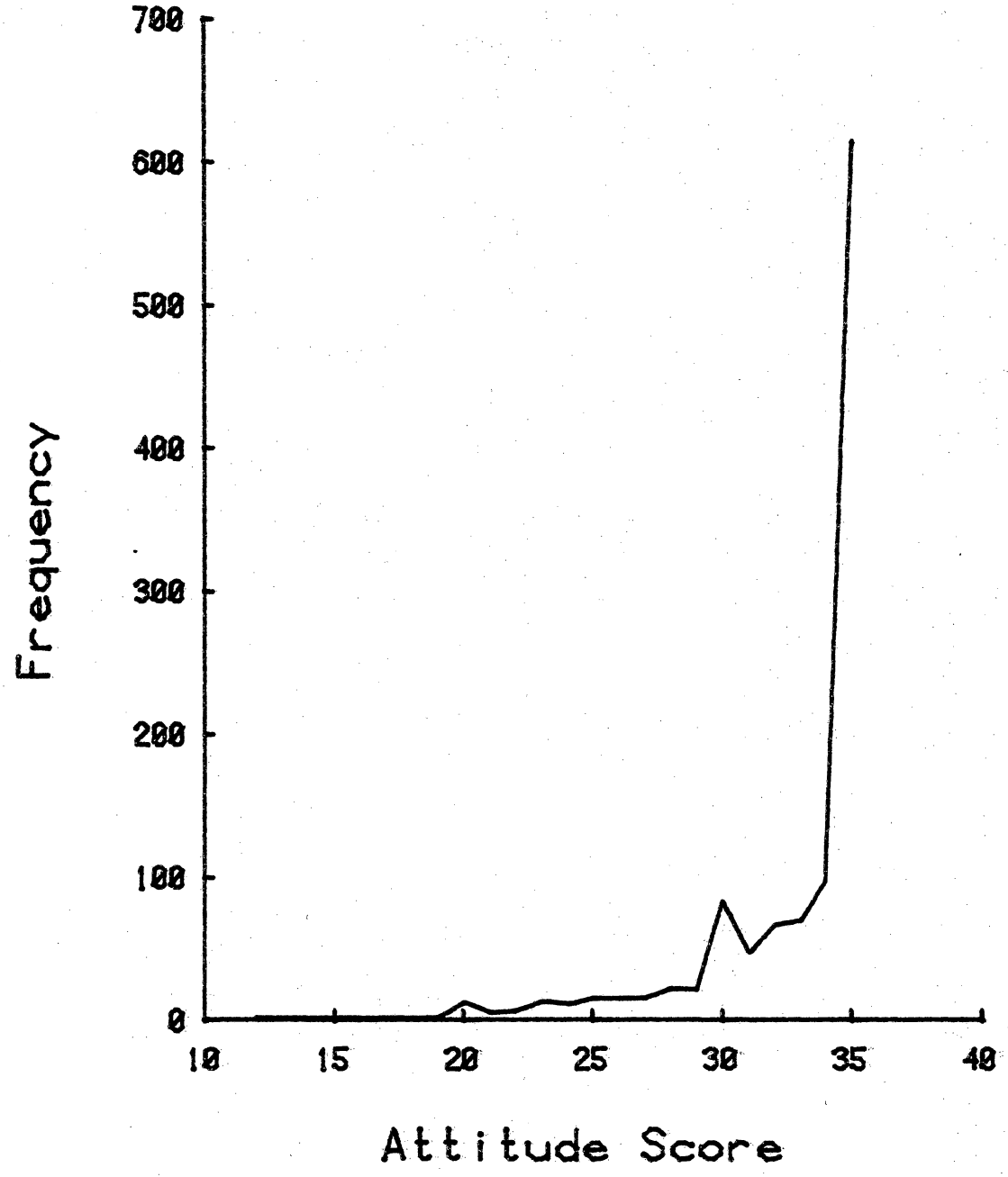

Fig. 3. Distribution of scores for attitudes toward game law enforcement measured by the semantic differential procedure (ENFORCESD).

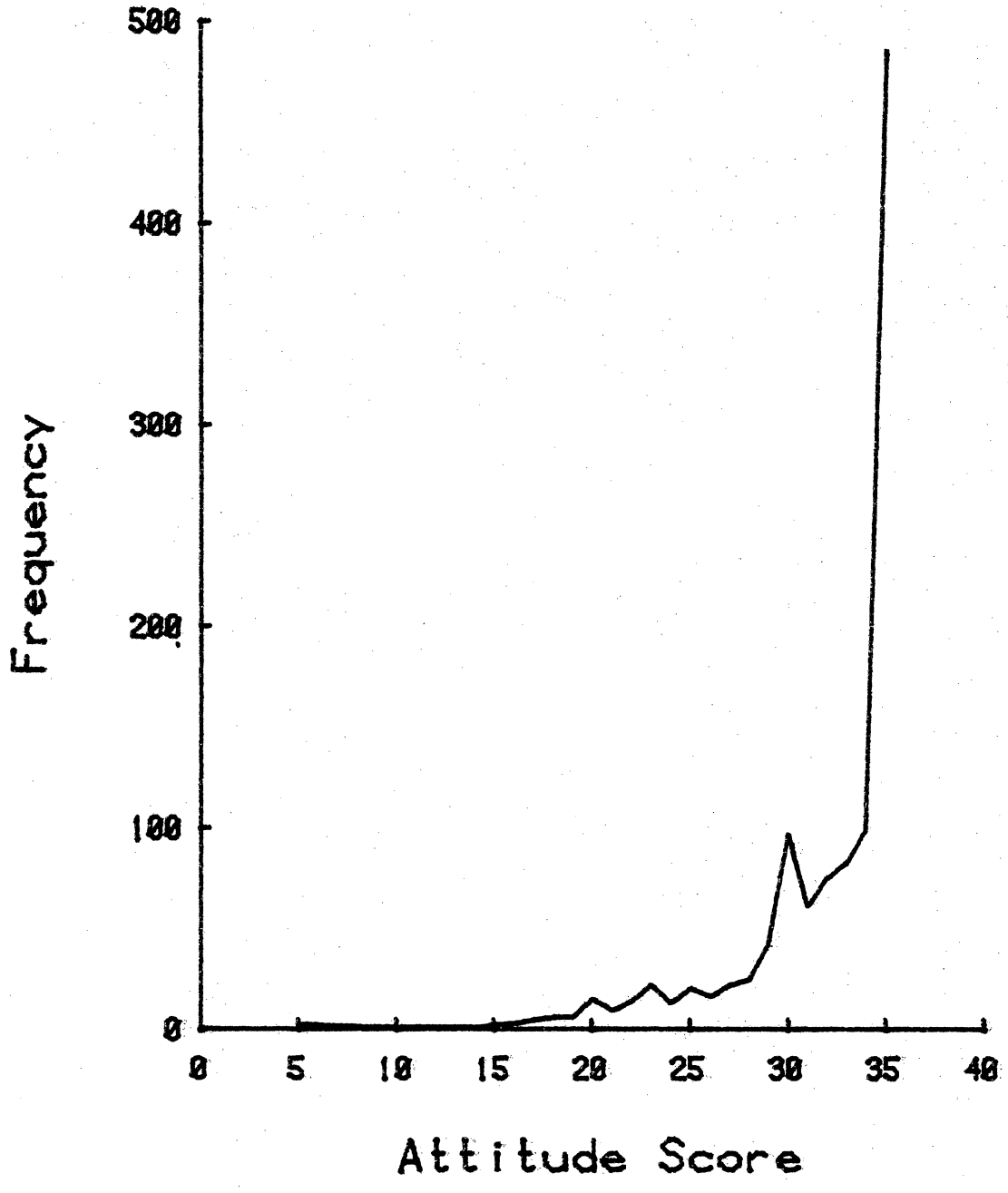

Fig. 4. Distribution of scores for attitudes toward Virginia game wardens measured by the semantic differential procedure (WARDENSD).

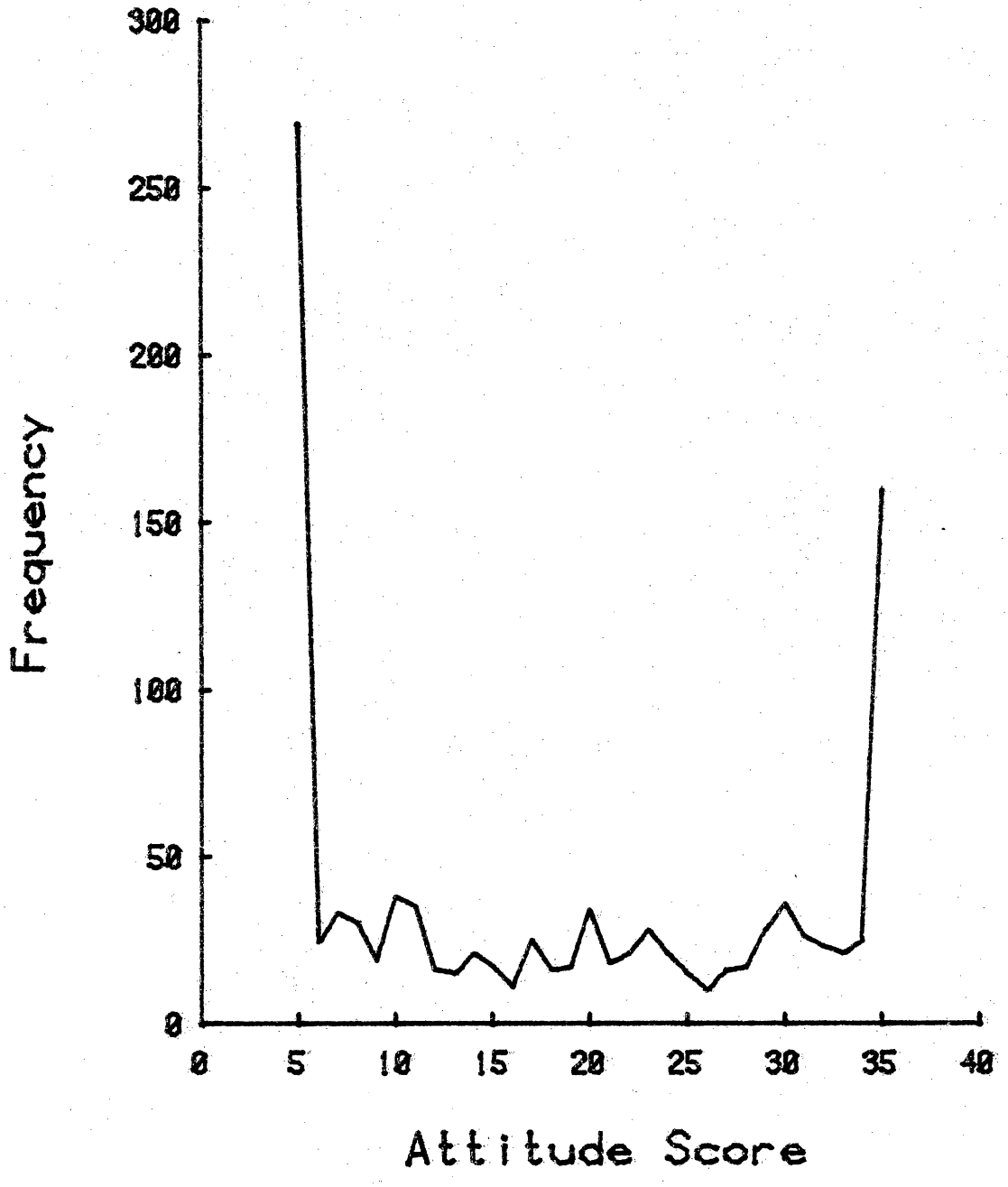

Fig. 5. Distribution of scores for attitudes toward game law violations measured by the semantic differential procedure (VIOLATESD).

Table 5. Categorized scores for attitudes toward game laws and regulations in general.

Attitude Score Range	Absolute Frequency	Relative Frequency (Percent)
5-7[1]	0	0.0
8-13[2]	2	0.2
14-18[3]	10	1.0
19-23[4]	45	4.1
24-28[5]	96	8.7
29-33[6]	407	37.2
34-35[7]	535	48.8
Total	1,095	100.0

[1]Extremely unfavorable
[2]Quite unfavorable
[3]Slightly unfavorable
[4]Neutral
[5]Slightly favorable
[6]Quite Favorable
[7]Extremely favorable

Table 6. Categorized scores for attitudes toward sportsmanship in hunting.

Attitude Score Range	Absolute Frequency	Relative Frequency (Percent)
5-7[1]	15	1.4
8-13[2]	25	2.3
14-18[3]	29	2.7
19-23[4]	82	7.5
24-28[5]	148	13.4
29-33[6]	353	31.8
34-35[7]	459	40.9
Total	1,111	100.0

[1]Extremely unfavorable
[2]Quite unfavorable
[3]Slightly unfavorable
[4]Neutral
[5]Slightly favorable
[6]Quite Favorable
[7]Extremely favorable

Table 7. Categorized scores for attitudes toward game law enforcement.

Attitude Score Range	Absolute Frequency	Relative Frequency (Percent)
5-7[1]	0	0.0
8-13[2]	1	0.1
14-18[3]	4	0.4
19-23[4]	39	3.5
24-28[5]	78	6.9
29-33[6]	288	25.7
34-35[7]	712	63.4
Total	1,122	100.0

[1]Extremely unfavorable
[2]Quite unfavorable
[3]Slightly unfavorable
[4]Neutral
[5]Slightly favorable
[6]Quite Favorable
[7]Extremely favorable

Table 8. Categorized scores for attitudes toward Virginia game wardens.

Attitude Score Range	Absolute Frequency	Relative Frequency (Percent)
5-7[1]	2	0.2
8-13[2]	1	0.1
14-18[3]	17	1.5
19-23[4]	66	5.8
24-28[5]	96	8.6
29-33[6]	308	31.8
34-84[7]	535	51.9
Total	1,074	100.0

[1]Extremely unfavorable
[2]Quite unfavorable
[3]Slightly unfavorable
[4]Neutral
[5]Slightly favorable
[6]Quite Favorable
[7]Extremely favorable

Table 9. Categorized scores for attitudes toward game law violations.

Attitude Score Range	Absolute Frequency	Relative Frequency (Percent)
5-7[1]	326	30.0
8-13[2]	138	12.8
14-18[3]	90	8.3
19-23[4]	118	10.9
24-28[5]	79	7.3
29-33[6]	134	12.3
34-35[7]	185	17.0
Total	1,085	100.0

[1]Extremely unfavorable
[2]Quite unfavorable
[3]Slightly unfavorable
[4]Neutral
[5]Slightly favorable
[6]Quite Favorable
[7]Extremely favorable

Table 10. Means and standard deviations for five attitudes measured by the semantic differential procedure and a single category rating scale.

Attitude	Semantic Differential Mean[1]	Semantic Differential S.D.	Category Rating Mean[2]	Category Rating S.D.
Game laws and regulations	32.01	3.91	6.40	0.96
Sportsmanship	30.11	6.35	6.61	0.89
Game law violations	18.28	11.54	3.06	2.43
Game law enforcement	32.80	3.69	6.53	0.86
Virginia game wardens	31.80	4.47	6.22	1.11

[1]Means can range from 5 to 35.
[2]Means can range from 1 to 7.

The bimodal distribution resulted in the mean of attitude scores being in the slightly opposed-neutral range.

None of the five distributions appear to be distributed normally, an assumption underlying most parametric statistical tests. Application of the Kolmogorov-Smirnoff goodness of fit test for normality to each of the five distributions resulted in rejection of the null hypothesis of an underlying normal distribution for each distribution. Null hypotheses were rejected both before and after common logarithm and square root transformation of data. Caution should be exercised when interpreting the results of several parametric statistical tests reported (e.g., multiple regression). However, many parametric statistical procedures are robust to non-normality (somewhat insensitive to violation of the normality assumption) and in these cases less caution would be dictated (Kerlinger and Pedhazur 1973:47-48).

The correlation between each of the two measures of attitudes ranged from low to moderate with an average Spearman's rho of 0.52 (Table 11). Correlation was lowest between the two measures of attitudes toward sportsmanship in hunting (rho=0.37) and highest between the two measures of attitudes toward Virginia game wardens (rho=0.64). These relatively small correlations could not be explained by unreliability in semantic differential measures because

Table 11. Correlation between semantic differential and category rating scale measures of attitudes for each of five attitudes.

Attitude	Correlation Between Two Attitude Measures[1]
Game laws	0.45
Sportsmanship	0.37
Violations	0.60
Enforcement	0.53
Game wardens	0.64

[1]Correlation estimate is Spearman's rho. All correlations are significantly different from 0 at $P \leq 0.001$.

reliability was generally high and acceptable. Semantic differential measures of attitudes were employed when searching for relationships and when testing hypotheses.

Intercorrelations among the five attitude measures ranged from a low of r=0.00 (rho=-0.14) between SPORTSD and VIOLATESD (and their category rating scale counterparts) to a high of r=0.66 (rho=0.53) between ENFORCESD and WARDENSD (Tables 12 and 13). Correlations were moderate between attitudes toward game laws and enforcement (r=0.56) and game laws and wardens (r=0.46). Correlations between attitudes toward game law violations and each of the other four attitudes were in the expected negative direction, although they were relatively weak (r=0.00 to r=-0.08, rho=-0.14 to rho=-0.25). As attitude scores increase in opposition to game law violations, attitude scores increase in favorableness toward sportsmanship in hunting, game laws and regulations, game law enforcement, and Virginia game wardens.

Hypothesis Testing

The major research hypothesis was that the sum of products of value importance and perceived instrumentality (SUMVIPI), the sum of modal BIAI products (MODPROD), and the mean product of referent attitude and willingness to comply (REFERENTS) were related in an additive manner to attitudes toward game laws and regulations (LAWSD). This

Table 12. Pearson product-moment correlation matrix for five attitudes measured by the semantic differential procedure.

Attitude	Attitudes				
	Laws	Sportsmanship	Violations	Enforcement	Wardens
Game laws	----	0.22[1]	-0.09[1]	0.56[1]	0.46[1]
Sportsmanship	----	----	0.00	0.19[1]	0.19[1]
Violations	----	----	-----	-0.08[1]	-0.05
Enforcement	----	----	-----	-----	0.66[1]

[1] H_o : $r=0$ rejected at $P \leq 0.05$.

Table 13. Spearman's rho correlation matrix for five attitudes measured by a single category rating scale.

Attitude	Attitudes				
	Laws	Sportsmanship	Violations	Enforcement	Wardens
Game laws	----	0.37[1]	-0.24	0.52	0.45
Sportsmanship	----	----	-0.14	0.31	0.25
Violations	----	----	-----	-0.25	-0.14
Enforcement	----	----	-----	-----	0.53

[1]All correlations significantly different from 0 at $P \leq 0.0001$.

model also implies that LAWSD is correlated with each of SUMVIPI, MODPROD, and REFERENTS when examined individually. LAWSD was slightly correlated with MODPROD (r=0.29) and REFERENTS (r=0.30) to a nearly equal degree and much less correlated with SUMVIPI (r=0.12, Table 14). A forward selection multiple regression technique was used to test the hypothesis that SUMVIPI, MODPROD, and REFERENTS were related in an additive manner to LAWSD. Three two-way and one three-way interaction terms were included in the model to test for the presence of unhypothesized interaction. Thus, the model tested was:

$$\hat{\text{Attitudes}}_{\text{laws}} = \beta_1 \text{SUMVIPI} + \beta_2 \text{MODPROD} + \beta_3 \text{REFERENTS} + \beta_4 \text{SUMVIPI*MODPROD} + \beta_5 \text{SUMVIPI*REFERENTS} + \beta_6 \text{MODPROD*REFERENTS} + \beta_7 \text{SUMVIPI*MODPROD*REFERENTS}$$

The results of the multiple regression are shown under the column for regression number one in Table 15. Based on variable entry and retention criteria of $P \leq 0.10$, MODPROD, REFERENTS, and a two-way interaction term, MODPROD*REFERENTS, were retained in the final model. MODPROD*REFERENTS had the highest beta statisic ($\beta=-0.88$), followed by REFERENTS ($\beta=0.84$) and MODPROD ($\beta=0.73$). Only 16 percent of the variance about the mean of LAWSD was

Table 14. Intercorrelation matrix for the variables LAWSD, SUMVIPI, MODPROD, DEVPROD, SUMAIBI, REFERENTS, and PEOPPROD.[1]

Variable	Correlation[2]						
	LAWSD	SUMVIPI	MODPROD	DEVPROD	SUMAIBI	REFERENTS	PEOPPROD
LAWSD	-----	0.12[3]	0.29	0.15	0.26	0.30	0.27
SUMVIPI	-----	----	0.20	0.19	0.11	-0.18	0.07
MODPROD	-----	----	----	0.55	0.82	0.11	0.23
DEVPROD	-----	----	----	----	0.74	0.12	0.21
SUMAIBI	-----	----	----	----	----	0.13	0.24
REFERENTS	-----	----	----	----	----	-----	0.21

[1]A description of each of the variables is provided in the text.
[2]Pearson product-moment correlation coefficients.
[3]H : r=0 rejected at $P \leq 0.05$ for all correlations.

Table 15. Summary of multiple regressions of LAWSD on major predictor variables.

Independent Variable	Regression Number				
	1[1]	2	3	4	5
SUMVIPI	-----[2]	0.35	-----	-----	-----
SUMAIBI				-----	-----
MODPROD	0.73	0.61			
DEVPROD		-----			
REFERENTS	0.84		0.68	-----	
PEOPPROD			0.52		-----
SUMVIPI*MODPROD	-----	0.46			
SUMVIPI*REFERENTS	-----		-----	-----	
MODPROD*REFERENTS	-0.88				
SUMVIPI*DEVPROD		-----			
MODPROD*DEVPROD		-----			
SUMVIPI*PEOPPROD			-----		-----
REFERENTS*PEOPPROD			-0.76		
SUMVIPI*SUMAIBI				-----	-----
SUMAIBI*REFERENTS				0.33	
SUMAIBI*PEOPPROD					0.40
SUMVIPI*MODPROD* REFERENTS	-----				

Table 15. Summary of multiple regressions of LAWSD on major predictor variables (continued).

Independent Variable	Regression Number 1[1]	2	3	4	5
SUMVIPI*MODPROD* DEVPROD		-----			
SUMVIPI*REFERENTS* PEOPPROD			-----		
SUMVIPI*SUMAIBI* REFERENTS				-----	
SUMVIPI*SUMAIBI* PEOPPROD					-----
R^2 (adjusted)	0.16	0.11	0.12	0.11	0.10

[1] Entries are standardized partial regression coefficients (betas). All coefficients and regressions are significant at $P \leq 0.10$.

[2] Variables tested for a regression are indicated by the presence of a dashed line or a coefficient in a column.

explained by the three-variable model. The interaction was not hypothesized, and the presence of a negative β is contrary to what would be expected based on the nature of the independent variables. However, because of multicolinearity and the fact that the interaction term was a combination of two retained variables, the negative β may be spurious. The interaction term, MODPROD*REFERENTS, had a higher simple correlation with LAWSD (r=0.35) than did MODPROD (r=0.29) and REFERENTS (r=0.30). This and the large β coefficient of the interaction term may indicate that Fishbein's two models have a multiplicative and additive influence on attitudes toward game law and regulations. The sum of products of value importance and perceived instrumentality (SUMVIPI), although slightly correlated with LAWSD, was not a significant variable in the multiple regression model.

To determine the relative influence of comparative independent variables (i.e., MODPROD versus DEVPROD, REFERENTS versus PEOPPROD), the following multiple regressions were tested (the number next to an equation corresponds to the indicated regression number in Table 15):

$$2.\quad \hat{A}ttitudes_{laws} = \beta_1 SUMVIPI + \beta_2 MODPROD + \beta_3 DEVPROD + \beta_{4-7} INTERACTION\ TERMS$$

3. $\hat{\text{Attitudes}}_{\text{laws}} = \beta_1 \text{SUMVIPI} + \beta_2 \text{REFERENTS} + \beta_3 \text{PEOPPROD} + \beta_{4-7} \text{INTERACTION TERMS}$

4. $\hat{\text{Attitudes}}_{\text{laws}} = \beta_1 \text{SUMVIPI} + \beta_2 \text{SUMBIAI} + \beta_3 \text{REFERENTS} + \beta_{4-7} \text{INTERACTION TERMS}$

5. $\hat{\text{Attitudes}}_{\text{laws}} = \beta_1 \text{SUMVIPI} + \beta_2 \text{SUMBIAI} + \beta_3 \text{PEOPPROD} + \beta_{4-7} \text{INTERACTION TERMS}$

The sum of value importance and perceived instrumentality products (SUMVIPI) occurred as a significant independent variable in one of the five models tested. The sum of 14 BIAI products (SUMBIAI) was not a significant variable in the two models in which it was considered. Five two-way interactions were present among the five models.

The sum of modal BIAI products (MODPROD) appears to be a better predictor of attitude toward game laws than the sum of developed characteristic products (DEVPROD) based on a higher simple correlation with LAWSD ($r=0.29$ versus $r=0.15$), the retention of MODPROD in regression number two, and the results of partial correlation tests. The correlation between LAWSD and MODPROD ($r=0.29$) was reduced only slightly when DEVPROD was controlled (partial $r=0.23$),

whereas the correlation between LAWSD and DEVPROD (r=0.15) was reduced completely when MODPROD was controlled (partial r=-0.01).

Although the mean of products of perceived referent attitude and willingness to comply with referent products (REFERENTS) and PEOPPROD were correlated with LAWSD to approximately the same degree (r=0.30 and r=0.27, respectively), REFERENTS remained in two of the three models in which it was tested in contrast to retention of PEOPPROD in one of the three models. REFERENTs and PEOPPROD show identical relationships with LAWSD when each is controlled separately. The correlation between REFERENTS and LAWSD (r=0.30) was reduced somewhat when PEOPPROD was controlled (partial r=0.18); the correlation between PEOPPROD and LAWSD (r=0.27) was reduced to the same partial correlation when REFERENTS was controlled (partial r=0.18). The amount of variance about the mean of LAWSD predicted by the five different models was low, ranging from 0.10 for regression five to 0.16 for regression one (mean R^2=0.12). None of the five regression models, including the primary model investigated, would be considered predictive of attitudes toward game laws and regulations.

LAWSD was regressed on the 36 products of value importance and perceived instrumentality to examine the

relative contribution of each product in predicting attitudes toward game laws and regulations (Table 16). "Taking advantage of lax law enforcement" and "bringing game home" had the largest beta coefficients, both negative. As attitudes toward game laws and regulations become more favorable, the importance of taking advantage of lax law enforcement and/or the effect of game laws and regulations on taking advantage of lax law enforcement decreases. The same relationship holds for satisfaction obtained from taking game home. The "amount of game bagged," "relaxing and relieving tensions," and "getting a bag limit" were positively related to attitudes toward game laws and regulations. The final nine-variable model explained only 11 percent of the variance in attitudes toward game laws and regulations.

When LAWSD was regressed on the 14 products of attribute evaluation and belief strength, the final six-variable model contained two modal products and four nonmodal (developed) products (Table 17). A significantly greater number of developed characteristic products were retained in the model than would have been expected based on chance alone. Although a disproportionately high number of developed characteristics were retained in the model, the major independent variables discussed previously were the <u>sum</u> of modal products of attribute evaluation and

Table 16. Summary of multiple regression of LAWSD on products of value importance and perceived instrumentality.

Hunting Satisfaction	Beta	H_o :B=0 Rejected at P≤
Taking advantage of lax law enforcement sometimes	-0.29	0.0001
Bringing game home	-0.18	0.0001
Amount of game bagged	0.17	0.0096
Relaxing and relieving tensions	0.14	0.0035
Shooting female game	-0.12	0.0629
Hunting from roads	-0.12	0.0325
Seeing very few other hunters while hunting	-0.11	0.0096
Enjoying hunting as a sport	0.09	0.0335
Getting a bag limit	0.08	0.0709
R^2(adjusted) = 0.11[1]		

[1] Adjusted $R^2 = R^2 - \frac{(k-1)}{(N-k)} (1-R^2)$

where k = number of independent variables in the regression equation
N = number of cases

Table 17. Summary of multiple regressions of LAWSD on products of belief strength and attribute evaluation.

Attribute	Beta	H_o :B=0 Rejected at P≤
Provide for good game management	0.23	0.0001
Too many	-0.13	0.0003
Provide every hunter an equal chance to harvest an animal	0.10	0.0025
Intelligently thought out	0.10	0.0124
Difficult to interpret	-0.10	0.0066
Provide for conservation	0.09	0.0196
R^2 (adjusted) = 0.20		

belief strength (MODPROD) and the sum of developed products of attribute evalution and belief strength (DEVPROD). Previous comparisons suggested that MODPROD was a better predictor of LAWSD than DEVPROD.

The beta coefficients in Table 17 are in the expected direction. The four positive attributes have positive coefficients and the two negative attributes have negative coefficients. The final six-variable model explained 20 percent of the variance in attitudes toward game laws and regulations.

Only two variables were retained in a multiple regression model when LAWSD was regressed on seven products of perceived referent attitude and willingness to comply with referent (Table 18). The product of perceived attitudes of conservation organizations times willingness with expectations of conservation organizations produced a larger beta statistic than for a simlarly-computed product for hunting companions. The two-variable model explained less than 10 percent of the variance in attitudes toward game laws and regulations.

Correlates of Attitudes

The second major research objective was to determine correlates of attitudes of Virginia hunters toward game laws and regulations in general, game law enforcement, Virginia game wardens, game law violations, and

Table 18. Summary of multiple regression of LAWSD on products of perceived referent attitude and willingness to comply with referent expectations.

Referent	Beta	H_o :B=0 Rejected at P≤
Conservation organizations	0.22	0.0001
Present hunting companions	0.17	0.0001
Father	----	------
Grandfather	----	------
Uncle	----	------
Church	----	------
Previous hunting companions	----	------
R^2 (adjusted) = 0.08		

sportsmanship in hunting. Potential correlates in this research are hunting-related variables of questionnaire section A and background variables of section H. Before searching for relationships between each of the attitudes and nominal and ordinal variables, each of the attitude measures was recoded to a five-point ordinal scale to maintain adequate cell density in contingency tables.

Associations with nominal variables

Significant associations between LAWSD, SPORTSD,, VIOLATESD, ENFORCESD, WARDENSD, and nominal background and hunting-related variables are presented in Table 19. Although four of the associations between LAWSD and nominal variables were statistically significant, only one, an eta^2 of 0.10 between LAWD and "being irritated by a 1977-78 warden inspection," is appreciable. Warden inspections of hunters were not associated with attitudes toward game laws and regulations but perceptions of being irritated by a warden contact were related to attitudes toward game laws and regulations. Of those persons reporting irritating warden contacts, 48.3 percent had game laws' attitude scores in the 29-35 range. Among those persons not reporting irritating contacts, 86.4 percent had game laws' attitude scores in the 29-35 range. Perceived irritating warden contacts were also associated with attitudes toward game law enforcement (eta^2=0.10) and Virginia game wardens

Table 19. Significant associations between LAWSD, SPORTSD, VIOLATESD, ENFORCESD, WARDENSD and eight nominal background and hunting-related variables.[1]

Background Variable	Attitudes				
	LAWSD	SPORTSD	VIOLATESD	ENFORCESD	WARDENSD
Hunted in Virginia in 1977-78	----	----	----	----	0.01 (1,120)
Inspected by a Virginia game warden in 1977-78	----	----	0.01 (1,075)	----	----
Irritated by a 1977-78 warden contact	0.10 (308)	----	0.01 (310)	0.10 (314)	0.08 (315)
Irrated by a warden contact in the past	0.03 (1,082)	----	----	0.20 (1,108)	0.04 (1,110)
Received a warning and/or a citation during 1973-1978	0.01 (1,084)	----	0.01 (1,075)	0.02 (1.110)	0.04 (1,112)
Occupational class	----	----	0.04 (1,027)	----	0.02 (1,063)

Table 19. Significant associations between LAWSD, SPORTSD, VIOLATESD, ENFORCESD, WARDENSD and eight nominal background and hunting-related variables (continued).

Background Variable	Attitudes				
	LAWSD	SPORTSD	VIOLATESD	ENFORCESD	WARDENSD
Main wage-earner in household	----	0.01 (1,096)	0.01 (1,072)	0.01 (1,107)	0.02 (1,110)
Working status	0.01 (1,071)	0.02 (1,087)	0.01 (1,062)	----	----

[1] Associations are eta^2 and are significantly different from 0 at $P \leq 0.05$. Sample sizes are in parentheses.

(eta^2=0.08). Almost one-half of people reporting being bothered by a warden contact had ENFORCESD scores in the 29-35 range in contrast to 89.8 percent of persons not reporting being bothered by a warden contact. Approximately the same percentage difference occurred for attitudes toward Virginia game wardens.

Receiving a warning and/or a citation for violation of a Virginia game law between 1973 and 1978 was associated with attitudes toward Virginia game wardens. One-third of persons receiving a warning and a citation between 1973 and 1978 had WARDENSD attitude scores in the 29-35 range in contrast to 85.2 percent of persons not receiving a warning and citation.

No significant associations were identified between LAWSD, SPORTSD, VIOLATESD, ENFORCESD, WARDENSD, and the person who initiated a respondent into hunting; having completed a hunter safety course; approval by father of hunting in general; number of persons with whom a respondent normally hunted; knowledge of the name of the local game warden or personal friendship with the local warden; gender; and, past or present membership in Boy Scouts or 4-H Clubs.

Associations with ordinal variables

Associations between the five attitudes and ordinal variables are shown in Table 20. The amount of hunting

Table 20. Significant associations between LAWSD, SPORTSD, VIOLATESD, ENFORCESD, WARDENSD and five ordinal background and hunting-related variables.[1]

Background Variable	Attitudes				
	LAWSD	SPORTSD	VIOLATESD	ENFORCESD	WARDENSD
Days currently hunted per year	-----	----	0.04 (1,078)	----	-0.04
Hunting satisfaction relative to expectation in 1977-78	0.16 (1,035)	0.15 (1,047)	----	----	-----
Percent of friends who	-0.05 (1,092)	----	----	----	0.03 (1,121)
Present size of residence community	0.22 (1,073)	----	----	----	-----
Income	-----	----	----	0.01 (1,032)	-----

[1]Associations are asymmetrical gamma and are significantly different from 0 at $P \leq 0.05$. Sample sizes are in parentheses.

satisfaction received in 1977-78 relative to expectations was positively related to attitudes toward game laws and regulations (gamma=0.17). Approximately 80 percent of persons reporting hunting was much better than expected had LAWSD scores in the 29-35 range as compared with 69 percent of the people who report that hunting was much worse than expected. The amount of hunting satisfaction received relative to expectations was also positively related to attitudes toward sportsmanship in hunting (gamma=0.15). The association highest in magnitude occurred between LAWSD and the present size of the residence community of the hunter. Larger community populations were associated with more favorable attitudes toward game laws and regulations (gamma=0.22).

No significant associations were identified between LAWSD, SPORTSD, VIOLATESD, ENFORCESD, WARDENSD, and days hunted per year as a youth and the size of the community of residence as a youth.

Correlations with interval variables

Attitudes toward game laws and regulations were positively correlated with the number of years a respondent had hunted (r=0.07), the number of outdoor and conservation magazines to which a respondent subscribed (r=0.06), the age of the respondent (r=0.11), and the number of years of formal education (r=0.10, Table 21). Although the above

Table 21. Significant correlations between LAWSD, SPORTSD, VIOLATESD, ENFORCESD, WARDENSD and seven interval-level background and hunting-related variables.[1]

Background Variable	Attitudes				
	LAWSD	SPORTSD	VIOLATESD	ENFORCESD	WARDENSD
Number of years hunted	0.07 (1,090)	-0.10 (1,106)	-0.09 (1,081)	0.09 (1,117)	0.15 (1,119)
Number of conservation organizations a member of	----	0.06 (1,098)	-0.08 (1,072)	-----	-----
Number of outdoor and conservation magazines to which subscribe	0.06 (1,087)	-----	-0.09 (1,097)	-----	0.07 (1,117)
Number of times irritated by a warden contact	----	-----	-----	-0.26 (165)	-0.31 (164)
Number of warnings and citations received from 1973 to 1978	----	-----	-----	-0.31 (74)	-0.46 (75)

Table 21. Significant correlations between LAWSD, SPORTSD, VIOLATESD, ENFORCESD, WARDENSD and seven interval-level background and hunting-related variables (continued).

Background Variable	Attitudes				
	LAWSD	SPORTSD	VIOLATESD	ENFORCESD	WARDENSD
Age	0.11 (1,086)	-0.09 (1,101)	-0.07 (1,076)	0.10 (1,112)	0.18 (1,115)
Years of formal education	0.10 (1,081)	-----	-0.20 (1,071)	0.08 (1,108)	-----

[1]Correlations are Pearson product-moment correlations and are significantly different from 0 at $P \leq 0.05$. Sample sizes are in parentheses.
[2]Self-reported.

correlations were statistically significant, they explained about one percent of the variance in attitudes toward game laws and regulations.

The only correlations of appreciable size occurred between the number of reported irritating contacts and attitudes toward game law enforcement and Virginia game wardens (r=-0.26 and -0.31, respectively); and, the number of warnings and citations received from 1973 to 1978 and attitudes toward enforcement and wardens (r=-0.31 and -0.46, respectively). The tendency was for attitudes toward enforcement and wardens to become less favorable as the number of reported irritating contacts and the number of citations received increased. The number of times a hunter had been inspected by wardens between 1975 and 1978 was not related to the five attitudes. Also unrelated were the respondent's age when he or she began hunting and the number of game species the respondent hunted in 1977-78.

It was initially thought that law enforcement contact variables would be cumulative in their effect on attitudes toward game laws and regulations. Five different levels and types of enforcement contact with hunters were created and LAWSD means computed for each level of contact (Table 22). No apparent trend was discovered between presumed increasing negative evaluation when moving from levels one to five and estimates of attitudes toward game laws and

Table 22. Attitudes toward game laws and regulations associated with different levels and types of contact with game wardens.

Level of Contact	Number in Group	Attitude Score Mean	S.D.
1. Not inspected in 1975-1978, no citation received	622	28.6	10.7
2. Inspected in 1977-1978 and 1975-1978, inspected once, not bothered by inspection, one citation received	41	28.4	10.2
3. Inspected in 1977-78 and 1975-1978, inspected more than once but less than or equal to four times, not bothered by inspections, no citations received	104	28.0	12.1
4. Inspected in 1977-1978 and 1975-1978, inspected four or more times, bothered four or more times by inspections, no citations received	51	29.3	10.5
5. Inspected in 1977-1978 and 1975-1978, inspected four or more times, bothered four or more times by inspections, one or more citations received	8	32.0	4.0

regulations.

Rosenberg's Model

In section E of the final questionnaire, hunters were asked to indicate the degree to which game laws and regulations help or hinder the attainment of satisfaction they receive from each of 36 hunting activities. Hunters receiving no satisfaction, or receiving dissatisfaction, from an activity were requested to circle the neutral category. An inconsistent response was coded when a person who received no satisfaction or who received dissatisfaction from an activity of section D reported that game laws affected his or her satisfaction in section E. Inconsistent responses in section E were recoded to a neutral value of five. The number of inconsistent responses ranged from 0 (n=73) to 26 (n=2). A suprisingly low percentage (5.9) of hunters made no inconsistent responses. There was a mean ($\pm$S.E.) of 5.69 ($\pm$0.10) inconsistent responses made by each individual.

Perceived instrumentality (the degree to which game laws affect satisfaction) means and standard deviations for the 36 hunting activities of section E are presented in Table 23. Mean perceived instrumentality ratings ranged from a high of 7.37 for "at least seeing some wildlife" to a low of 4.96 for "shooting nongame animals while hunting." It was intended that "nongame" designate regulated and

Table 23. Perceived instrumentality means and standard deviations for 36 hunting activities.[1]

Hunting Activity	Perceived Instrumentality Mean	Standard Deviation
At least seeing some wildlife	7.37	1.50
Enjoying hunting as a sport	7.32	1.61
Being close to nature	7.08	1.70
Having access to free hunting areas	7.07	1.86
Just being outdoors	6.99	1.70
Having the same chance as the next person to harvest an animal	6.86	1.66
Feeling safe while carrying a gun	6.80	1.74
Being thought of as a skilled hunter	6.75	1.73
Teaching someone else the skills of hunting	6.73	1.61
Bagging naturally wild versus planted game	6.56	1.65
Bringing game home	6.56	1.60
Being with hunting companions	6.56	1.58
Relaxing and relieving tensions	6.53	1.66
Planning a hunting trip	6.50	1.64

Table 23. Perceived instrumentality means and standard deviations for 36 hunting activities (continued).

Hunting Activity	Perceived Instrumentality Mean	Standard Deviation
Hunting as a chance for recreation (game is secondary)	6.50	1.60
Getting away from civilization	6.50	1.69
Killing game	6.44	1.58
Getting away from people	6.43	1.70
Bagging a very large mammal or bird	6.27	1.61
Having the opportunity to get meat	6.25	1.65
Having a chance to be alone	6.23	1.65
Hunting game at different times of the year	6.21	1.86
Getting a bag limit	6.20	1.54
Getting at least a few shots	6.17	1.49
The amount of game bagged	6.12	1.61
Giving game to less successful hunters	5.96	1.44
Giving game to others	5.91	1.46
Seeing very few other hunters while hunting	5.84	1.58

Table 23. Perceived instrumentality means and standard deviations for 36 hunting activities (continued).

Hunting Activity	Perceived Instrumentality Mean	Standard Deviation
Being free to do what is desired while hunting	5.75	1.70
Being on a highly organized hunt	5.74	1.39
Shooting female game	5.12	0.79
Target practicing while hunting (plinking)	5.05	0.67
Hunting from roads	5.04	0.87
Taking small risks	5.03	0.71
Taking advantage of lax law enforcement sometimes	4.99	0.68
Shooting nongame animals while hunting	4.96	0.62

[1]Means can range from 1 (extremely hinders) to 9 (extremely helps).

huntable but not game species (e.g., Eastern woodchuck, Marmota monax). All mean responses ranged from "no effect" to "extremely helps." None of the hunting activities was reported by a majority of hunters as being hindered by the presence of game laws and regulations.

Means and standard deviations for 36 products of value importance and perceived instrumentality products are presented in Table 24. When the importance of the hunting activity was considered, game laws and regulations had the highest satisfaction-facilitating affect on enjoying hunting as a sport (mean=63.10), being close to nature (mean=61.39), and at least seeing some wildlife (mean=61.33). Game laws and regulations had the most dampening effect on shooting nongame animals while hunting (mean=14.46), target practicing while hunting (mean=17.86), and hunting from roads (mean=18.81).

Fishbein's Beliefs-Based Model

Means and standard deviations for the 14 belief strength scales, attribute evaluation scales, and BIAI products are presented in Tables 25-27, respectively.

Hunters reported that the statement "game laws and regulations provide for good game management" was the most true (mean=6.26) and that "game laws and regulations are too restrictive" was least true (mean=2.76, Table 24). Hunters were uncertain about the difficulty of remembering

Table 24. Means and standard deviations for products of value importance and perceived instrumentality for 36 hunting activities.[1]

Hunting Activity	Value Importance*Perceived Instrumentality	
	Mean	Standard Deviation
Enjoying hunting as a sport	63.10	23.71
Being close to nature	61.39	21.88
At least seeing some wildlife	61.33	18.54
Just being outdoors	60.33	22.20
Having access to free hunting areas	59.50	22.42
Feeling safe while carrying a gun	54.81	23.98
Being thought of as a skilled hunter	54.61	23.24
Having the same chance as the next person to harvest an animal	54.04	23.51
Teaching someone else the skills of hunting	53.85	23.56
Relaxing and relieving tensions	53.41	21.58
Getting away from civilization	52.69	21.99
Being with hunting companions	52.06	20.83

Table 24. Means and standard deviations for products of value importance and perceived instrumentality for 36 hunting activities (continued).

Hunting Activity	Value Importance*Perceived Instrumentality	
	Mean	Standard Deviation
Bagging naturally wild versus planted game	51.03	25.18
Bringing game home	50.99	25.79
Planning a hunting trip	50.77	22.32
Hunting as a chance for recreation (game is secondary)	50.37	22.14
Getting away from people	49.24	21.49
Having a chance to be alone	48.23	24.95
Killing game	47.42	21.62
Bagging a very large mammal or bird	47.31	21.83
Hunting game at different times of the year	45.83	25.21
Getting a bag limit	45.60	21.25
Having the opportunity to get meat	45.46	22.22
Getting at least a few shots	45.13	21.29
Giving game to others	42.55	21.41

Table 24. Means and standard deviations for products of value importance and perceived instrumentality for 36 hunting activities (continued).

Hunting Activity	Value Importance*Perceived Instrumentality	
	Mean	Standard Deviation
Giving game to less successful hunters	42.52	21.22
The amount of game bagged	42.50	20.18
Seeing very few other hunters while hunting	42.24	22.65
Being free to do what is desired while hunting	41.75	23.39
Being on a highly organized hunt	34.19	25.21
Shooting female game	24.68	19.06
Taking advantage of lax law enforcement sometimes	21.44	20.22
Taking small risks	19.96	19.82
Hunting from roads	18.81	21.21
Target practicing while hunting (plinking)	17.86	19.58
Shooting nongame animals while hunting	14.46	17.74

[1]Means can range from 1 to 81.

Table 25. Means and standard deviations for 14 belief strength scales.

Belief	Mean[1]	Standard Deviation
Game laws and regulations provide for good game management	6.26	1.08
Game laws and regulations protect game	6.14	1.30
Game laws and regulations provide for safer hunting	6.11	1.33
Game laws and regulations preserve wildlife	6.11	1.19
Game laws and regulations provide for conservation	6.09	1.22
Game laws and regulations provide every hunter an equal chance to harvest an animal	5.59	1.73
Game laws and regulations produce more game	5.44	1.69
Game laws and regulations are intelligently thought out	5.03	1.65
Game laws and regulations are not enforced strongly enough	4.61	1.96
Game laws and regulations are difficult to remember	3.51	2.13
Game laws and regulations are not responsive to changes in game populations	3.43	2.07

Table 25. Means and standard deviations for 14 belief strength scales (continued).

Belief	Mean[1]	Standard Deviation
Game laws and regulations are difficult to interpret	3.16	1.95
There are too many game laws and regulations	2.84	1.82
Game laws and regulations too restrictive	2.76	1.75

[1]Means can range from 1 (extremely false) to 7 (extremely true).

Table 26. Means and standard deviations for 14 attribute evaluation scales.[1]

Attribute	Mean[1]	Deviation
Protect game	6.06	1.21
Preservation of wildlife	6.05	1.18
Provide for safer hunting	5.97	1.23
Provide for conservation	5.95	1.21
Provide for good game management	5.86	1.31
Produce more game	5.77	1.36
Provide every hunter an equal chance to harvest an animal	5.62	1.49
Intelligently thought out	5.17	1.65
Not enforced strongly enough	3.93	1.99
Too many	3.82	1.81
Not responsive to changes in game populations	3.82	2.00
Too restrictive	3.80	1.86
Difficult to remember	3.67	1.87
Difficult to interpret	3.62	1.91

[1]Means can range from 1 (extremely bad) to 7 (extremely good).

Table 27. Means and standard deviations for 14 products of belief strength and attribute evaluation.

Attribute	Belief Strength*Attribute Evaluation	
	Mean[1]	Standard Deviation
Protect game	38.08	12.00
Preservation of wildlife	37.70	11.73
Provide for good game management	37.38	11.88
Provide for safer hunting	37.35	12.24
Provide for conservation	37.07	11.96
Provide every hunter an equal chance to harvest an animal	33.05	14.72
Produce more game	32.45	14.03
Intelligently thought out	27.62	14.38
Not enforced strongly enough	18.28	13.51
Not responsive to changes in game populations	14.02	12.70
Difficult to remember	13.63	11.92
Difficult to interpret	12.35	11.40
Too many	11.02	9.71
Too restrictive	10.94	9.84

[1]Means can range from 1 (extremely false*extremely bad) to 49 (extremely true*extremely good).

laws and regulations (mean=3.51) and whether game laws and regulations were adequately enforced (mean=4.61). Modal positive beliefs (MPB) were believed to be more true than developed positive beliefs (DVB) (mean of MPB=6.14, mean of DVP=4.17). All five modal positive beliefs were reported to be more true than the three developed positive beliefs. Modal negative beliefs were reported to be less false (mean=3.2) than developed negative beliefs (mean=3.0).

Hunters reported that the attribute "protecting game" was the most favorable (mean=6.06) and the attribute "difficult to interpret" was the least favorable (mean=3.62) of those presented. Hunters were somewhat uncertain about the favorableness of the attributes "not enforced strongly enough" (mean=3.93), "too many" (mean=3.82), "not responsive to changes in game populations" (mean=3.82), and "too restrictive" (mean=3.80). Modal positive attributes were reported to be more favorable (mean=5.98) than developed positive attributes (mean=5.52). All five modal positive attributes were reported to be more favorable than the three developed positive attributes. Developed negative attributes were reported to be more unfavorable (mean=3.70) than modal negative attributes (mean=3.85). Although modal and developed positive attributes tended to be rated in the upper range of favorableness, modal and negative attributes

were in the neutral to slightly unfavorable range.

"Protecting game" had the highest BIAI product (mean=38.08) and "too restricitve" had the lowest product (mean=10.94, Table 26). There were higher mean values for modal products (mean=36.71) than the products of developed characteristics (mean=31.04). The products of BIAI for the attributes "not enforced strongly enough" (mean=18.28) and "not responsive to changes in game populations" (mean=14.02) were equivalent to a rating of neutral toward truthfullness and neutral toward favorableness.

Fishbein's Subjective Attitude Norm

Section G of the final questionnaire requested hunters to indicate their perceptions of the attitudes of each of seven individuals and groups toward game laws and regulations and the hunter's willingness to comply with expectations of each individual or group (the referent). The product of the perceived attitudes of referents and the individual's willingness to comply were summed across referents and divided by the number of products to create a variable labeled REFERENTS. In addition, to provide a measure of a generalized subjective attitude norm toward game laws and regulations, hunters were asked to indicate on a seven-point scale their perceptions of the attitudes of people who were important to them toward game laws and regulations (section G, question 15). Hunters also

reported their willingness to comply with expectations of people who were important to them (section G, question 16). A variable labeled PEOPPROD was created by multiplying perceptions of attitudes by the willingness to comply with the expectations of important people.

Both REFERENTS and PEOPPROD were similarly correlated in a positive direction with attitudes toward game laws and regulations (r=0.30 and 0.27, respectively). However, neither variable accounted for an appreciable amount of variance in attitudes toward game laws and regulations. Perceived attitudes of hunting companions were most highly correlated with game laws' attitudes (r=0.34) and perceived attitudes of churches were least correlated (r=0.13).

Conservation organizations were perceived to have the most favorable attitudes toward game laws and regulations of referents presented (mean=6.28, Table 28). Perceived game law attitudes of respondents' fathers were nearly as favorable as perceived attitudes of conservation organizations (mean=6.24). Previous hunting companions were reported to have favorable attitudes toward game laws on the average, but reported attitudes of previous hunting companions were less favorable than for all other reference individuals and groups.

When the reported willingness to comply with

Table 28. Means and standard deviations for perceptions of attitudes of seven referents toward game laws and regulations.

Referent	Perception of Attitudes	
	Mean[1]	Standard Deviation
Conservation organizations	6.28	1.29
Father	6.24	1.06
Uncle	6.03	1.19
Present hunting companions	5.99	1.19
Church	5.99	1.34
Grandfather	5.79	1.40
Previous hunting companions	5.63	1.40

[1] Means can range from 1 (strongly against) to 7 (strongly in favor).

expectations of referents was considered, conservation organizations would be presumed to have the most influence on attitudes toward game laws and regulations because of a higher attitude x compliance product when compared with all other products (Table 29). However, this assumes that a referent's attitude toward game laws and willingness to comply with expectations of a referent assume equal importance in influencing a person's attitude toward game laws and regulations. This is probably not the case. A hunter's church and grandfather had lowest product means (means=24.34 and 23.39, respectively).

Table 29. Means and standard deviations for seven products of perceived referent attitude and willingness to comply with referent expectation.

Referent	Referent Attitude* Willingness to Comply	
	Mean[1]	Standard Deviation
Conservation organizations	35.82	13.82
Present hunting companions	33.30	15.44
Father	33.08	18.63
Uncle	27.82	20.49
Previous hunting companions	27.10	17.78
Church	24.34	21.75
Grandfather	23.39	22.69

[1]Means can range from 1 to 49.

DISCUSSION

Attitudes

The majority of hunters held favorable attitudes toward game laws and regulations in general (94.7 percent), sportsmanship in hunting (86.1 percent), game law enforcement (96.0 percent), and Virginia game wardens (92.3 percent). Where "favorable" is interpreted as being opposed to game law violations, 51.1 percent of hunters had favorable attitudes (63.8 percent on the category rating scale). Both Haulsee (1973) and Melnyk (1977) have reported similar distributions of attitudes toward game laws among hunters. Haulsee (1973) reported that 80.0 percent of Michigan hunters supported game laws and Melnyk (1977) reported that attitudes of Alberta hunters toward wildlife laws were concentrated in the favorable extreme.

The difference between Haulsee's finding of 80.0 percent support for game laws and the 94.5 percent finding from this research (96.0 percent on the category rating scale) cannot be attributed to a method difference. Haulsee employed a four-point category rating scale (neutral-free) and this research employed a seven-point category rating scale. The difference may be due to different game law structures between Michigan and Virginia, different hunter population structures, different hunting traditions and cultures, or the difference in time

between the two surveys (1972 versus 1979).

An unexpected finding was that appreciably fewer hunters (greater than six percent) favored sportsmanship in hunting than favored game laws and regulations, game law enforcement, and Virginia game wardens. Sportsmanship is commonly reported to be the essence of sport hunting. It may be that the estimate from semantic differential scaling of the percentage of favorable attitudes toward sportsmanship is an underestimate. On the single category rating scale (section C), 96.7 percent of hunters reported being in favor of sportsmanship in hunting. This estimate is supported by a finding of 95.3 percent of hunters reporting "enjoying hunting as a sport" added to hunting satisfaction (questionnaire section D). Because of the conflicting differences between the two methods of scaling, it would be premature to posit reasons for the relatively lower support for sportsmanship in hunting than for support for the game law enforcement complex.

Semantic differential scaling indicated that almost 95 of every 100 hunters held favorable attitudes toward game laws and regulations; the category rating scale estimate was very similar (96.1 percent). These high percentages appear to conflict with an estimate of only 51.1 percent of hunters opposing game law violations (63.8 percent from the category rating scale). It is believed that some of this

percentage difference is due to response-set in the semantic differential scaling (systematic ratings independent of question content). Semantic differential scaling of attitudes toward game laws and regulations was the third of five SD rating tasks. "Game law violations" was the only normally unfavorable stimulus of the five presented. Many respondents tended to rate each scale of every concept at the extreme favorable pole (probably manifesting extremity response-set). Therefore, some respondents disregarded the stimulus "game law violations," interpreted it as a positive stimulus, and rated the stimulus as favorable. The existence of this type of response set is supported by a small but appreciable number of cases where a respondent deleted his or her favorable response and checked a majority of unfavorable (opposed) responses for game law violations. Switching polarity of response also occurred after respondents "noted" that game law violations was a negative concept in the category rating scale task. The difference in percentage points between favorableness toward game laws and opposition to game law violations might have been less if the stimulus "game law violations" had been presented first in the sequence of SD scales and category rating scales.

Correlates of Attitudes

Few background and hunting-related variables were

associated or correlated with most or all attitudes. Important negative correlates of most or all attitudes were self-reported irritating warden contacts in 1977-78; self-reported irritating warden contacts in the past; number of reported irritating warden contacts; receiving a warning or a citation during the period 1973-1978 in Virginia; and, number of warnings and citations received for violation(s) of game laws and regulations from 1973 to 1978. Positive correlates identified were hunting satisfaction in 1977-78 relative to expectations; number of years hunted; and, respondent age.

Hunters did not appear to generalize the apparent influence of reported irritating warden contacts and citations received to attitudes other than game law enforcement and Virginia game wardens. Although Melnyk (1977) reported that the quality of hunter contact with Alberta wildlife officers was positively correlated with attitudes toward wildlife laws ($rho=0.345, P<0.001$), the quality of warden contacts with Virginia hunters was not associated with attitudes toward game laws and regulations. Melnyk's (1977) reported correlation of 0.632 (rho) between quality of contact with wildlife officers and attitudes toward Alberta wildlife officers was substantiated in this study. The number of times a person reported to be irritated by a warden contact was negatively related to

attitudes toward game wardens (r=-0.31). Although only correlational relationships were documented between the number of warnings and citations received by a hunter and the hunter's attitude toward game law enforcement and Virginia game wardens (r=-0.31 and -0.46, respectively), the relationships are likely to be causal. Although two of the three well-known requirements for inferring the presence of causal relationships were met (correlation and time-ordering of variables), it was not possible to meet the requirement of adequately eliminating alternate explanations.

An issue often debated in wildlife law enforcement discussions is whether a written or verbal warning or a citation (with accompanying fine) should be issued for commission of a game law violation. The decision to issue a warning or a citation varies with the perceived gravity of the offense, the age of the violator, the past violation record of the violator, the inclination of the officer, and other factors. It has been suggested that issuing a warning instead of a citation will result in less unfavorable attitudes (or more favorable attitudes) becoming developed in an offender. Contrary to this expectation, the reverse relationship was noted for two of the three attitudes investigated. Of those persons issued a warning between 1973 and 1978, 72.7 percent had LAWSD

scores in the 29-35 range. Of those persons issued a citation between 1973 and 1978, 91.7 percent had LAWSD scores in the 29-35 range. Three-fourths of people issued a warning between 1973 and 1978 had ENFORCESD scores in the 29-35 range in contrast to 87 percent of people receiving a citation. A reverse trend occurred for attitudes toward Virginia game wardens. The ability of warnings to produce less unfavorable (or more favorable) attitudes toward game laws and regulations and game law enforcement than citations is not supported by the above findings.

Comparison of Models

The ability of three models to predict attitudes of Virginia hunters toward game laws and regulations was compared. The three models were Fishbein's beliefs-based model of attitudes (MODPROD), Rosenberg's values-based model (SUMVIPI), and a modification of Fishbein's subjective behavioral norm (REFERENT).

Simple correlations between the three models and attitudes toward game laws and regulations were statistically significant but small in magnitude. SUMVIPI was correlated with LAWSD at 0.12 but explained only one percent of the variance in LAWSD. MODPROD and REFERENTS were correlated with LAWSD (r=0.29 and 0.30, respectively), but accounted for only nine percent of the variance in LAWSD.

When LAWSD was regressed on SUMVIPI, MODPROD, REFERENTS, and all interaction terms, MODPROD, REFERENTS, and MODPROD*REFERENTS were retained in the model. The relatively similar β coefficients for MODPROD (β=0.73) and REFERENTS (β=0.84) and the results of partial correlation tests indicate they are not substantially different in importance. The interaction term, MODPROD*REFERENTS, had a higher simple correlation with LAWSD (r=0.35) than MODPROD (r=0.29) and REFERENTS (r=0.30) and had a larger β statistic, although it was negative. Fishbein's beliefs-based model and subjective norm concept may have both an additive and multiplicative influence on attitudes toward game laws and regulations. The combination of variables could not be considered predictive of attitudes toward game laws and regulations because only 16 percent of the variance about the mean of LAWSD was common to the combination.

The desirability of attempting to delineate factors influencing attitudes of Virginia hunters toward game laws might be qustioned based on the fact that over 90 percent of Virginia hunters appear to have favorable attitudes toward game laws. The comparison of models was not intended to be directly applicable to law enforcement activities but was a basic science investigation. In addition, the percentage of hunters holding favorable

attitudes was much higher than expected prior to the research. It would also seem as important to try to discover factors causing favorable attitudes as compared with factors causing unfavorable attitudes.

The three-variable model of attitudes did not explain appreciable amounts of variance of attitudes toward game laws and regulations. This does not mean the variables are not agents for influencing attitudes. The methods of attitude scaling employed, the semantic differential procedure and a category rating scale, resulted in attitudes being concentrated at the favorable extreme. The small variance of LAWSD and its non-normal distribution may have attenuated correlations between SUMVIPI, MODPROD, REFERENTS and LAWSD. However, it is questionable whether alternate methods of attitude scaling would have increased the variance of attitudes and perhaps normalized the distribution. Melnyk (1977) used 20 Likert statements in each of his attitude scales for wildlife laws and wildlife officers and obtained attitude scores concentrated at the favorable extreme. An investigation of different methods of scaling attitudes toward game laws and other stimuli studied here would, however, increase confidence that attitudes were being measured not only reliably but validly.

Rosenberg's Model

Rosenberg (1967) hypothesized that a person's attitude toward some object is a function of values relevant to the object and the effect of the object on attainment of personal values. Rosenberg's formulation was not supported in this research. Explanations for the nonsignificance of Rosenberg's model in predicting attitudes toward game laws and regulations could be the presence of irrelevant hunting activities in rating tasks, restriction in possible ratings of hunting satisfactions, inconsistent responses on perceived instrumentality rating tasks, and respondent confusion.

An attempt was made during the pretest stage to produce a set of hunting activities which were relevant to attitudes toward game laws and regulations. To achieve this objective, two independent tasks were presented to respondents:

1. A pretest hunting satisfaction item was included in the final questionnaire if less than 50 percent of pretest item respondents reported that satisfaction from the activity was not affected by game laws and regulations.

2. Incorporation in the final questionnaire of 15 modal hunting satisfactions reported by pretest respondents to be affected (positively or negatively) by game laws and regulations.

Although it was thought the above two procedures would produce a set of relevant, content-valid items, the possibility remains that the final set of hunting activites

contained items irrelevant to game laws and regulations.

Although each of the 36 hunting activities was rated in importance to the respondent on a nine-point scale, increased differentiation might have produced a higher correlation between LAWSD and SUMVIPI. That is, many respondents rated 10 or more hunting satisfactions as adding extremely to their hunting enjoyment. Increasing the range of scaling might have produced finer differentiation in importance of activities. Responses may have been constrained because of the nine-point scale. Thus, a restriction in range may have partly produced the low correlation.

Respondents made an average of 5.69 inconsistent responses on the perceived instrumentality rating tasks of the final questionnare (section E). An inconsistent response occurred if a person who received no satisfaction or who received dissatisfaction from an activity reported that game laws affected his or her satisfaction. Inconsistent responses were recoded to a neutral value of five and thus should not have affected the integrity of the model. However, a large number of inconsistent responses would indicate confusion or misinterpretation of rating instructions and cast doubt on the validity of response. One-fourth of respondents made seven or more inconsistent responses in section E. It is possible that respondent

confusion contributed to invalid responses and thus the low correlation betwen LAWSD and SUMVIPI. In the space available for comments on the back of the final questionnaire, the only references made to difficulty in answering questions were for section E, the perceived instrumentality rating tasks. Confusion might have been lessened if several examples for completing the section had been provided to respondents.

A different, and perhaps potentially valuable, means for collecting data to study Rosenberg's values-based model might be to solicit five or six most important hunting satisfactions from a respondent and have the respondent rate each of the satisfactions on both importance and perceived instrumentality scales. This would tend to reduce noise from irrelevant or unimportant hunting satisfactions. Although not documented, it is possible that as a result of submitting a set of 36 hunting satisfaction items to respondents on two separate occasions in the final questionnaire, some respondents fell into a response-set mode of answering. This potentiality would be reduced by using a much smaller set of items.

Fishbein's Beliefs-Based Model

Fishbein has hypothesized that a person's attitude toward any object is a function of (1) the strengths of his beliefs about the object, and (2) the evaluative aspect of

those beliefs. Fishbein's hypothesis was supported in this research but only to a small degree. The sum of modal products of belief strength and attribute evaluation (MODPROD) had a simple correlation of 0.29 with attitudes toward game laws and regulations and explained about nine percent of the variance in LAWSD. In addition to the correlation betwen MODPROD and LAWSD, Fishbein's model is supported indirectly by a much lower correlation between the sum of developed BIAI products (DEVPROD) and LAWSD (r=0.15). If Fishbein's model were not a potentially valid model of attitudes, it would have been expected that the correlations between DEVPROD and LAWSD and MODPROD and LAWSD would have been similar. The sum of modal and developed characteristic products attained a correlation with LAWSD intermediate to that between MODPROD and LAWSD and DEVPROD and LAWSD.

Additional support for Fishbein's hypothesis is provided by the results of partial correlation tests. The correlation between LAWSD and MODPROD (r=0.29) was reduced only slightly when DEVPROD was controlled (partial r=0.23), whereas the correlation between LAWSD and DEVPROD (r=0.15) was reduced completely when MODPROD was controlled (partial r=-0.01). Final support for Fishbein's hypothesis is provided by the relative strengths attached to modal positive beliefs and developed positive beliefs. Fishbein

proposed that those beliefs high in a person's belief hierarchy should be perceived to be more true than beliefs lower in the hierarchy. Modal positive beliefs were believed to be more true than developed positive beliefs (means of 6.14 and 4.17, respectively). All five modal positive beliefs were reported to be more true than the three developed positive beliefs.

The relative ability of modal salient beliefs and personal salient beliefs to predict attitudes has been compared in many studies (Kilty 1971, Hackman and Anderson 1969, Kaplan and Fishbein 1969, Smith and Clark 1973, Thomas and Tuck 1975). The general concensus of these studies is that neither formulation, modal versus personal beliefs, is superior in predicting attitudes.

A reason for one of the formulations not being superior over the other in predicting attitudes is that attributes have been assumed to be of equal importance in influencing polarity of attitudes. Two persons may rate both of the attributes "provide for good game management" and "provide every hunter an equal chance to harvest an animal" as being extremely good but the attributes may still differ in their ability to influence attitudes. If coefficients of importance in addition to attribute evaluation were obtained, each of the resultant BIAI products could be weighted by the coefficient of importance

and products then summed. This could be accomplished in a two-step procedure where attributes were first evaluated and later were submitted to respondents as paired comparisons of equal evaluation polarity. A severe drawback of this refinement is that second-stage questionnaires would need to be individualized to supply unique sets of comparisons.

Fishbein's Subjective Attitude Norm

According to Fishbein, a subjective behavioral norm is determined by perceived behavioral expectations of specific individuals or groups and by the person's willingness to comply with these expectations. Behavioral expectations were replaced with perceptions of the attitudes of referents in this research to generate a measure of a subjective attitude norm instead of the traditional subjective behavioral norm.

The sum of products of perceived referent attitude and willingness to comply with referent expectations was slightly correlated with attitudes toward game laws and regulations (r=0.30). The measure of a generalized subjective attitude norm (attitudes toward game laws of people important to a respondent x willingness to comply with expectations of important people) was only slightly less correlated with LAWSD than REFERENTS (r=0.27). Both measures explained less than 10 percent of the variance in

attitudes toward game laws and regulations. Each of the measures of an attitude norm was equally correlated with attitudes toward game laws and regulations when the influence of the other measure was held constant (LAWSD,REFERENTS.PEOPPROD=0.18, LAWSD,PEOPPROD.REFERENTS= 0.18).

When products of perceived referent attitude and willingess to comply are examined, conservation organizations would be expected to most influence hunter attitudes toward game laws and regulations on the average (mean=35.82, Table 29). However, this conclusion assumes that conservation organizations are equally salient to hunters when compared to other referents (e.g., hunting companions, members of immediate family). It also assumes that hunters are aware of the expectations of conservation organizations. The majority of Virginia hunters do not belong to a conservation organization and thus would not be expected to be aware of the expectations of these organizations. Because of the probable untenabilty of the second assumption, conservation organizations probably play a less influential role in indirectly influencing the attitudes of Virginia hunters toward game laws and regulations than do other individuals and groups.

It is often assumed that game laws and regulations pose a hardship on hunters by being too difficult to

remember, too difficult to interpret, too restrictive, and too numerous. Contrary to these commonly held beliefs of the wildlife management community, Virginia hunters reported these beliefs were more false than true. The relative falsity of these beliefs has also been supported by other studies.

Attitudes of hunters toward the game law enforcement complex are important to wildlife management agencies because of the presumably close ties between attitudes and behavior. Hunters with favorable attitudes toward game laws and regulations may engage in fewer undesirable acts than hunters with less favorable attitudes and thus overall benefits are increased and risks and problems are reduced. The results of this research suggest the possibility that attitudes toward game laws and regulations can be made more favorable by modifying perceptions of game laws and regulations. Modifying perceptions refers to changing the mix of attributes associated with game laws and regulations, inducing changes in the affect associated with attributes, and changing the strength of association of attributes with game laws. According to Fishbein's formula, ΣBa, introducing positive attributes into belief hierarchies, increasing the positiveness of attributes (a), and increasing the strength of association of positive attributes with game laws (B) will increase the

favorability of attitudes. For example, the statement "providing every hunter with an equal chance to harvest an animal" had a mean belief strength rating of 5.59 and a mean attribute evaluation rating of 5.62. Designing strategies to increase the favorableness attached to the attribute and increasing the strength of perceptions of the association of the attribute with game laws (say to a mean of 6.00 for both) would presumably increase the favorableness of attitudes toward game laws and regulations.

Based on simple correlations between the product of value importance and perceived instrumentality and attitudes toward game laws, increasing the positive instrumentality of game laws and regulations on relevant hunting satisfactions may increase the favorability of attitudes. For example, the product of value importance and perceived instrumentality for "the amount of game bagged" had a simple correlation of 0.17 with attitudes toward game laws. Because harvest limits will probably become more restrictive in the future, it would not be desirable to try to influence the importance attached to the amount of game harvested. However, trying to increase the perceived positive instrumentality of game laws in affecting the amount of game bagged would presumably increase the favorability of attitudes.

There appears to be a so-called normative influence which affects the attitudes which hunters have toward game laws and regulations. This was supported by the correlation between the sum of products of perceived referent attitudes and willingness to comply with referent expectations. Normative influence is not susceptible to modification by wildlife management agencies except to the extent that agencies are able to influence conservation organizations which can then influence hunter attitudes. Therefore, if an objective was to improve the favorabilty of hunter attitudes toward game laws and regulations, a more direct route would be to educate young hunters. Improving the quality of warden contacts with hunters might also improve attitude favorabilty. However, in light of the fact that approximately 95 of every 100 Virginia hunters have favorable attitudes toward game laws and regulations, the necessity of expending time and money on increasing the favorability of hunter attitudes toward game laws and regulations seems doubtful.

SUMMARY AND CONCLUSIONS

A mail questionnaire survey was employed to measure the attitudes of Virginia resident hunters toward game laws and regulations, sportsmanship in hunting, game law violations, game law enforcement, and Virginia game wardens; to determine background and hunting-related correlates of attitudes; and, to compare the ability of three social psychological models to predict the attitudes of Virginia hunters toward game laws and regulations.

An initial mailing of a 17-page questionnaire and three follow-up reminders to 3,112 Virginia hunters during 1979 yielded a usable return of 1,245 (40.0 percent) questionnaires. Information on a subset of 10 questions from the questionnaire was obtained from randomly-selected nonrespondents. This was compared with information obtained from respondents. Nonresponse bias was found to be negligible.

Attitudes toward game laws and regulations, sportsmanship in hunting, game law enforcement, and Virginia game wardens were generally favorable. Mean attitude scores were in the upper range of possible mean scores for the four attitudes. Attitudes toward game law violations were bimodally distributed. Approximately one-half of the sample was opposed to game law violations, 11 percent were neutral, and 36.6 percent favored game law

violations.

The major research hypothesis was that the sum of products of value importance and perceived instrumentality (SUMVIPI), the sum of modal belief strength and attribute evaluation products (MODPROD), and the sum of products of perceived referent attitudes and willingness to comply were related in an additive manner to attitudes toward game laws and regulations measured by semantic differential scaling (LAWSD). The research hypothesis was not supported by the data. MODPROD and the mean product of referent attitude and willingess to comply (REFERENTS) were retained in a final multiple regression model but a MODPROD*REFERENTS interaction was also a significant variable in the model. The final three-variable model accounted for only 16 percent of the variance in attitudes toward game laws and regulations. SUMVIPI was not a significant variable in the final regression model. MODPROD and REFERERENTS assumed approximately equal importance in the final model based on very similar standardized partial regression coefficients (β=0.73 and 0.84, respectively).

Few background and hunting-related variables were associated or correlated with most or all of the five attitudes. Important negative correlates identified were self-reported irritating warden contacts in 1977-78; self-reported irritating warden contacts in the past; the number

of times a respondent reported being irritated by a warden contact; receiving a warning or a citation for violation of a game law during the period 1973-1978; the number of warnings and citations received for violation(s) of game laws from 1973 to 1978. Positive correlates identified were the amount of hunting satisfaction in 1977-78 relative to expectations; the number of years a respondent had hunted; and, the age of the respondent.

Major explanations hypothesized for the nonsignificance of Rosenberg's values-based model in prediciting attitudes toward game laws and regulations were (1) the presence of irrelevant hunting activities, (2) restriction in possible ratings of hunting satisfactions, (3) inconsistent responses, and (4) respondent confusion. Respondent confusion may have been the most important factor contributing to the nonsignificance of Rosenberg's model. Confusion might have been lessened in the perceived instrumentality rating task if several examples had been provided. Game laws and regulations were reported to be most helpful in allowing hunters the opportunity to observe wildlife and most restrictive in attaining satisfactions derived from shooting nongame (but not protected) animals while hunting. None of the hunting activities was reported by a majority of hunters as being hindered by the presence of game laws and regulations.

Fishbein's beliefs-based model was supported based on a correlation of 0.29 between MODPROD and LAWSD and by a much lower correlation between DEVPROD and LAWSD (r=0.15). Additional support for Fishbein's model was provided by the results of partial correlation tests and by the finding that five modal positive beliefs were reported to be more true than three developed positive beliefs. Hunters reported that the statement "game laws and regulations provide for good game management" was the most true and the statement "there are too many game laws and regulations" was least true.

The possibility of a normative influence on hunter attitudes toward game laws and regulations was supported. The sum of products or perceived referent attitudes and willingness to comply (subjective attitude norm) had a correlation of 0.30 with attitudes toward game laws and regulations. A measure of a generalized subjective attitude norm was correlated to a similar degree (r=0.29) with attitudes toward game laws and regulations.

Two of the three models examined, Fishbein's beliefs-based model and his subjective norm concept, appear to be additive and multiplicative in their influence on attitudes toward game laws and regulations. Rosenberg's model, based on a low correlation with attitudes, does not appear to influence attitudes toward game laws and regulations.

Many previous investigators have reported that modal beliefs are as predictive of attitudes as personal beliefs. It must be concluded that Fishbein's beliefs-based model, unchanged from his original presentation, is capable of explaining only a small part of the variance of attitudes of Virginia hunters toward game laws and regulations. However, this conclusion is tentative, pending a validation study of attitudes toward game laws and regulations. Reformulating Fishbein's model by obtaining importance values for attributes initially valued equally might increase the predictability of Fishbein's model.

There does appear to be a normative influence on attitudes toward game laws and regulations based on a correlation of 0.30 between LAWSD and REFERENTs and a correlation of 0.29 between LAWSD and PEOPPROD. However, these correlations may represent only covarying and not causal relationships. It was not possible in this cross-sectional research to establish a time-ordering for the presumed normative influence and thus the conclusion of the presence of a normative influence on attitudes toward game laws and regulations must remain tentative.

Hunter perceptions of warden contacts as being irritating, the number of perceived irritating contacts with wardens, and receiving a citation for violation of game laws and regulations appear be the only significant

hunting-related factors identified in this study related to unfavorable attitudes among hunters toward game laws and regulations.

LITERATURE CITED

Ajzen, I. 1971. Attitudinal vs. normative messages: an investigation of the differential effects of persuasive communications on behavior. Sociometry 34(2):263-280.

_____, and M. Fishbein. 1969. The prediction of behavioral intentions in a choice situation. J. Exp. Soc. Psych. 5(3):400-416.

_____, and _____. 1970. The prediction of behavior from attitudinal and normative variables. J. Exp. Soc. Psych. 6(4):466-487.

_____, and _____. 1972. Attitudes and normative beliefs as factors influencing behavioral intentions. J. Pers. Soc. Psych. 21(1):1-9.

_____, and _____. 1973. Attitudinal and normative variables as predictors of specific behaviors. J. Pers. Soc. Psych. 27(1):41-57.

Allport, G. W. 1967. Attitudes. Pages 3-13 in M. Fishbein, ed. Readings in attitude theory and measurement. Wiley and Sons, New York, N.Y.

Amidon, P. H. 1968. New York deer hunters: a comparison of deer law violators and nonviolators. M.S. Thesis. Syracuse Univ., Syracuse, N.Y. 143pp.

Anderson, L. R., and M. Fishbein. 1965. Prediction of attitude from the number, strength, and evaluative aspect of beliefs about the attitude object: a comparison of summation and congruity theories. J. Pers. Soc. Psych. 2(3):437-443.

Babbie, E. R. 1973. Survey research methods. Wadsworth Pub. Co., Belmont, Ca. 384pp.

Barr, A. J., J. H. Goodnight, J. P. Saul, and J. T. Helwig. 1976. A user's guide to SAS 76. Sparks Press, Raleigh, N.C. 329pp.

Beattie, K. H. 1976. A descriptive assessment of Mississippi game law cooperators. M.S. Thesis. Mississippi State Univ., Starkville, Ms. 96pp.

_____. 1979. Fishbein's beliefs-based model and attitudes toward game laws and regulations. Va. J. Sci. 30(2): (in press)

Bem, D. J. 1970. Beliefs, attitudes, and human affairs. Brooks-Cole Pub. Co., Belmont, Ca. 114pp.

Boyle, R. P. 1970. Path analysis and ordinal data. Amer. J. Soc. 75(4):461-480.

Brinton, J. E. 1961. Deriving an attitude scale from semantic differential data. Pub. Opin. Quart. 25(2):289-295.

Bruvold, W. H. 1972. Attitude-belief and attitude-behavior consistency. J. Soc. Psych. 88(2):241-246.

_____. 1973. Belief and behavior as determinants of attitude. J. Soc. Psych. 90(2):285-289.

_____. 1974. Attitudes toward science and accompanying beliefs. J. Soc. Psych. 94(2):269-274.

Carlson, E. R. 1956. Attitude change through modification of attitude structure. J. Abnorm. Soc. Psych. 52(2):256-261.

Carter, R. F., W. L. Ruggels, and S. H. Chaffee. 1968. The semantic differential in opinion measurement. Pub. Opin. Quart. 32(4):666-674.

Chein, I. 1967. Behavior theory and the behavior of attitudes: some critical comments. Pages 51-57 in M. Fishbein, ed. Readings in attitude theory and measurement. Wiley and Sons, New York, N.Y.

Christie, N., J. Andenaes, and S. Skirbekk. 1965. A study of self-reported crime. Pages 86-116 in J. Christiansen, ed. Scandinavian studies in criminology. Tavistock Pub., London, Eng.

Cliff, N. 1956. The relation of adjective-adjective combinations to their components. Ph.D. Thesis. Princeton Univ., Princeton, N.J. 96pp. (not seen; cited by Osgood et al. 1957:152)

_____. 1959. Adverbs as multipliers. Psych. Rev. 66(1):27-44.

Coleman, J. S. 1961. The adolescent society: the social life of the teenager and its impact on education. Free Press, New York, N.Y. 368pp.

Cook, T. D., and C. A. Insko. 1968. Persistence of attitude change as a function of conclusion reexposure. J. Pers. Soc. Psych. 9(4):322-328.

Cronen, V. E., and R. I. Conville. 1975. Summation theory and the predictive power of subjects' own salient beliefs. J. Soc. Psych. 97(1):47-52.

Darroch, R. K. 1971. The prediction of intention and behavior: a comparison of theoretical models of the attitude-behavior relationship using a photographic release signing situation. Ph.D. Thesis. Univ. Illinois, Champaign, Il. 221pp. (not seen; cited by Ajzen and Fishbein 1973:57)

DeVries, D. L., and I. Ajzen. 1971. The relationship of attitudes and normative beliefs to cheating in college. J. Soc. Psych. 83(2):199-207.

DiVesta, F. J., and J. C. Merwin. 1960. The effects of need-oriented communication on attitude change. J. Abnorm. Soc. Psych. 60(1):80-85.

Doob, L. W. 1967. The behavior of attitudes. Pages 42-50 in M. Fishbein, ed. Readings in attitude theory and measurement. Wiley and Sons, New York, N.Y.

Droba, D. D. 1933. The nature of attitude. J. Soc. Psych. 4(4):444-463.

Fishbein, M. 1963. An investigation of the relationships between beliefs about an object and the attitude toward the object. Hum. Rel. 16(3):233-239.

_____. 1965a. A consideration of beliefs, attitudes, and their relationships. Pages 107-120 in I. D. Steiner and M. Fishbein, eds. Current studies in social psychology. Holt, Rinehart, and Winston, New York, N.Y.

_____. 1965b. Prediction of interpersonal preferences and group member satisfaction from estimated attitudes. J. Pers. Soc. Psych. 1(6):663-667.

_____. 1966. Beliefs, attitudes, and behavior. Pages 199-223 in S. Feldman, ed. Cognitive consistency: motivational antecedents and behavioral consequents. Academic Press, New York, N.Y.

_____. 1967a. A consideration of beliefs and their role in attitude measurement. Pages 257-266 in M. Fishbein, ed. Readings in attitude theory and measurement. Wiley and Sons, New York, N. Y.

_____. 1967b. A behavior theory approach to the relations between beliefs about an object and the attitude toward the object. Pages 389-400 in M. Fishbein, ed. Readings in attitude theory and measurement. Wiley and Sons, New York, N.Y.

_____. 1967c. Attitude and the prediction of behavior. Pages 477-492 in M. Fishbein, ed. Readings in attitude theory and measurement. Wiley and Sons, New York, N.Y.

_____. 1967c. A consideration of beliefs and their role in attitude measurement. Pages 257-266 in M. Fishbein, ed. Readings in attitude theory and measurement. Wiley and Sons, New York, N.Y.

_____, and S. Feldman. 1963. Social psychological studies in voting behavior: I. Theoretical and methodological considerations. Amer. Psych. 18(7):388. (Abstract)

_____, and R. Hunter. 1964. Summation versus balance in attitude organization and change. J. Abnorm. Soc. Psych. 69(5):505-510.

_____, and B. H. Raven. 1967. The AB scales: an operational definition of belief and attitude. Pages 183-189 in M. Fishbein, ed. Readings in attitude theory and measurement. Wiley and Sons, New York, N.Y.

_____, and I. Ajzen. 1972. Attitudes and opinions. Ann. Rev. Psych. 23:487-544.

_____, and _____. 1975. Belief, attitude, intention and behavior. Addison-Wesley Pub. Co., Reading, Ma. 578pp.

_____, and F. S. Coombs. 1974. Basis for decision: an attitudinal analysis of voting behavior. J. Appl. Soc. Psych. 4(4):95-124.

French, V. V. 1947. The structure of sentiments. I. A restatement of the theory of sentiments. J. Pers. 15:247-282.

Gibault, J. P. 1970. A wildlife law enforcement study on Kootenay Lake in 1969. Proc. Western Assoc. Fish and Wildlife Agencies 50:541-553.

Hackman, J. R., and L. R. Anderson. 1968. The strength, relevance, and source of beliefs about an object in Fishbein's attitude theory. J. Soc. Psych. 76(1):55-67.

Hampton, E. L., and R. T. Lackey. 1975. Analysis of angler preferences and fisheries management objectives with implications for management. Proc. Southeastern Assoc. Fish and Wildlife Agencies 29:310-316.

Haulsee, H. 1973. Factors affecting deer hunting participation in Michigan. M.S. Thesis. Virginia Polytechnic Institute and State Univ., Blacksburg, Va. 77pp.

Heberlein, T. A. 1973. Social psychologcial assumptions of user attitude surveys: the case of the Wildernism Scale. J. Leisure Res. 5(3):18-33.

Heider, F. 1946. Attitudes and cognitive organization. J. Psych. 21(1):107-112.

_____. 1958. The psychology of interpersonal relations. Wiley and Sons, New York, N.Y. 322pp.

Heise, D. R. 1970. The semantic differential and attitude research. Pages 236-253 in G. F. Summers, ed. Attitude measurement. Rand McNally, Chicago, Il.

Hendee, J. C. 1974. A multiple-satisfaction approach to game management. Wildl. Soc. Bull. 2(3):104-113.

_____, and D. R. Potter. 1971. Human behavior and wildlife management. Trans. N. Am. Wildl. Nat. Res. Conf. 36:383-396.

Hollem, C. C. 1972. Value change, perceived instrumentality, and attitude change. Ph.D. Thesis. Michigan State Univ., Lansing, Mi. 77pp.

Homant, R. J. 1971. Values, attitudes, and perceived instrumentality. Ph.D. Thesis. Michigan State Univ., Lansing, Mi. 181pp.

Howe, E. S. 1962. Probabilistic adverbial qualifications of adjectives. J. Ver. Learn. and Ver. Behav. 1(4):225-247.

_____. 1966a. Verb tense, negatives and other determinants of the intensity of evaluative meaning. J. Ver. Learn. and Ver. Behav. 5(2):147-155.

_____. 1966b. Associative structure of quantifiers. J. Ver. Learn. and Ver. Behav. 5(2):156-162.

Insko, C. A., R. R. Blake, R. B. Cialdini, and S. A. Mulaik. 1970. Attitude toward birth control and cognitive consistency: theoretical and practical implications of survey data. J. Pers. Soc. Psych. 16(2):228-237.

Jaccard, J. J., and A. R. Davidson. 1972. Toward an understanding of family planning behaviors: an initial investigation. J. Appl. Soc. Psych. 2(3):228-235.

Kaplan, K. J., and M. Fishbein. 1969. The source of beliefs, their saliency, and prediction of attitude. J. Soc. Psych. 78(1):63-74.

Katz, D. 1960. The functional approach to the study of attitudes. Pub. Opin. Quart. 24(2):163-204.

Kerlinger, F. N., and E. J. Pedhazur. 1973. Multiple regression in behavioral research. Holt, Rinehart, and Winston, New York, N.Y. 534pp.

Kesel, J. A. 1974. Some of the characteristics and attitudes of Michigan deer hunting violators. M.S. Thesis. Michigan State Univ., Lansing, Mi. 43pp.

Kilty, K. M. 1971. Some determinants of the strength of relationship between attitudinal affect and cognition. J. Soc. Psych. 83(2):275-287.

Klessig, L. L., and J. B. Hale. 1972. A profile of Wisconsin hunters. Wisconsin Dep. Nat. Res. Tech. Bull. No. 60. 25pp.

Komorita, S. S., and A. R. Bass. 1967. Attitude differentiation and evaluative scales of the semantic differential. J. Pers. Soc. Psych. 6(2):241-244.

Krech, D., R. Crutchfield, and E. Ballachey. 1962. Individual in society. McGraw-Hill, New York, N.Y. 564pp.

Labovitz, S. 1967. Some observations on measurement and statistics. Soc. For. 46(2):151-160.

Lemon, N. 1973. Attitudes and their measurement. B. T. Batsford, London, Eng. 294pp.

Mandler, G. 1967. Verbal learning. Pages 1-50 in T. M. Newcomb, ed. New directions in psychology, Vol. 3. Holt, Rinehart, and Winston, New York, N.Y.

McArdle, J. B. 1972. Positive and negative communications and subsequent attitude and behavior change in alcoholics. Ph.D. Thesis. Univ. Illinois, Champaign, Il. 187pp. (not seen; cited by Ajzen and Fishbein 1973:57)

McCormick, J. B. 1968. A procedure for evaluating the effectiveness of wildlife law enforcement. Proc. Western Assoc. Fish and Wildlife Agencies 48:626-639.

McGuire, W. J. 1969. The nature of attitudes and attitude change. Pages 136-314 in G. Lindzey and E. Aronson, eds. The handbook of social psychology. Vol. 3. Addison-Wesley Pub. Co., Reading, Ma.

Mehling, R. 1959. A simple test for measuring intensity of attitudes. Pub. Opin. Quart. 23(4):566-578.

Melnyk, M. J. 1977. Hunter attitudes toward wildlife law and wildlife officers: an analysis of formational aspects. M.S. Thesis. Univ. Alberta, Alberta, Ca. 134pp.

Miller, G. A. 1956. The magical number seven, plus or minus two: some limits on our capacity for processing information. Psych. Rev. 63(2):81-97.

Milord, J. T., and R. P. Perry. 1976. Salient attitudes: a test of Fishbein's linear model. J. Soc. Psych. 99(2):297-298.

Moeller, G. H., and J. H. Engelken. 1972. What fishermen look for in a fishing experience. J. Wildl. Manage. 36(4):1253-1257.

Morse, W. B. 1976. Wildlife law enforcement 1976. Proc. Western Assoc. Fish and Wildlife Agencies 56:127-145.

Nelson, E. 1939. Attitudes: I. Their nature and development. J. Genet. Psych. 46(2):367-399.

Nie, N. H., C. H. Hull, J. G. Jenkins, K. Steinbrenner, and D. H. Bent. 1975. Statistical package for the social sciences. McGraw-Hill, New York, N.Y. 675pp.

Nunnally, J. C. 1973. Psychometric theory. McGraw-Hill, New York, N.Y. 640pp.

Osgood, C. E., and P. H. Tannenbaum. 1955. The principle of congruity in the prediction of attitude change. Psych. Rev. 62(1):42-55.

_____, G. J. Suci, and P. H. Tannenbaum. 1957. The measurement of meaning. Univ. Illinois Press, Urbana, Il. 346pp.

Oskamp, S. 1977. Attitudes and opinions. Prentice-Hall, Englewood Cliffs, N.J. 466pp.

Peak, H. 1958. Psychological structure and psychological activity. Psych. Rev. 65(6):325-347.

Penner, L. 1971. Interpersonal attraction toward a black person as a function of value importance. Personality 2(2):175-187.

Pinter, R. A. 1933. A comparison of interests, abilities, and attitudes. J. Abnorm. Soc. Psych. 27(3):351-357.

Potter, D. R., J. C. Hendee, and R. N. Clark. 1973. Hunting satisfaction: game, guns, or nature? Trans. N. Am. Wildl. Nat. Res. Conf. 38:220-229.

Rhine, R. J. 1967. A concept-formation approach to attitude acquisition. Pages 382-388 in M. Fishbein, ed. Readings in attitude theory and measurement. Wiley and Sons, New York, N.Y.

Ritter, A. F. 1975. Objectives and performance criteria for state wildlife law enforcement agencies. M.S. Thesis. Virginia Polytechnic Institute and State Univ., Blacksburg, Va. 199pp.

Rokeach, M. 1968. Beliefs, attitudes, and values. Josey-Bass, San Francisco, Ca. 214pp.

_____. 1971. Long-range experimental modification of values, attitudes, and behavior. Amer. Psych. 26(5):453-459.

Rosenberg, M. J. 1953. The experimental investigation of a value theory of attitude structure. Ph.D. Thesis. Univ. Michigan, Ann Arbor, Mi. 240pp. (not seen; cited by Rosenberg 1967:331)

_____. 1960a. An analysis of affective-cognitive consistency. Pages 15-64 in M. J. Rosenberg, C. I. Hovland, W. J. McGuire, R. P. Abelson, and J. W. Brehm. Attitude organization and change, an analysis of consistency among attitude components. Yale Univ. Press, New Haven, Cn.

_____. 1960b. Cognitive reorganization in response to the hypnotic reversal of attitudinal affect. J. Pers. 28(1):39-63.

_____. 1965. Inconsistency arousal and reduction in attitude change. Pages 121-134 in I. D. Steiner and M. Fishbein, eds. Current studies in social psychology. Holt, Rinehart, and Winston, New York, N.Y.

_____. 1967. Cognitive structure and attitudinal affect. Pages 325-331 in M. Fishbein, ed. Readings in attitude theory and measurement. Wiley and Sons, New York, N.Y.

Scheibe, K. E. 1970. Beliefs and values. Holt, Rinehart, and Winston, New York, N.Y. 159pp.

Secord, P. F., and C. W. Backman. 1964. Social psychology. McGraw-Hill, New York, N.Y. 659pp.

Selltiz, C., L. S. Wrightsman, and S. W. Cook. 1976. Research methods in social relations. Holt, Rinehart, and Winston, New York, N.Y. 624pp.

Shafer, E. L., P. H. Amidon, and C. W. Severinghaus. 1972. A comparison of violators and nonviolators of New York's deer-hunting laws. J. Wildl. Manage. 36(3):933-939.

Shaw, M. E., and J. M. Wright. 1967. Scales for the measurement of attitude. McGraw-Hill, New York, N.Y. 604pp.

Short, J. F., Jr., and F. I. Nye. 1958. Extent of unrecorded delinquency, tenative conclusions. J. Crim. Law, Crim., and Pol. Sci. 49(3):296-302.

Siegel, A. E., and S. Siegel. 1957. Reference groups, membership groups and attitude change. J. Abnorm. Soc. Psych. 55(3):360-364.

Smith, A. J., and R. D. Clark, III. 1973. The relationship between attitudes and beliefs. J. Pers. Soc. Psych. 26(3):321-326.

Smith, M. B. 1949. Personal values as determinants of a political attitude. J. Psych. 28(2):477-486.

Smith, R. I., and R. J. Roberts. 1976. The waterfowl hunters' perception of the waterfowl resource. Trans. N. Am. Wildl. Nat. Res. Conf. 41:188-193.

Stoll, G. D. 1975. The attitudes of recreational resource users arrested by Michigan conservation officers. M.S. Thesis. Michigan State Univ., Lansing, Mi. 112pp.

Stork, D. F., and F. Walgenbach. 1973. An evaluation of public compliance with wildlife regulations and the associated influence of law enforcement. Proc. Western Assoc. Fish and Wildlife Agencies 53:81-95.

Thomas, K. 1975. The relationship between attitudes and beliefs: comments on Smith and Clark's classification of belief type and predictive value. J. Pers. Soc. Psych. 32(4):748-751.

_____, and M. Tuck. 1975. An exploratory study of determinant and indicant beliefs in attitude measurement. Eur. J. Soc. Psych. 5(2):167-187.

Thurstone, L. L. 1932. The measurement of social attitudes. J. Abnorm. Soc. Psych. 26(2):249-269.

_____. 1967. The measurement of social attitudes. Pages 14-25 in M. Fishbein, ed. Readings in attitude theory and measurement. Wiley and Sons, New York, N.Y.

Tolley, H., Jr. 1973. Children and war: political socialization to international conflict. Columbia Univ. Press, New York, N.Y. 196pp.

Trager, H. G., and M. R. Yarrow. 1952. They learn what they live: prejudice in young children. Harper and Row, New York, N.Y. 392pp.

Triandis, H. C., and M. Fishbein. 1963. Cognitive interaction in person perception. J. Abnorm. Soc. Psych. 67(5):446-453.

Tull, D. S., and G. A. Albaum. 1973. Survey research: a decisional approach. Intext Educational Pub., New York, N.Y. 244pp.

Vernon, P. E., and G. W. Allport. 1931. A test for personal values. J. Abnorm. Soc. Psych. 36(2):231-248.

Wells, W. D., and G. Smith. 1960. Four semantic rating scales compared. J. Appl. Psych. 44(6):393-397.

Weskel, W., and J. D. Hennes. 1965. Attitude intensity and the semantic differential. J. Pers. Soc. Psych. 2(1):91-94.

Woodruff, A. D. 1942. Personal values and the direction of behavior. Sch. Rev. 50(1):32-42 (not seen; cited by Woodruff and DiVesta 1948:659)

_____, and F. J. DiVesta. 1948. The relationship between values, concepts, and attitudes. Educ. Psych. Meas. 8(4):645-659.

Woodworth, R. S., and H. Scholossberg. 1954. Experimental psychology. Holt, Rinehart, and Winston, New York, N.Y. 948pp.

Zajonc, R. B. 1960. The process of cognitive tuning in communication. J. Abnorm. Soc. Psych. 61(2):159-164.

Zinnes, J. L. 1969. Scaling. Ann. Rev. Psych. 20:447-478.

Appendix A. Section A of pretests 1-3.

*****INSTRUCTIONS--PLEASE READ*****

1. Please answer the questions by circling the number next to your choice, unless instructed otherwise.

2. Please mark only one answer for each question, unless instructed otherwise.

3. If you have never hunted before, please write "HAVE NEVER HUNTED" on top of this page, don't answer the questions, and return the questionnaire.

SECTION A. The following section concerns your early experiences with hunting, your initiation into hunting, the number of times you go hunting, and other hunting-related questions. The purpose of the following questions is to learn more about Virginia hunters, especially your previous hunting experience, your present hunting patterns, and your thoughts on wildlife law enforcement.

Previous Hunting Experience

1. What was your age when you began hunting? _____ (years)

2. Who got you started hunting?

1. UNCLE
2. NEIGHBOR
3. FRIEND
4. FATHER
5. BROTHER
6. BROTHER-IN-LAW
7. SPOUSE
8. OTHER RELATIVE
9. NO ONE, WENT ALONE
10. OTHER

3. How many days each year did you normally hunt in your youth? (PLEASE SKIP IF YOU ARE 18 OR UNDER OR BEGAN HUNTING AFTER YOU WERE 18)

1. 1 - 5
2. 6 - 10
3. 11 - 15
4. 16 - 20
5. 21 - 25
6. 26 - 30
7. 31 - 35
8. 36 OR MORE

4. Have you ever participated in a hunter safety course?

1. YES
2. NO

5. When you were growing up, did your father approve of hunting in general?

1. YES
2. NO
3. DOESN'T APPLY

Present Hunting Experience

6. How many years have you been hunting? _____ (years)

7. How many days each year do you normally hunt?

1. 1 - 5
2. 6 - 10
3. 11 - 15
4. 16 - 20
5. 21 - 25
6. 26 - 30
7. 31 - 35
8. 36 OR MORE

8. Did you hunt in Virginia between July 1, 1977 and June 30, 1978?

   1. YES
   2. NO (please skip to question 12)

9. Which of the following game animals did you hunt between July 1, 1977 and June 30, 1978 in Virginia? (PLEASE CIRCLE ALL THAT APPLY)

   1. DEER
   2. RABBIT
   3. SQUIRREL
   4. TURKEY
   5. QUAIL
   6. GROUSE
   7. BEAR
   8. PHEASANT
   9. DOVE
   10. FOX
   11. DUCKS
   12. GEESE
   13. RACCOON
   14. OPOSSUM
   15. WOODCOCK
   16. OTHER (please list): _____

10. Compared to what I expected, hunting between July 1, 1977 and June 30, 1978 was actually?

    1. MUCH WORSE THAN I EXPECTED
    2. WORSE THAN I EXPECTED
    3. ABOUT THE SAME AS I EXPECTED
    4. BETTER THAN I EXPECTED
    5. MUCH BETTER THAN I EXPECTED

11. Please give a reason for your answer to question 10.

    _____

    _____

12. Do you normally hunt: (please circle only one)

    1. ALONE
    2. WITH YOUR SPOUSE
    3. WITH 1 OTHER PERSON
    4. WITH 2 OR MORE OTHER PERSONS

13. What percentage of your friends would you say are hunters?

    1. 0%
    2. 1% - 25%
    3. 26% - 50%
    4. 51% - 75%
    5. 76% - 100%

14. To how many sportsmen's and conservation organizations do you belong (this would include organizations such as local, state, and national hunt clubs, Virginia Wildlife Federation, National Wildlife Federation, etc.)?

    1. 0
    2. 1
    3. 2
    4. 3
    5. 4
    6. 5
    7. 6
    8. 7 OR MORE

15. To how many outdoor and conservation magazines do you subscribe (such as Virginia Wildlife, Field and Stream, Outdoor Life, Sports Afield, Southern Outdoors, Hunting, National Wildlife, Audubon)?

    1. 0
    2. 1
    3. 2
    4. 3
    5. 4
    6. 5
    7. 6
    8. 7 OR MORE

Wildlife Law Enforcement

16. While hunting between July 1, 1977 and June 30, 1978 were you inspected by a Virginia Game Warden?

    1. YES
    2. NO (please skip to question 18)
    3. DID NOT HUNT LAST YEAR (please skip to question 18)

17. Did the inspection bother or irritate you?

    1. YES
    2. NO

18. Have you been inspected by a Virginia Game Warden between July 1, 1975 and June 30, 1978 while hunting?

    1. YES
    2. NO (please skip to question 20)

19. How many times have you been inspected by a Virginia Game Warden between July 1, 1975 and June 30, 1978 while hunting?

    1. 1
    2. 2
    3. 3
    4. 4
    5. 5
    6. 6
    7. 7
    8. 8 OR MORE

20. Thinking back on all your hunting experiences, can you recall a time when a game warden (in any state) bothered or irritated you in some way while you were hunting?

    1. YES
    2. NO (please skip to question 22)

21. How many contacts with a game warden that bothered or irritated you can you recall?

    1. 1
    2. 2
    3. 3
    4. 4
    5. 5
    6. 6
    7. 7
    8. 8

22. Do you know the name of your local Virginia Game Warden?

    1. YES
    2. NO (please go to question 24)

23. Do you know him personally?

    1. YES
    2. NO

24. Did you receive an oral or written warning, or a citation, for violating a game law or regulation in Virginia between July 1, 1973 and June 30, 1978?

    1. NO (please go to SECTION B)
    2. YES, A WARNING
    3. YES, A CITATION
    4. YES, A WARNING AND A CITATION

25. How many warnings and citations did you receive between July 1, 1973 and June 30, 1978 from a Virginia Game Warden?

_____
(NUMBER)

Appendix B. Section B of pretest 1.

SECTION B. The purpose of this section is to identify the pleasures you get from hunting to which GAME LAWS AND REGULATIONS may add or subtract. There are probably both positive and negative aspects to game laws. We want to find out the hunting pleasures you think are affected by game laws so that we can determine the impact of laws on hunting pleasures.

Please list up to 5 hunting pleasures which GAME LAWS AND REGULATIONS add to or reduce for you. Of course, you don't have to list 5.

1. _____

2. _____

3. _____

4. _____

5. _____

Appendix C. Section B of pretest 2.

SECTION B. ********** INSTRUCTIONS **********

In this section I would like you to express your attitude toward game laws and regulations, game law enforcement, game law violations, Virginia Game Wardens, and sportsmanship. On the following pages you will find a set of scales beneath each of the five subjects.

If you feel that the concept (such as game law enforcement) is VERY CLOSELY RELATED to one end of the scale, such as "Good", place an X as follows:

Good __X__:_____:_____:_____:_____:_____:_____ Bad

If you feel the concept is QUITE CLOSELY RELATED to one end of the scale, such as "Bad", place an X as follows:

Good _____:_____:_____:_____:_____:__X__:_____ Bad

If the concept seems ONLY SLIGHTLY RELATED to one side as opposed to the other, then you should place an X as follows:

Good _____:_____:__X__:_____:_____:_____:_____ Bad

If you consider the concept to be NEUTRAL on the scale, then you should place your X in the middle space:

Good _____:_____:_____:__X__:_____:_____:_____ Bad

For example, if you were asked about interstate highways and you thought that in general they were pretty good and extremely helpful, you would mark your answers like this:

Good ___:_X_:___:___:___:___:___ Bad

Helpful _X_:___:___:___:___:___:___ Harmful

GAME LAWS AND REGULATIONS IN GENERAL

1.	Displeasing	___:	___:	___:	___:	___:	___:	___ Pleasing
2.	Helpful	___:	___:	___:	___:	___:	___:	___ Harmful
3.	Bad	___:	___:	___:	___:	___:	___:	___ Good
4.	Desirable	___:	___:	___:	___:	___:	___:	___ Undesirable
5.	Unsatisfactory	___:	___:	___:	___:	___:	___:	___ Satisfactory
6.	Justifiable	___:	___:	___:	___:	___:	___:	___ Unjustifiable
7.	Unacceptable	___:	___:	___:	___:	___:	___:	___ Acceptable
8.	Necessary	___:	___:	___:	___:	___:	___:	___ Unnecessary
9.	Useless	___:	___:	___:	___:	___:	___:	___ Useful
10.	Effective	___:	___:	___:	___:	___:	___:	___ Ineffective
11.	Fair	___:	___:	___:	___:	___:	___:	___ Unfair
12.	Unimportant	___:	___:	___:	___:	___:	___:	___ Important
13.	Approve	___:	___:	___:	___:	___:	___:	___ Disapprove
14.	Worthless	___:	___:	___:	___:	___:	___:	___ Valuable

SPORTSMANSHIP

1.	Desirable	___:	___:	___:	___:	___:	___:	___ Undesirable
2.	Disapprove	___:	___:	___:	___:	___:	___:	___ Approve
3.	Acceptable	___:	___:	___:	___:	___:	___:	___ Unacceptable
4.	Unnecessary	___:	___:	___:	___:	___:	___:	___ Necessary
5.	Unjustifiable	___:	___:	___:	___:	___:	___:	___ Justifiable
6.	Important	___:	___:	___:	___:	___:	___:	___ Unimportant
7.	Useful	___:	___:	___:	___:	___:	___:	___ Useless
8.	Helpful	___:	___:	___:	___:	___:	___:	___ Harmful
9.	Pleasing	___:	___:	___:	___:	___:	___:	___ Displeasing
10.	Worthless	___:	___:	___:	___:	___:	___:	___ Valuable
11.	Bad	___:	___:	___:	___:	___:	___:	___ Good

GAME LAW VIOLATIONS

1.	Undesirable	____:	____:	____:	____:	____:	____:	____ Desirable
2.	Unacceptable	____:	____:	____:	____:	____:	____:	____ Acceptable
3.	Unsatisfactory	____:	____:	____:	____:	____:	____:	____ Satisfactory
4.	Tolerable	____:	____:	____:	____:	____:	____:	____ Intolerable
5.	Worthless	____:	____:	____:	____:	____:	____:	____ Valuable
6.	Fair	____:	____:	____:	____:	____:	____:	____ Unfair
7.	Justifiable	____:	____:	____:	____:	____:	____:	____ Unjustifiable
8.	Necessary	____:	____:	____:	____:	____:	____:	____ Unnecessary
9.	Bad	____:	____:	____:	____:	____:	____:	____ Good
10.	Disapprove	____:	____:	____:	____:	____:	____:	____ Approve
11.	Harmful	____:	____:	____:	____:	____:	____:	____ Helpful
12.	Honest	____:	____:	____:	____:	____:	____:	____ Dishonest
13.	Pleasing	____:	____:	____:	____:	____:	____:	____ Displeasing

GAME LAW ENFORCEMENT

1.	Fair	____:	____:	____:	____:	____:	____:	____ Unfair
2.	Unjustifiable	____:	____:	____:	____:	____:	____:	____ Justifiable
3.	Displeasing	____:	____:	____:	____:	____:	____:	____ Pleasing
4.	Necessary	____:	____:	____:	____:	____:	____:	____ Unnecessary
5.	Worthless	____:	____:	____:	____:	____:	____:	____ Valuable
6.	Effective	____:	____:	____:	____:	____:	____:	____ Ineffective
7.	Unacceptable	____:	____:	____:	____:	____:	____:	____ Acceptable
8.	Desirable	____:	____:	____:	____:	____:	____:	____ Undesirable
9.	Tolerable	____:	____:	____:	____:	____:	____:	____ Intolerable
10.	Bad	____:	____:	____:	____:	____:	____:	____ Good
11.	Unimportant	____:	____:	____:	____:	____:	____:	____ Important
12.	Helpful	____:	____:	____:	____:	____:	____:	____ Harmful
13.	Disapprove	____:	____:	____:	____:	____:	____:	____ Approve

VIRGINIA GAME WARDENS

1.	Harmful	____:	____:	____:	____:	____:	____:	____:	Helpful
2.	Tolerable	____:	____:	____:	____:	____:	____:	____:	Intolerable
3.	Worthless	____:	____:	____:	____:	____:	____:	____:	Valuable
4.	Honest	____:	____:	____:	____:	____:	____:	____:	Dishonest
5.	Disapprove	____:	____:	____:	____:	____:	____:	____:	Approve
6.	Good	____:	____:	____:	____:	____:	____:	____:	Bad
7.	Desirable	____:	____:	____:	____:	____:	____:	____:	Undesirable
8.	Unsatisfactory	____:	____:	____:	____:	____:	____:	____:	Satisfactory
9.	Displeasing	____:	____:	____:	____:	____:	____:	____:	Pleasing
10.	Important	____:	____:	____:	____:	____:	____:	____:	Unimportant
11.	Ineffective	____:	____:	____:	____:	____:	____:	____:	Effective
12.	Unjustifiable	____:	____:	____:	____:	____:	____:	____:	Justifiable
13.	Useful	____:	____:	____:	____:	____:	____:	____:	Useless
14.	Acceptable	____:	____:	____:	____:	____:	____:	____:	Unacceptable
15.	Fair	____:	____:	____:	____:	____:	____:	____:	Unfair

Thank you! This is all of the questions. If there are any comments you wish to make, please use the blank pages at the end of the questionnaire for that purpose.

Appendix D. Section B of pretest 3.

SECTION B. In this section I would like you to provide a brief list of what YOU think are the characteristics, qualities, or consequences of GAME LAWS AND REGULATIONS.

This is similar to what psychologists call "word association tasks." That is, I would give you a word and you would tell me what the word or words first brought to mind. For example, if I said "Interstate Highways" you might provide the following:

*****EXAMPLE***** INTERSTATE HIGHWAYS *****EXAMPLE*****

1. EFFICIENT
2. LONG
3. VERY EXPENSIVE
4. RESULT IN LOWER FATALITIES PER VEHICLE MILE
5. ALLOW TOO HIGH RATE OF SPEED
6. QUICK

Please write what you think are the characteristics, qualities, or consequences of GAME LAWS AND REGULATIONS. Each item you list can be a single word, several words, or a short phrase. Please only include those words coming quickly and easily to mind. Only complete as many lines as the number of thoughts you have.

CHARACTERISTICS, QUALITIES, OR CONSEQUENCES OF GAME LAWS AND REGULATIONS

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____
12. _____
13. _____

Appendix E. Contents of pretest 4.

*****INSTRUCTIONS--PLEASE READ*****

1. Please answer the questions by circling the number next to your choice, unless instructed otherwise.
2. Please mark only one answer for each question, unless instructed otherwise.
3. If you have never hunted before, please write "HAVE NEVER HUNTED" on top of this page, don't answer the questions, and return the questionnaire.

SECTION A. The purpose of this section is to identify those hunting satisfactions whose attainment are helped, hindered, or not affected by GAME LAWS AND REGULATIONS. We want to find out how you think various hunting pleasures are affected by game laws to determine the impact of laws on hunting pleasures. GAME LAWS AND REGULATIONS may have no effect on many of the hunting satisfactions listed below. I tried to think of all hunting satisfactions that could possibly be affected by game laws and in doing this might have included some statements that do not seem to fit. Your cooperation would be appreciated in helping me identify those items that are helped, hindered, or not affected by game laws.

Please circle one of the three numbers to the right of the hunting satisfaction item to indicate whether attainment of the item is helped, hindered, or not affected by GAME LAWS AND REGULATIONS.

Hunting Satisfaction	Effect of GAME LAWS AND REGULATIONS On Attainment of Item		
1. Hunting by myself	1. HELPS	2. HINDERS	3. NO EFFECT
2. Being thought of as a skilled hunter	1. HELPS	2. HINDERS	3. NO EFFECT
3. Bagging as much game as my hunting companions	1. HELPS	2. HINDERS	3. NO EFFECT
4. Bagging more game than hunters in other parties	1. HELPS	2. HINDERS	3. NO EFFECT
5. Getting away from home	1. HELPS	2. HINDERS	3. NO EFFECT
6. Seeing game fall as I shoot	1. HELPS	2. HINDERS	3. NO EFFECT
7. Getting away from rules at home and work	1. HELPS	2. HINDERS	3. NO EFFECT
8. Seeing hunters from other parties	1. HELPS	2. HINDERS	3. NO EFFECT
9. Getting at least a few shots	1. HELPS	2. HINDERS	3. NO EFFECT
10. Being free to do what I want to while hunting	1. HELPS	2. HINDERS	3. NO EFFECT
11. Being on a highly organized hunt	1. HELPS	2. HINDERS	3. NO EFFECT

Hunting Satisfaction	Effect of GAME LAWS AND REGULATIONS On Attainment of Item		
12. Getting away from people	1. HELPS	2. HINDERS	3. NO EFFECT
13. Shooting female game	1. HELPS	2. HINDERS	3. NO EFFECT
14. Seeing very few other hunters while hunting	1. HELPS	2. HINDERS	3. NO EFFECT
15. Relaxing and relieving tensions	1. HELPS	2. HINDERS	3. NO EFFECT
16. Taking small risks	1. HELPS	2. HINDERS	3. NO EFFECT
17. Being close to nature	1. HELPS	2. HINDERS	3. NO EFFECT
18. Talking with hunters in other parties	1. HELPS	2. HINDERS	3. NO EFFECT
19. Showing game I have bagged to family and friends	1. HELPS	2. HINDERS	3. NO EFFECT
20. Giving game to less successful hunters	1. HELPS	2. HINDERS	3. NO EFFECT
21. Giving game to others (friends, neighbors, landowners)	1. HELPS	2. HINDERS	3. NO EFFECT
22. Getting away from civilization	1. HELPS	2. HINDERS	3. NO EFFECT
23. Being with my hunting companions	1. HELPS	2. HINDERS	3. NO EFFECT
24. Feeling safe carrying my gun	1. HELPS	2. HINDERS	3. NO EFFECT
25. Getting away from everyday problems (job, family, etc.)	1. HELPS	2. HINDERS	3. NO EFFECT
26. Bagging game to save money	1. HELPS	2. HINDERS	3. NO EFFECT
27. Shooting my gun	1. HELPS	2. HINDERS	3. NO EFFECT
28. Bringing game home	1. HELPS	2. HINDERS	3. NO EFFECT
29. Displaying game while going home	1. HELPS	2. HINDERS	3. NO EFFECT
30. Shooting non-game animals while hunting	1. HELPS	2. HINDERS	3. NO EFFECT
31. The amount of game bagged	1. HELPS	2. HINDERS	3. NO EFFECT
32. Getting my bag limit	1. HELPS	2. HINDERS	3. NO EFFECT
33. Bagging a very large mammal or bird	1. HELPS	2. HINDERS	3. NO EFFECT
34. Planning a hunting trip	1. HELPS	2. HINDERS	3. NO EFFECT

Hunting Satisfaction	Effect of GAME LAWS AND REGULATIONS On Attainment of Item		
35. Seeing hunters in other parties having success	1. HELPS	2. HINDERS	3. NO EFFECT
36. Stalking game	1. HELPS	2. HINDERS	3. NO EFFECT
37. Having access to free hunting areas	1. HELPS	2. HINDERS	3. NO EFFECT
38. Target practicing while hunting (plinking)	1. HELPS	2. HINDERS	3. NO EFFECT
39. Bagging naturally wild versus planted game	1. HELPS	2. HINDERS	3. NO EFFECT
40. Hunting as a chance for recreation (game is secondary)	1. HELPS	2. HINDERS	3. NO EFFECT
41. Killing game	1. HELPS	2. HINDERS	3. NO EFFECT
42. Dressing out game	1. HELPS	2. HINDERS	3. NO EFFECT
43. Having a drink (beer, whiskey, etc.) after a hunt	1. HELPS	2. HINDERS	3. NO EFFECT
44. Hunting as a way to relieve frustration	1. HELPS	2. HINDERS	3. NO EFFECT
45. Taking advantage of lax law enforcement sometimes	1. HELPS	2. HINDERS	3. NO EFFECT
46. Hunting from roads	1. HELPS	2. HINDERS	3. NO EFFECT
47. Making a difficult shot	1. HELPS	2. HINDERS	3. NO EFFECT
48. Hearing gunfire	1. HELPS	2. HINDERS	3. NO EFFECT
49. Saving hides, horns, or feathers	1. HELPS	2. HINDERS	3. NO EFFECT
50. Teaching someone else the skills of hunting	1. HELPS	2. HINDERS	3. NO EFFECT
51. At least seeing some wildlife	1. HELPS	2. HINDERS	3. NO EFFECT
52. Just being outdoors	1. HELPS	2. HINDERS	3. NO EFFECT

SECTION B. The following questions concern your overall feelings toward each of 5 wildlife law enforcement-related topics and your reasons for your feelings. Place a check-mark (X) above the response most closely related to your overall feelings and in the following question give the most important reason for the way you responded.

An example of how to complete this section is shown at the top of page 4.

EXAMPLE ***EXAMPLE*** ***EXAMPLE***

1a. How would you rate your overall feelings about income tax?

Strongly in favor	Moderately in favor	Slightly in favor	Not in favor or against	Slightly against	Moderately against	Strongly against
	X					

b. What is the most important reason for the way you answered question 1a?

Income taxes seem to be a fair way to pay for governmental services.

1a. How would you rate your overall feelings about game laws and regulations?

Strongly in favor	Moderately in favor	Slightly in favor	Not in favor or against	Slightly against	Moderately against	Strongly against

b. What is the most important reason for the way you answered question 1a?

2a. How would you rate your overall feelings about sportsmanship?

Strongly in favor	Moderately in favor	Slightly in favor	Not in favor or against	Slightly against	Moderately against	Strongly against

b. What is the most important reason for the way you answered question 2a?

3a. How would you rate your overall feelings about game law violations?

Strongly in favor	Moderately in favor	Slightly in favor	Not in favor or against	Slightly against	Moderately against	Strongly against

b. What is the most important reason for the way you answered question 3a?

_____

_____

4a. How would you rate your overall feelings about game law enforcement?

Strongly in favor	Moderately in favor	Slightly in favor	Not in favor or against	Slightly against	Moderately against	Strongly against

b. What is the most important reason for the way you answered question 4a?

_____

_____

5a. How would you rate your overall feelings about Virginia Game Wardens?

Strongly in favor	Moderately in favor	Slightly in favor	Not in favor or against	Slightly against	Moderately against	Strongly against

b. What is the most important reason for the way you answered question 5a?

_____

_____

Thank you! This is all of the questions. If there are any comments you wish to make, please use the blank page at the end of the questionnaire for that purpose.

Appendix F. Final questionnaire mailed to Virginia hunters.

*****INSTRUCTIONS--PLEASE READ*****

1. Please answer the questions by circling the number next to your choice, unless instructed otherwise.

2. Please mark only one answer for each question, unless instructed otherwise.

3. If you have never hunted before, please write "HAVE NEVER HUNTED" on top of this page, don't answer the questions, and return the questionnaire.

SECTION A. The following section concerns your early experiences with hunting, your initiation into hunting, the number of times you go hunting, and other hunting-related questions. The purpose of the following questions is to learn more about Virginia hunters, especially your previous hunting experience, your present hunting patterns, and your thoughts on wildlife law enforcement.

Previous Hunting Experience

1. What was your age when you began hunting? _____ (years)

2. Who got you started hunting?

1. UNCLE
2. NEIGHBOR
3. FRIEND
4. FATHER
5. BROTHER
6. BROTHER-IN-LAW
7. SPOUSE
8. OTHER RELATIVE
9. NO ONE, WENT ALONE
10. OTHER

3. How many days each year did you normally hunt in your youth? (PLEASE SKIP IF YOU ARE 18 OR UNDER OR BEGAN HUNTING AFTER YOU WERE 18)

1. 1 - 5
2. 6 - 10
3. 11 - 15
4. 16 - 20
5. 21 - 25
6. 26 - 30
7. 31 - 35
8. 36 OR MORE

4. Have you ever participated in a hunter safety course?

1. YES
2. NO

5. When you were growing up, did your father approve of hunting in general?

1. YES
2. NO
3. DOESN'T APPLY

Present Hunting Experience

6. How many years have you been hunting? _____ (years)

7. How many days each year do you normally hunt?

1. 1 - 5
2. 6 - 10
3. 11 - 15
4. 16 - 20
5. 21 - 25
6. 26 - 30
7. 31 - 35
8. 36 OR MORE

8. Did you hunt in Virginia between July 1, 1977 and June 30, 1978?

   1. YES
   2. NO (please skip to question 12)

9. Which of the following game animals did you hunt between July 1, 1977 and June 30, 1978 in Virginia? (PLEASE CIRCLE ALL THAT APPLY)

1. DEER	9. DOVE
2. RABBIT	10. FOX
3. SQUIRREL	11. DUCKS
4. TURKEY	12. GEESE
5. QUAIL	13. RACCOON
6. GROUSE	14. OPOSSUM
7. BEAR	15. WOODCOCK
8. PHEASANT	16. OTHER (please list): _____

10. Compared to what I expected, hunting between July 1, 1977 and June 30, 1978 was actually?

    1. MUCH WORSE THAN I EXPECTED
    2. WORSE THAN I EXPECTED
    3. ABOUT THE SAME AS I EXPECTED
    4. BETTER THAN I EXPECTED
    5. MUCH BETTER THAN I EXPECTED

11. Please give a reason for your answer to question 10.

    _____

    _____

12. Do you normally hunt: (please circle only one)

    1. ALONE
    2. WITH YOUR SPOUSE
    3. WITH 1 OTHER PERSON
    4. WITH 2 OR MORE OTHER PERSONS

13. What percentage of your friends would you say are hunters?

1. 0%	4. 51% - 75%
2. 1% - 25%	5. 76% - 100%
3. 26% - 50%	

14. To how many sportsmen's and conservation organizations do you belong (this would include organizations such as local, state, and national hunt clubs, Virginia Wildlife Federation, National Wildlife Federation, etc.)?

1. 0	5. 4
2. 1	6. 5
3. 2	7. 6
4. 3	8. 7 OR MORE

15. To how many outdoor and conservation magazines do you subscribe (such as Virginia Wildlife, Field and Stream, Outdoor Life, Sports Afield, Southern Outdoors, Hunting, National Wildlife, Audubon)?

1. 0	3. 2	5. 4	7. 6
2. 1	4. 3	6. 5	8. 7 OR MORE

Wildlife Law Enforcement

16. While hunting between July 1, 1977 and June 30, 1978 were you inspected by a Virginia Game Warden?

    1. YES
    2. NO (please skip to question 18)
    3. DID NOT HUNT LAST YEAR (please skip to question 18)

17. Did the inspection bother or irritate you?

    1. YES
    2. NO

18. Have you been inspected by a Virginia Game Warden between July 1, 1975 and June 30, 1978 while hunting?

    1. YES
    2. NO (please skip to question 20)

19. How many times have you been inspected by a Virginia Game Warden between July 1, 1975 and June 30, 1978 while hunting?

    1. 1
    2. 2
    3. 3
    4. 4
    5. 5
    6. 6
    7. 7
    8. 8 OR MORE

20. Thinking back on all your hunting experiences, can you recall a time when a game warden (in any state) bothered or irritated you in some way while you were hunting?

    1. YES
    2. NO (please skip to question 22)

21. How many contacts with a game warden that bothered or irritated you can you recall?

    1. 1
    2. 2
    3. 3
    4. 4
    5. 5
    6. 6
    7. 7
    8. 8

22. Do you know the name of your local Virginia Game Warden?

    1. YES
    2. NO (please go to question 24)

23. Do you know him personally?

    1. YES
    2. NO

24. Did you receive an oral or written warning, or a citation, for violating a game law or regulation in Virginia between July 1, 1973 and June 30, 1978?

    1. NO (please go to SECTION B)
    2. YES, A WARNING
    3. YES, A CITATION
    4. YES, A WARNING AND A CITATION

25. How many warnings and citations did you receive between July 1, 1973 and June 30, 1978 from a Virginia Game Warden?

_____
(NUMBER)

SECTION B. ********** INSTRUCTIONS **********

In this section I would like you to express your attitude toward game laws and regulations, game law enforcement, game law violations, Virginia Game Wardens, and sportsmanship. On the following pages you will find a set of scales beneath each of the five subjects.

If you feel that the concept (such as game law enforcement) is VERY CLOSELY RELATED to one end of the scale, such as "Good", place an X as follows:

Good __X__:_____:_____:_____:_____:_____:_____ Bad

If you feel the concept is QUITE CLOSELY RELATED to one end of the scale, such as "Bad", place an X as follows:

Good _____:_____:_____:_____:_____:__X__:_____ Bad

If the concept seems ONLY SLIGHTLY RELATED to one side as opposed to the other, then you should place an X as follows:

Good _____:_____:__X__:_____:_____:_____:_____ Bad

If you consider the concept to be NEUTRAL on the scale, then you should place your X in the middle space:

Good _____:_____:_____:__X__:_____:_____:_____ Bad

For example, if you were asked about interstate highways and you thought that in general they were pretty good and extremely helpful, you would mark your answers like this:

Good _____:__X__:_____:_____:_____:_____:_____ Bad

Helpful __X__:_____:_____:_____:_____:_____:_____ Harmful

GAME LAWS AND REGULATIONS IN GENERAL

1. Good _____:_____:_____:_____:_____:_____:_____ Bad
2. Unjustifiable _____:_____:_____:_____:_____:_____:_____ Justifiable
3. Unimportant _____:_____:_____:_____:_____:_____:_____ Important
4. Approve _____:_____:_____:_____:_____:_____:_____ Disapprove
5. Necessary _____:_____:_____:_____:_____:_____:_____ Unnecessary

SPORTSMANSHIP IN HUNTING

1.	Displeasing	____:	____:	____:	____:	____:	____:	____ Pleasing
2.	Acceptable	____:	____:	____:	____:	____:	____:	____ Unacceptable
3.	Desirable	____:	____:	____:	____:	____:	____:	____ Undesirable
4.	Good	____:	____:	____:	____:	____:	____:	____ Bad
5.	Disapprove	____:	____:	____:	____:	____:	____:	____ Approve

GAME LAW VIOLATIONS

1.	Unjustifiable	____:	____:	____:	____:	____:	____:	____ Justifiable
2.	Honest	____:	____:	____:	____:	____:	____:	____ Dishonest
3.	Satisfactory	____:	____:	____:	____:	____:	____:	____ Unsatisfactory
4.	Disapprove	____:	____:	____:	____:	____:	____:	____ Approve
5.	Necessary	____:	____:	____:	____:	____:	____:	____ Unnecessary

GAME LAW ENFORCEMENT

1.	Harmful	____:	____:	____:	____:	____:	____:	____ Helpful
2.	Justifiable	____:	____:	____:	____:	____:	____:	____ Unjustifiable
3.	Unnecessary	____:	____:	____:	____:	____:	____:	____ Necessary
4.	Valuable	____:	____:	____:	____:	____:	____:	____ Worthless
5.	Approve	____:	____:	____:	____:	____:	____:	____ Disapprove

VIRGINIA GAME WARDENS

1.	Disapprove	____:	____:	____:	____:	____:	____:	____ Approve
2.	Valuable	____:	____:	____:	____:	____:	____:	____ Worthless
3.	Good	____:	____:	____:	____:	____:	____:	____ Bad
4.	Unimportant	____:	____:	____:	____:	____:	____:	____ Important
5.	Justifiable	____:	____:	____:	____:	____:	____:	____ Unjustifiable

SECTION C. Following are 5 questions which conern your overall feelings toward each of the 5 previous subjects. Place a check-mark (X) above the response most closely related to your overall feelings. An example is

EXAMPLE ***EXAMPLE***

1. How would you rate your overall feelings about income tax?

Strongly in favor	Moderately in favor	Slightly in favor	Not in favor or against	Slightly against	Moderately against	Strongly against
		X				

1. How would you rate your overall feelings about game laws and regulations?

Strongly in favor	Moderately in favor	Slightly in favor	Not in favor or against	Slightly against	Moderately against	Strongly against

2. How would you rate your overall feelings about sportsmanship in hunting?

Strongly in favor	Moderately in favor	Slightly in favor	Not in favor or against	Slightly against	Moderately against	Strongly against

3. How would you rate your overall feelings about game law violations?

Strongly in favor	Moderately in favor	Slightly in favor	Not in favor or against	Slightly against	Moderately against	Strongly against

4. How would you rate your overall feelings about game law enforcement?

Strongly in favor	Moderately in favor	Slightly in favor	Not in favor or against	Slightly against	Moderately against	Strongly against

5. How would you rate your overall feelings about Virginia Game Wardens?

Strongly in favor	Moderately in favor	Slightly in favor	Not in favor or against	Slightly against	Moderately against	Strongly against

SECTION D. The purpose of the following questions is to find out the importance of the many aspects of hunting to you.

How much do the following add to or detract from your hunting satisfaction? Please rate each item (by circling) from -4 to +4 as to how it affects your hunting satisfaction. Please answer all items and circle only one response for each item.

	Affect on your hunting SATISFACTION	DETRACTS				Neither adds nor detracts	ADDS			
		Extremely	Highly	Moderately	Somewhat		Somewhat	Moderately	Highly	Extremely
1	The amount of game bagged	-4	-3	-2	-1	0	1	2	3	4
2	Bagging a very large mammal or bird	-4	-3	-2	-1	0	1	2	3	4
3	Seeing very few other hunters while hunting	-4	-3	-2	-1	0	1	2	3	4
4	Shooting nongame animals while hunting	-4	-3	-2	-1	0	1	2	3	4
5	Getting my bag limit	-4	-3	-2	-1	0	1	2	3	4
6	Taking advantage of lax law enforcement sometimes	-4	-3	-2	-1	0	1	2	3	4
7	Feeling safe carrying my gun	-4	-3	-2	-1	0	1	2	3	4
8	Taking small risks	-4	-3	-2	-1	0	1	2	3	4
9	Getting at least a few shots	-4	-3	-2	-1	0	1	2	3	4
10	Having a chance to be alone	-4	-3	-2	-1	0	1	2	3	4
11	Having the same chance as the next person to harvest an animal	-4	-3	-2	-1	0	1	2	3	4
12	Being close to nature	-4	-3	-2	-1	0	1	2	3	4
13	Being thought of as a skilled hunter	-4	-3	-2	-1	0	1	2	3	4
14	Just being outdoors	-4	-3	-2	-1	0	1	2	3	4
15	Having access to free hunting areas	-4	-3	-2	-1	0	1	2	3	4

	Affect on your hunting SATISFACTION	DETRACTS					ADDS			
		Extremely	Highly	Moderately	Somewhat	Neither adds nor detracts	Somewhat	Moderately	Highly	Extremely
16	Getting away from people	-4	-3	-2	-1	0	1	2	3	4
17	At least seeing some wildlife	-4	-3	-2	-1	0	1	2	3	4
18	Hunting as a chance for recreation (game is secondary)	-4	-3	-2	-1	0	1	2	3	4
19	Giving game to others (friends, neighbors, landowners)	-4	-3	-2	-1	0	1	2	3	4
20	Hunting from roads	-4	-3	-2	-1	0	1	2	3	4
21	Hunting game at different times of the year	-4	-3	-2	-1	0	1	2	3	4
22	Teaching someone else the skills of hunting	-4	-3	-2	-1	0	1	2	3	4
23	Enjoying hunting as a sport	-4	-3	-2	-1	0	1	2	3	4
24	Bagging naturally <u>wild</u> versus <u>planted</u> game	-4	-3	-2	-1	0	1	2	3	4
25	Target practicing while hunting (plinking)	-4	-3	-2	-1	0	1	2	3	4
26	Shooting female game	-4	-3	-2	-1	0	1	2	3	4
27	Being on a highly organized hunt	-4	-3	-2	-1	0	1	2	3	4
28	Being free to do what I want to while hunting	-4	-3	-2	-1	0	1	2	3	4
29	Relaxing and relieving tensions	-4	-3	-2	-1	0	1	2	3	4
30	Having the opportunity to get meat	-4	-3	-2	-1	0	1	2	3	4
31	Planning a hunting trip	-4	-3	-2	-1	0	1	2	3	4
32	Giving game to less successful hunters	-4	-3	-2	-1	0	1	2	3	4
33	Getting away from civilization	-4	-3	-2	-1	0	1	2	3	4
34	Being with my hunting companions	-4	-3	-2	-1	0	1	2	3	4
35	Killing game	-4	-3	-2	-1	0	1	2	3	4
36	Bringing game home	-4	-3	-2	-1	0	1	2	3	4

SECTION E. To what degree do GAME LAWS AND REGULATIONS help or hinder the attainment of the following hunting satisfactions? Please rate each item (by circling) from -4 to +4 as to how GAME LAWS AND REGULATIONS help or hinder the attainment of satisfaction you receive from the item. Please answer all items. As an example, if you think game laws and regulations somewhat hinder the attainment of "Hunting by myself," you would circle -1 next to the statement. If you receive no satisfaction, or if you receive dissatisfaction, from an item, circle the number "0" beside the item.

	Effect of GAME LAWS AND REGULATIONS ON..	HINDERS				Neither helps nor hinders	HELPS			
		Extremely	Highly	Moderately	Somewhat		Somewhat	Moderately	Highly	Extremely
1	The amount of game bagged	-4	-3	-2	-1	0	1	2	3	4
2	Bagging a very large mammal or bird	-4	-3	-2	-1	0	1	2	3	4
3	Seeing very few other hunters while hunting	-4	-3	-2	-1	0	1	2	3	4
4	Shooting nongame animals while hunting	-4	-3	-2	-1	0	1	2	3	4
5	Getting my bag limit	-4	-3	-2	-1	0	1	2	3	4
6	Taking advantage of lax law enforcement sometimes	-4	-3	-2	-1	0	1	2	3	4
7	Feeling safe carrying my gun	-4	-3	-2	-1	0	1	2	3	4
8	Taking small risks	-4	-3	-2	-1	0	1	2	3	4
9	Getting at least a few shots	-4	-3	-2	-1	0	1	2	3	4
10	Having a chance to be alone	-4	-3	-2	-1	0	1	2	3	4
11	Having the same chance as the next person to harvest an animal	-4	-3	-2	-1	0	1	2	3	4
12	Being close to nature	-4	-3	-2	-1	0	1	2	3	4
13	Being thought of as a skilled hunter	-4	-3	-2	-1	0	1	2	3	4
14	Just being outdoors	-4	-3	-2	-1	0	1	2	3	4
15	Having access to free hunting areas	-4	-3	-2	-1	0	1	2	3	4
16	Getting away from people	-4	-3	-2	-1	0	1	2	3	4
17	At least seeing some wildlife	-4	-3	-2	-1	0	1	2	3	4

	Effect of GAME LAWS AND REGULATIONS on..	HINDERS					HELPS			
		Extremely	Highly	Moderately	Somewhat	Neither helps nor hinders	Somewhat	Moderately	Highly	Extremely
18	Hunting as a chance for recreation (game is secondary)	-4	-3	-2	-1	0	1	2	3	4
19	Giving game to others (friends, neighbors, landowners)	-4	-3	-2	-1	0	1	2	3	4
20	Hunting from roads	-4	-3	-2	-1	0	1	2	3	4
21	Hunting game at different times of the year	-4	-3	-2	-1	0	1	2	3	4
22	Teaching someone else the skills of hunting	-4	-3	-2	-1	0	1	2	3	4
23	Enjoying hunting as a sport	-4	-3	-2	-1	0	1	2	3	4
24	Bagging naturally wild versus planted game	-4	-3	-2	-1	0	1	2	3	4
25	Target practicing while hunting (plinking)	-4	-3	-2	-1	0	1	2	3	4
26	Shooting female game	-4	-3	-2	-1	0	1	2	3	4
27	Being on a highly organized hunt	-4	-3	-2	-1	0	1	2	3	4
28	Being free to do what I want to while hunting	-4	-3	-2	-1	0	1	2	3	4
29	Relaxing and relieving tensions	-4	-3	-2	-1	0	1	2	3	4
30	Having the opportunity to get meat	-4	-3	-2	-1	0	1	2	3	4
31	Planning a hunting trip	-4	-3	-2	-1	0	1	2	3	4
32	Give game to less successful hunters	-4	-3	-2	-1	0	1	2	3	4
33	Getting away from civilization	-4	-3	-2	-1	0	1	2	3	4
34	Being with my hunting companions	-4	-3	-2	-1	0	1	2	3	4
35	Killing game	-4	-3	-2	-1	0	1	2	3	4
36	Bringing game home	-4	-3	-2	-1	0	1	2	3	4

SECTION F. This section consists of two parts. The purpose of Part I is to obtain your judgements of the degree to which you think characteristics are associated with game laws and regulations. The purpose of Part II is to obtain your evaluation of characteristics that have been associated with game laws and regulations by other persons.

***** PART I *****

Below each of the following sentences you will find a scale. The scale is of the type you completed previously. Place one check-mark (X) on the appropriate blank line of the scale to indicate the degree to which you think the sentence is TRUE or FALSE.

1. GAME LAWS AND REGULATIONS ARE NOT ENFORCED STRONGLY ENOUGH

True _____:_____:_____:_____:_____:_____:_____ False

2. GAME LAWS AND REGULATIONS PROVIDE FOR SAFER HUNTING

True _____:_____:_____:_____:_____:_____:_____ False

3. GAME LAWS AND REGULATIONS GIVE EVERY HUNTER AN EQUAL CHANCE TO HARVEST AN ANIMAL

True _____:_____:_____:_____:_____:_____:_____ False

4. GAME LAWS AND REGULATIONS PROTECT GAME

True _____:_____:_____:_____:_____:_____:_____ False

5. THERE ARE TOO MANY GAME LAWS AND REGULATIONS

True _____:_____:_____:_____:_____:_____:_____ False

6. GAME LAWS AND REGULATIONS PROVIDE FOR CONSERVATION

True _____:_____:_____:_____:_____:_____:_____ False

7. GAME LAWS AND REGULATIONS ARE DIFFICULT TO REMEMBER

True _____:_____:_____:_____:_____:_____:_____ False

8. GAME LAWS AND REGULATIONS RESULT IN MORE GAME

True _____:_____:_____:_____:_____:_____:_____ False

9. GAME LAWS AND REGULATIONS ARE TOO RESTRICTIVE

True _____:_____:_____:_____:_____:_____:_____ False

10. GAME LAWS AND REGULATIONS ARE INTELLIGENTLY THOUGHT OUT

True _____:_____:_____:_____:_____:_____:_____ False

11. GAME LAWS AND REGULATIONS PRESERVE WILDLIFE

True _____:_____:_____:_____:_____:_____:_____ False

12. GAME LAWS AND REGULATIONS ARE NOT RESPONSIVE TO CHANGES IN GAME POPULATIONS

True _____:_____:_____:_____:_____:_____:_____ False

13. GAME LAWS AND REGULATIONS ARE PART OF GOOD GAME MANAGEMENT

True _____:_____:_____:_____:_____:_____:_____ False

14. GAME LAWS AND REGULATIONS ARE DIFFICULT TO INTERPRET

True _____:_____:_____:_____:_____:_____:_____ False

***** PART II *****

As in Part I, below each of the following phrases you will find a scale. In this part the scale is different. Place one check-mark on the appropriate blank line of the scale to indicate the degree to which you think the phrase is GOOD or BAD. Please keep in mind GAME LAWS AND REGULATIONS when evaluating the phrases.

1. NOT ENFORCED STRONGLY ENOUGH

Good _____:_____:_____:_____:_____:_____:_____ Bad

2. PROVIDE FOR SAFER HUNTING

Good _____:_____:_____:_____:_____:_____:_____ Bad

3. PROVIDE EVERY HUNTER AN EQUAL CHANCE TO HARVEST AN ANIMAL

Good _____:_____:_____:_____:_____:_____:_____ Bad

4. PROTECT GAME

Good _____:_____:_____:_____:_____:_____:_____ Bad

5. TOO MANY

Good _____:_____:_____:_____:_____:_____:_____ Bad

6. PROVIDE FOR CONSERVATION

Good _____:_____:_____:_____:_____:_____:_____ Bad

7. DIFFICULT TO REMEMBER

Good _____:_____:_____:_____:_____:_____:_____ Bad

8. PRODUCE MORE GAME

Good _____:_____:_____:_____:_____:_____:_____ Bad

9. TOO RESTRICTIVE

Good _____:_____:_____:_____:_____:_____:_____ Bad

10. INTELLIGENTLY THOUGHT OUT

Good _____:_____:_____:_____:_____:_____:_____ Bad

11. PRESERVATION OF WILDLIFE

Good _____:_____:_____:_____:_____:_____:_____ Bad

12. NOT RESPONSIVE TO CHANGES IN GAME POPULATIONS

Good _____:_____:_____:_____:_____:_____:_____ Bad

13. PROVIDE FOR GOOD GAME MANAGEMENT

Good _____:_____:_____:_____:_____:_____:_____ Bad

14. DIFFICULT TO INTERPRET

Good _____:_____:_____:_____:_____:_____:_____ Bad

SECTION G. The purpose of this section is to identify those persons who you think have influenced your attitude toward GAME LAWS AND REGULATIONS. Please circle only one number below a statement or question. In the event the person mentioned in the statement is deceased, answer the question after rephrasing it in the past tense. An example of this would be: "What do you think WAS the attitude of your father toward...?" and "How much DID you want to do what your father expected you to do?" If the question does not apply to you, circle response number 8.

1. What do you think is the attitude of your FATHER toward game laws and regulations?

1. STRONGLY IN FAVOR
2. MODERATELY IN FAVOR
3. SLIGHTLY IN FAVOR
4. NOT IN FAVOR OR AGAINST
5. SLIGHTLY AGAINST
6. MODERATELY AGAINST
7. STRONGLY AGAINST
8. DOES NOT APPLY

2. How much do you want to do what your FATHER expects you to do?

1. STRONGLY WANT TO
2. MODERATELY WANT TO
3. SLIGHTLY WANT TO
4. DO NOT WANT TO OR NOT WANT TO
5. SLIGHTLY DO NOT WANT TO
6. MODERATELY DO NOT WANT TO
7. STRONGLY DO NOT WANT TO
8. DOES NOT APPLY

3. What do you think is the attitude of your GRANDFATHER toward game laws and regulations? (If you have more than one grandfather, consider them together)

1. STRONGLY IN FAVOR
2. MODERATELY IN FAVOR
3. SLIGHTLY IN FAVOR
4. NOT IN FAVOR OR AGAINST
5. SLIGHTLY AGAINST
6. MODERATELY AGAINST
7. STRONGLY AGAINST
8. DOES NOT APPLY

4. How much do you want to do what your GRANDFATHER expects you to do? (If you have more than one grandfather, consider them together)

1. STRONGLY WANT TO
2. MODERATELY WANT TO
3. SLIGHTLY WANT TO
4. DO NOT WANT TO OR NOT WANT TO
5. SLIGHTLY DO NOT WANT TO
6. MODERATELY DO NOT WANT TO
7. STRONGLY DO NOT WANT TO
8. DOES NOT APPLY

5. What do you think is the attitude of PERSONS YOU HUNT WITH toward game laws and regulations?

1. STRONGLY IN FAVOR
2. MODERATELY IN FAVOR
3. SLIGHTLY IN FAVOR
4. NOT IN FAVOR OR AGAINST
5. SLIGHTLY AGAINST
6. MODERATELY AGAINST
7. STRONGLY AGAINST
8. DOES NOT APPLY

6. How much do you want to do what the PERSONS YOU HUNT WITH expect you to do?

1. STRONGLY WANT TO
2. MODERATELY WANT TO
3. SLIGHTLY WANT TO
4. DO NOT WANT TO OR NOT WANT TO
5. SLIGHTLY DO NOT WANT TO
6. MODERATELY DO NOT WANT TO
7. STRONGLY DO NOT WANT TO
8. DOES NOT APPLY

7. What do you think is the attitude of PERSONS YOU USED TO HUNT WITH toward game laws and regulations?

1. STRONGLY IN FAVOR
2. MODERATELY IN FAVOR
3. SLIGHTLY IN FAVOR
4. NOT IN FAVOR OR AGAINST
5. SLIGHTLY AGAINST
6. MODERATELY AGAINST
7. STRONGLY AGAINST
8. DOES NOT APPLY

8. How much do you want to do what PERSONS YOU USED TO HUNT WITH expect you to do?

1. STRONGLY WANT TO
2. MODERATELY WANT TO
3. SLIGHTLY WANT TO
4. DO NOT WANT TO OR NOT WANT TO
5. SLIGHTLY DO NOT WANT TO
6. MODERATELY DO NOT WANT TO
7. STRONGLY DO NOT WANT TO
8. DOES NOT APPLY

9. What do you think is the attitude of your CHURCH toward game laws and regulations?

1. STRONGLY IN FAVOR
2. MODERATELY IN FAVOR
3. SLIGHTLY IN FAVOR
4. NOT IN FAVOR OR AGAINST
5. SLIGHTLY AGAINST
6. MODERATELY AGAINST
7. STRONGLY AGAINST
8. DOES NOT APPLY

10. How much do you want to do what your CHURCH expects you to do?

1. STRONGLY WANT TO
2. MODERATELY WANT TO
3. SLIGHTLY WANT TO
4. DO NOT WANT TO OR NOT WANT TO
5. SLIGHTLY DO NOT WANT TO
6. MODERATELY DO NOT WANT TO
7. STRONGLY DO NOT WANT TO
8. DOES NOT APPLY

11. What do you think is the attitude of your UNCLE toward game laws and regulations? (If you have more than one uncle, consider them together)

1. STRONGLY IN FAVOR
2. MODERATELY IN FAVOR
3. SLIGHTLY IN FAVOR
4. NOT IN FAVOR OR AGAINST
5. SLIGHTLY AGAINST
6. MODERATELY AGAINST
7. STRONGLY AGAINST
8. DOES NOT APPLY

12. How much do you want to do what your UNCLE expects you to do? (If you have more than one uncle, consider them together)

1. STRONGLY WANT TO
2. MODERATELY WANT TO
3. SLIGHTLY WANT TO
4. DO NOT WANT TO OR NOT WANT TO
5. SLIGHTLY DO NOT WANT TO
6. MODERATELY DO NOT WANT TO
7. STRONGLY DO NOT WANT TO
8. DOES NOT APPLY

13. What do you think is the attitude of CONSERVATION ORGANIZATIONS toward game laws and regulations?

1. STRONGLY IN FAVOR
2. MODERATELY IN FAVOR
3. SLIGHTLY IN FAVOR
4. NOT IN FAVOR OR AGAINST
5. SLIGHTLY AGAINST
6. MODERATELY AGAINST
7. STRONGLY AGAINST

14. How much do you want to do what CONSERVATION ORGANIZATIONS expect you to do?

1. STRONGLY WANT TO
2. MODERATELY WANT TO
3. SLIGHTLY WANT TO
4. DO NOT WANT TO OR NOT WANT TO
5. SLIGHTLY DO NOT WANT TO
6. MODERATELY DO NOT WANT TO
7. STRONGLY DO NOT WANT TO

15. Most of the PEOPLE WHO ARE IMPORTANT TO ME think game laws and regulations are:

1. EXTREMELY NECESSARY
2. QUITE NECESSARY
3. SLIGHTLY NECESSARY
4. NEITHER NECESSARY NOR UNNECESSARY
5. SLIGHTLY UNNECESSARY
6. QUITE UNNECESSARY
7. EXTREMELY UNNECESSARY

16. How much do you want to do what PEOPLE WHO ARE IMPORTANT TO YOU expect you to do?

1. STRONGLY WANT TO
2. MODERATELY WANT TO
3. SLIGHTLY WANT TO
4. DO NOT WANT TO OR NOT WANT TO
5. SLIGHTLY DO NOT WANT TO
6. MODERATELY DO NOT WANT TO
7. STRONGLY DO NOT WANT TO

SECTION H. The following information is needed to compare with other answers and to determine hunter characteristics. All information is confidential and will not be identified with your name.

1. What is your sex?

   1. MALE
   2. FEMALE

2. How old were you on your last birthday? _____ (years)

3. What is the size of the community in which you now live?

   1. RURAL AREA (COUNTRY)
   2. TOWN OF LESS THAN 2,500
   3. TOWN OF 2,500 - 9,999
   4. CITY OF 10,000 - 29,999
   5. CITY OF 30,000 - 49,999
   6. CITY OF 50,000 - 74,999
   7. CITY OF 75,000 - 100,000
   8. CITY OF MORE THAN 100,000

4. What was the size of the community in which you spent most of your youth (before age 18)? PLEASE SKIP IF YOU ARE UNDER AGE 18.

   1. RURAL AREA (COUNTRY)
   2. TOWN OF LESS THAN 2,500
   3. TOWN OF 2,500 - 9,999
   4. CITY OF 10,000 - 29,999
   5. CITY OF 30,000 - 49,999
   6. CITY OF 50,000 - 74,999
   7. CITY OF 75,000 - 100,000
   8. CITY OF MORE THAN 100,000

5. Circle the highest year of school you have completed.

1	2	3	4	ELEMENTARY	13	14	15	16	COLLEGE
5	6	7	8	ELEMENTARY	17	18	19	20	POST-GRADUATE
9	10	11	12	HIGH SCHOOL	21	22	23	24	POST-GRADUATE

6. Please describe the usual occupation of the main wage earner in your household. If retired, describe the usual occupation before retirement.

   TITLE: _____

   KIND OF WORK: _____

   _____

   KIND OF COMPANY OR BUSINESS: _____

   _____

7. Are you the main wage earner in your household?

   1. YES
   2. NO

8. Are you presently: (please circle answer)

   1. WORKING
   2. TEMPORARILY LAID OFF
   3. UNEMPLOYED
   4. RETIRED
   5. FULLTIME HOMEMAKER
   6. FULLTIME STUDENT

9. Taking into consideration all sources of income, what was your total family income before taxes in 1978?

1. LESS THAN $3,000	5. 15,000 TO 19,999
2. 3,000 TO 5,999	6. 20,000 TO 24,999
3. 6,000 TO 9,999	7. 25,000 TO 29,999
4. 10,000 TO 14,999	8. $30,000 OR MORE

10. Were you ever a member of Boy Scouts of America?

1. YES
2. NO

11. Were you ever a member of a local chapter of 4-H Clubs of America?

1. YES
2. NO

Thank you! This is all of the questions. If you have any comments you would like to make, please present them on the back page of this booklet.

The vita has been removed from the scanned document

A SOCIAL PSYCHOLOGICAL INVESTIGATION OF ATTITUDES OF VIRGINIA SPORTSMEN TOWARD GAME LAWS AND REGULATIONS

by

Kirk Harold Beattie

(ABSTRACT)

A mail questionnaire was employed to measure the attitudes of Virginia resident hunters toward game laws and regulations, sportsmanship in hunting, game law violations, game law enforcement, and Virginia game wardens; to determine background and hunting-related correlates of attitudes; and, to compare the ability of three social psychological models to predict the attitudes of Virginia hunters toward game laws and regulations.

An initial mailing of a 17-page questionnaire and three follow-up reminders yielded a usable return of 1,245 (40.0 percent) questionnaires. A comparison of responses of respondents and telephone-interviewed nonrespondents sugggested that nonresponse bias was negligible.

Attitudes toward game laws and regulations, sportsmanship in hunting, game law enforcement, and Virginia game wardens were generally favorable. Mean attitude scores were in the upper range of possible mean scores. Attitudes toward game law violations were bimodally distributed. Approximately one-half of the sample was opposed to game laws violations, 11 percent were

neutral, and 36.6 percent favored game law violations.

Few background and hunting-related variables were associated or correlated with most or all of the five attitudes. Important negative correlates of most or all of the five attitudes were reported irritating 1977-78 warden contacts; reported irritating warden contacts in the past; the number of times a respondent reported having been bothered by a warden contact; receiving a warning or a citation for violation of a game law or regulation during the period 1973-1978; and, the number of warnings and citations received for violation(s) of game laws and regulations from 1973 to 1978.

The three social psychological models tested were Fishbein's beliefs-based model, Rosenberg's value importance-perceived instrumentality model, and a modification of Fishbein's subjective behavioral norm. Population-modal beliefs were employed in Fishbein's beliefs-based model, Rosenberg's model employed hunting activities, and Fisbhein's subjective norm model contained modal referents.

Fishbein's beliefs-based model had a correlation of 0.29 with attitudes toward game laws, Rosenberg's model had a correlation of 0.12 with attitudes, and Fishbein's subjective norm had a correlation of 0.30 with attitudes. The hypothesis that the models were related in an additive

manner to attitudes toward game laws was not supported. Rosenberg's model did not achieve significance in a multiple regression model. Fishbein's two models met a retention criterion in the final model but were also interactive as evidenced by the significance of the interaction term. Fishbein's two models appear to have both additive and multiplicative influences on attitudes toward game laws and regulations. The final model accounted for 16 percent of the variance in attitudes toward game laws and regulations.

Fishbein's beliefs-based model was supported by a superior performance over a model created by investigator-developed beliefs. A modification of Fishbein's model of a subjective behavioral norm and a measure of a generalized subjective attitude norm each accounted for nine percent of the variance in attitudes toward game laws and regulations.

Hunter perceptions of warden contacts as being irritating, the number of perceived irritating contacts with wardens, and receiving a citation for viclation of game laws and regulations appear be the only significant hunting-related factors identified in this study related to unfavorable attitudes among hunters toward game laws and regulations.