Natural Hazard Research

SOME THEORETICAL ASPECTS OF ATTITUDES AND PERCEPTION

by

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PREFACE

This paper is one in a series on research in progress in the field of human adjustments to natural hazards. It is intended that these papers will be used as working documents by the group of scholars directly involved in hazard research as well as inform a larger circle of interested persons. The series is now being supported from funds granted by the U. S. National Science Foundation to the University of Colorado, Clark University and the University of Toronto. Authorship of papers is not necessarily confined to those working at these institutions.

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SOME THEORETICAL ASPECTS OF ATTITUDES AND PERCEPTION*

The increased interest in environment and resource management has brought with it a flood of papers focusing on perception of and attitudes towards the environment. Along with this proliferation of studies has come a proliferation of definitions, implied or explicit, of the terms perception and attitudes, and the confusion that inevitably results from a multiplicity of meanings. It is the purpose of this paper to set out some definitions of these terms, to discuss some theoretical aspects of perceptions and attitudes and to make some brief suggestions about how perceptions and attitudes can be assessed.

Perception

The word perception is used so often that it seems that surely there must be some general agreement on what it means. However, discussions of the word perception range from discussions of the physical aspects of perception--the physical properties of the stimulus such as hue, saturation and brightness; the receptor organs, the eye, with its iris, fovea, lens and retina; and the transmission of impulses from the receptor to the brain--to discussions of inferences made when perceiving other people. In discussing perception of the environment, the interest is not in the neurological and physical aspects of perception, but in what is called social perception. Social perception is concerned with the impression one has of a social stimulus or set of

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stimuli, as that impression is modified by the perceiver's past experience in general, his previous experience with that same or similar stimuli and the individual's state at the moment he is viewing the stimulus of interest. When discussing perception of the environment, it is this type of perception that is of interest. Henceforth in this paper, "perception" shall be used where the more accurate term "social perception" applies.

Since an individual's perception is a function of his past history and his state at the moment he is viewing the stimulus, two individuals with different past experience may look at the same physical stimulus, receive the same image on their retina, have the same image transmitted to the brain and yet perceive that image differently. Thus, Segall, Campbell and Herskovitz[1] found that people living in an environment in which there was a predominance of right angles were more susceptible to the Müller-Lyer Illusion[2] than those living in an environment with few right angles. The authors suggest that the prevalence of rectangularity in the visual environment makes people tend to interpret acute and obtuse angles depicted on a two-dimensional surface as representing acute and obtuse angles in three-dimensional space.

Perception of a stimulus may also be a function of the value of

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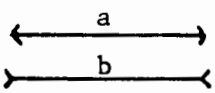
[1]Marshall H. Segall, Donald T. Campbell, and Melville J. Herskovitz, The Influence of Culture on Visual Perception (Indianapolis: Bobbs-Merrill Company, Inc., 1966).

[2]The stimuli for the Müller-Lyer Illusion are thus:



Although the crossbars on figures a and b are of equal length, people in an environment with a predominance of right angles tend to report that line b looks longer.

the object to the individual.[3] After nursery school children were asked to estimate the size of poker chips, the children were given the chips as a reward for co-operating in a simple task. The chips could then be used to purchase candy in a slot machine. After ten days of receiving these chips as a reward, the children were again asked to estimate the size of the chips. While overestimation of the size of the chips was observed throughout the experiment, there was a greater overestimation after the chips had come to serve as a reward. When the reward ceased, the estimation of the size of the chips decreased; it increased again when the chips were reinstated as a reward. A control group, who did not receive the chips as reward, exhibited no significant changes in their estimation of the size of the chips.[4] Perception in this case was a function of previous experience with the stimulus of interest (the poker chip), and the relevant aspect of that previous history was its use as a reward. In the Segall, Campbell and Herskovitz[5] study, perception of the illusion was a function of general past history (the rectangularity of the environment) rather than with the stimulus itself (the representation of the Müller-Lyer Illusion).

A third example of factors influencing perception is that of habituation. Habituation occurs when the repeated presentation of the

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[3]Floyd H. Allport, Theories of Perception and the Concept of Structure (New York: John Wiley and Sons, Inc., 1955), p. 312.

[4]William W. Lambert, Richard L. Solomon and Peter D. Watson, "Reinforcement and Extinction as Factors in Size Estimation," Journal of Experimental Psychology, XXXIX (1949), pp. 637-641.

[5]Segall, Campbell and Herskovitz, The Influence of Culture on Visual Perception.

same stimulus leads to the decrease or disappearance of the response originally made.[6] A common example of habituation occurs when one first enters a room in which people are working. The sounds of typewriters, adding machines and people interacting seems very distracting. After a while, however, the activity is no longer distracting and may not even be noticed. Habituation may then be said to have occurred, and a sudden silence would then seem deafening.[7]

This last example implicitly makes a point which should be made explicit--in order to perceive something, one must first be aware of it. Thus, awareness may be considered one aspect of perception,[8] perhaps the most basic and preliminary aspect, and research into individual differences in the awareness of stimuli is a legitimate and productive research aim. However, since most of the research in perception of the environment focuses on the inferences made after the stimulus has been perceived, it should be conceptually clearer to continue the distinction between perception and awareness.

The maintenance of this distinction is of even greater importance

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[6]Anne M. Treisman, "Selective Attention in Man," British Medical Bulletin, XX (1, 1964), p. 14.

[7]These three examples are by no means a complete listing of factors influencing perception. For a more complete discussion of some of the factors influencing perception see Allport, Theories of Perception and the Concept of Structure, pp. 289-361, and Henri Tajfel, "Social and Cultural Factors in Perception" in The Handbook of Social Psychology, 2nd ed., edited by Gardner Lindzey and Elliot Aronson, III (Reading, Mass.: Addison-Wesley Publishing Company, 1969), pp. 315-394.

[8]Allport states, "How should perception be defined? What are its essential characteristics? As a first approximation let us say that it has something to do with our awareness of the objects or conditions about us." (Theories of Perception and the Concept of Structure, p. 14.)

in discussion of an organized set of stimuli and beliefs related to some aspect of the environment. The term perception should be reserved for those instances in which there is an actual stimulus to be perceived as exemplified by the works of Lynch[9] and Appleyard.[10] When dealing with a situation, a series of processes or collection of beliefs, it would be better to substitute "belief" or "cognition" for "perception." While it is generally agreed that it is difficult, if not impossible, to draw a sharp distinction between perception and cognition, the term cognition is typically taken to refer to aspects of the thought process.[11] The use of the term perception to refer to what is in fact really a series of beliefs about environmental events which are not at the moment present, and which the respondent may himself never have experienced, is erroneous. Perception should be limited to those situations in which there is or was a physical stimulus or set of stimuli present.

Attitudes

The definition of attitude is perhaps even more difficult than the definition of perception. In general usage, the word has come to mean

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[9] Kevin Lynch, The Image of the City (Cambridge: Harvard University Press and M.I.T. Press, 1960). Lynch asked residents of Boston, Los Angeles and Jersey City, New Jersey to describe their city, locate different places in it, map the city and describe how to get from one place in the city to another. On the basis of the data obtained, he was able to map the cities in terms of imageability, "that quality in a physical object which gives it a high probability of evoking a strong image in any given observer," p. 9.

[10] Donald Appleyard, Kevin Lynch and John R. Myer, The View from the Road (Cambridge, Mass.: M.I.T. Press, 1964).

[11] Ulrich Neisser states, "As used here, the term 'cognition' refers to all the processes by which the sensory input is transformed, reduced,

an individual's feelings towards and beliefs about the object of the attitude, or what Campbell terms "the view of the world."[12] However, the only way to measure an individual's view of the world is through his behavior, including verbal behavior. Furthermore, for those interested in environmental quality the concern is not only with what the individual thinks, but also with what he will do. One's attitude toward an object or class of objects will in fact determine how the individual will react to that object when he encounters it. Thus, an attitude must have a behavioral component, or what Campbell calls a "disposition to respond."[13] An attitude then is an organized set of feelings and beliefs which will influence an individual's behavior.

In spite of the multiplicity of definitions of attitude, there is agreement among many psychologists that an attitude has an affective, cognitive and behavioral component.[14] The affective component consists of an individual's feelings of liking and disliking about the object[15]--

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elaborated, stored, recovered, and used. It is concerned with these processes even when they operate in the absence of relevant stimulation, as in images and halluciations. Such terms as sensation, perception, imagery, retention, recall, problem-solving and thinking among many others, refer to hypothetical stages or aspects of cognition." Cognitive Psychology (New York: Appleton-Century-Crofts, 1967), p. 5.

[12] Donald T. Campbell, "Social Attitudes and Other Acquired Behavioral Dispositions," in Psychology: A Study of a Science, ed. by Sigmund Koch, VI (New York: McGraw-Hill Book Company, 1963), p. 96.

[13] Ibid.

[14] David Krech, Richard S. Crutchfield and Egerton L. Ballachey, Individual in Society (New York: McGraw-Hill Book Company, 1962). Roger Brown, Social Psychology (New York: The Free Press, and London: Collier Macmillan Limited, 1965). For a criticism of this position see William J. McGuire, "The Nature of Attitudes and Attitude Change," The Handbook of Social Psychology, 2nd ed., ed. by Gardner Lindzey and Elliot Aronson, III (Reading, Mass.: Addison-Wesley Publishing Company, 1969), p. 155 f.

[15] McGuire, "The Nature of Attitudes, " p. 155.

banning cars from downtown will make the city a more pleasant place to be; modern buildings are cold and impersonal; the sounds of a bustling city are exciting. The cognitive component consists of an individual's beliefs, including his evaluative beliefs, about the object of the attitude[16]--if population control is not undertaken, there will not be enough food to feedthe world's population by the year 2000; those who live in New York City inhale the equivalent of two packs of cigarettes daily; environmental quality is the most important issue facing the world today. It is important to note that the beliefs held by individuals need not in fact be true. What is important is that he believes them to be true.

The individual organizes these affective and cognitive components into a system which predisposes him to respond to the attitude object in a manner consistent with that system. An attitude, then, is the collection of feelings (affects) and beliefs (cognitions) which predispose an individual to react in a certain way to the object of these affects and cognitions.

People tend to keep their affective and cognitive systems internally consistent. The problem of cognitive consistency has received a great deal of attention from psychologists, leading to the development of several theories of cognitive consistency.[17]

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[16] David Krech, Richard S. Crutchfield, and Egerton L. Ballachey, Individual in Society, p. 178.

[17] Robert P. Abelson and Milton J. Rosenberg, "Symbolic Psycho-Logic: A Model of Attitudinal Cognition," Behavioral Science, III (1958), pp. 1-13; Leon Festinger, A Theory of Cognitive Dissonance (New York: Row-Peterson, 1957); Charles E. Osgood and Percy H. Tannenbaum, "The Principle of Congruity in the Prediction of Attitude Change," Psychological Review, LXII (1, 1955), pp. 42-55.

A brief discussion of cognitive consistency or congruity is called for. It seems to be a general aspect of human thought that people expect people they like and respect to have ideas which one also likes and respects and to dislike ideas one also dislikes. Furthermore, one also expects disliked individuals to dislike ideas one likes. In either of these two cases the relationship is balanced. Let us use p as the symbol for the person of interest, o as the symbol of another person, and x as a symbol of a social stimulus, which may be an object or an idea. While it is possible to have a null relationship between these elements, let us focus only on the positive relationships (indicated by a +) and negative relationships (indicated by a -). Figures 1 and 2 are diagrams of a balanced relationship.

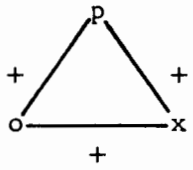

FIGURE 1

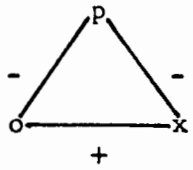

FIGURE 2

Figure 3 is a diagram of an unbalanced relationship.

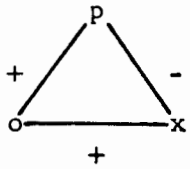

FIGURE 3

The simplest mode of resolving the imbalance is for the relationship between p and x to become positive, yielding the relationship shown in Figure 1.

In cognitive dissonance theory, it is relationships within the individual which are out of balance. The theory deals with unbalanced cognitions the individual holds. For example, an individual may hold the following two cognitions: 1) The water at this beach is badly polluted. 2) Swimming in polluted water is bad for my health. The means of resolving this dissonance are several, the most obvious being to go to another beach. However, the modes of reducing cognitive dissonance suffer the constraints of reality, and the individual may be unable to go to another beach. The mode of resolving dissonance then lies in the individual's changing one of his cognitions to make the situation consonant. The influence of the media may represent a reality factor which prevents his changing his belief in the harmful effects of swimming in polluted water. In that case, the only recourse left the individual is to change his evaluation of the water at the beach by denying that it is as badly polluted as he once thought it was.[18]

Just as sets of affects and cognitions about a given object must be internally consistent, so must the relationship between them be consistent. Intuitively, this may be obvious. Empirically, it is supported by an experiment performed by Rosenberg.[19] Using 22 subjects,

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[18] This is an obviously brief discussion of congruity principles. For a more complete and very readable discussion see Roger Brown, Social Psychology (New York: The Free Press, and London: Collier-Macmillan Limited, 1965), pp. 549-608. An expanded discussion of cognitive dissonance may be found in Festinger, A Theory of Cognitive Dissonance.

[19] Milton J. Rosenberg, "Cognitive Reorganization in Response to the Hypnotic Reversal of Attitudinal Affect," Journal of Personality, XXVIII (1960), pp. 39-63.

Rosenberg first asked them to indicate their interest on seven different social issues by a rank ordering procedure, and at the same time administered a questionnaire designed to obtain the subject's affective responses towards these same seven issues. In a later session, the subject's cognitive structure for one of his two highest interest and one of his two lowest interest attitude areas were elicited both before and after a half hour interval. During this half hour interval, half the subjects (the experimental group) were hypnotized, and given suggestion of affect change for the two areas in which they had been tested. During the same interval the control group was simply instructed to try to fall asleep. The difference in scores between the first and second administration of the Cognitive Structures Test represents the amount of change in the subject's cognitive structure. The experimental group showed a marked change in their scores, while the control group did not. The probability of the differences between the mean change scores for the two groups occurring by chance was less than .01 for the high interest attitude object, and less than .0002 for the low interest attitude object. Thus, when a change is induced in the individual's affective structure toward an attitude object, a change will occur in his cognitive structure to bring the cognitive and affective aspects into a consonant relationship.

Like perceptions, attitudes develop as a result of past experience. Attitudes are learned, and they may be acquired in the same way as anything else is learned--through classical and instrumental conditioning, through concept formation, through observing other people's attitudes and through

being openly taught to hold certain attitudes. A single unpleasant experience with a social object may, through generalization, yield a negative attitude toward all similar social objects, as when an individual who has had an unpleasant experience in a certain large city comes to dislike all large cities, even if he has not been to any others. A person may develop a negative attitude towards detergents by being taught, in school, through the media or by face-to-face contact with others, that they are bad. The congruity principle, typically used to account for attitude change, could also account for attitude formation if p holds no initial attitude towards x, but takes on o's attitude as his own to insure future balance. The means of acquiring attitudes is as varied as the means of learning any other item in the human repertoire.[20]

Perceptions and Attitudes

There may not appear to be much difference between perceptions and attitudes. Both develop as a result of experience. Furthermore, attitudes affect perception,[21] perception affects attitudes,[22] and cognition plays a role in both of them.

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[20] Campbell, in "Acquired Behavioral Dispositions," pp. 107-110, suggests that there are six ways of acquiring attitudes. While this organization of modes of acquisition may be conceptually clearer, it should be recognized that many specific modes may fall into each of his six categories.

[21] as when an individual swimming in polluted water reports the water looks less polluted than it had previously, the change being a result of his reduction of cognitive dissonance.

[22] A consistent perception of a given social stimulus may represent one of the affective or cognitive factors which play a role in attitude formation.

One of the major differences between perception and attitudes is one of scope. The term perception should be used when the stimulus is or has been physically present, meaning that the individual has now or has had in the past a certain perception of this stimulus or set of stimuli. Perceptions are more transitory than attitudes, less stable and more subject to change with the immediate past experience and present state of the perceiver.

Unlike an attitude, a perception may lack an affective (evaluative) component, as when one reports that the smog over Los Angeles looks very heavy on a given day; or it may lack the cognitive component, as when an environment appears threatening to an individual. However, the absence of one of these two components is not a necessary condition for differentiating between a perception and an attitude since a perception can yield both an affective and cognitive response. Perception of a snow storm may yield the emotional reaction that the world looks very quiet and beautiful, and the cognition that it will wreak havoc with the normal functioning of the community.

The behavioral component of perception is unlike the behavioral component of attitudes, due to the difference in the scope of the two concepts. People act and react on the basis of their perceptions, as when a Mid-western farmer flees to his basement when he sees a tornado approaching. This is an example of perception which has an affective component (dislike of tornadoes) and a cognitive component (the tornado may cause great damage). Furthermore, it produces behavior. However, because the farmer is, let us assume, responding to this particular

tornado, rather than tornadoes in general, we would talk about his perception of the tornado.[23] If the farmer decided, after experiencing several tornadoes, to move to a part of the country where tornadoes do not occur, we might infer from his behavior that he had a negative attitude towards tornadoes. Thus, the distinction between perception and attitudes lies not only in the immediacy of the stimulus but also in the generality of the stimulus--the specific stimulus versus a class of stimuli.

Beliefs lie somewhere between attitudes and perceptions. They constitute the cognitive component of attitudes, and so are not as inclusive as attitudes, but because they may deal with a variety of aspects of a stimulus or situation, and because the subject of the belief need not be present for the belief to be held, they are more general than perceptions. When an individual has a series of beliefs about an environmental event or situation and has an affective reaction to that event, then he has an attitude towards that aspect of the environment.

The Study of Attitudes

Because of the importance of the behavioral component of an attitude, it is well to spend some time discussing what the term "behavior" means with respect to an attitude. Most people, in thinking

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[23] Although the farmer is responding to this tornado, it is reasonable to assume that the negative affect generated by this tornado is a result of his experience with previous tornadoes.

about behavior think of some overt, non-verbal act which can be observed by others: buying detergents, signing a petition, writing letters of protest, contributing to a campaign, taking part in a protest march and so on. After observing whether or not an individual engages in these activities, one would probably be willing to make some statement about his attitude towards environmental quality. However, it is clearly not feasible for a researcher to follow individuals around, observing their behavior, in an attempt to make a statement about "the public's" attitude towards the environment. A much easier technique is to simply ask them what their attitudes are. One is then looking at verbal, as opposed to overt, behavior.

Many would argue that asking people about their attitudes to air and water pollution or to population control is an inaccurate means of assessing attitudes. People can say one thing and mean another. It is not at all unrealistic to imagine a housewife who asserts that she will stop using detergents in her family wash but who continues to do so, in spite of what she has said. I would say that the apparent inconsistency of these behaviors may be explained by looking at the degree of commitment involved. The housewife who says she will stop using detergents may be sufficiently concerned about the problem of water pollution to feel that she ought to stop using detergents, but is not in fact concerned enough to sacrifice the "whiteness and brightness" of her family's wash by giving up the use of detergents.[24]

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[24]This concept of degrees of commitment to an attitude is drawn from a discussion of this issue by Campbell, "Acquired Behavioral Dispositions," pp. 159-162.

In discussing attitudes it is extremely important to remember that from the point of view of attitude measurement, an attitude has two important properties: direction and magnitude.[25] Direction refers to whether the feelings, beliefs and behavioral tendencies are positive or negative.[26] Magnitude refers to the "degree" of favorableness or unfavorableness of an attitude.[27] While the importance of the direction of an attitude has been generally recognized, the issue of the strength of an attitude has been somewhat neglected in the research on environmental quality. Clearly, variations in the strength, as well as the magnitude, of an attitude will account for variation in human behavior. To return to the example of the housewife and her detergents, a woman who feels very strongly about the need to improve the quality of the environment might be willing to stop using detergents, while one who is only mildly concerned might feel that efforts at water pollution control should be aimed only at stopping the dumping of effluents by industrial plants and sewage treatment systems.

In the past, too many, though by no means all, researchers have focused only on the direction of an attitude. Questions such as "Is this a good (hard) place to be a farmer? Why?" are all too common.

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[25] In fact Scott puts forth 11 attributes of attitudes, but for the purposes of attitude measurement only direction and magnitude are important. William A. Scott, "Attitude Measurement" in The Handbook of Social Psychology, 2nd ed., ed. by Gardner Lindzey and Elliot Aronson, II (Reading, Mass.: Addison-Wesley Publishing Company, 1969), pp. 206-208.

[26] Ibid., p. 206.

[27] Ibid.

While the response to this question tells us whether the respondent has a positive or negative attitude towards the area he lives in, with respect to farming, and why he feels that way, it does not yield information on how good or bad he thinks the area is. Are there only minor inconveniences, with which the respondent has learned to cope, or are the problems great enough for him to have considered moving into a better area? From the point of view of ameliorating the situation, no information is available on how much change would be necessary to change the respondent's attitude towards the area from negative to positive. If the farmer says it is a bad area to farm and there is no knowledge of how bad he thinks it is, is it reasonable to assume the bad farming in the area is the most important problem he has? Is it not possible that as a farming area it is only slightly bad but other, more pressing, problems make the area a difficult place for him to live--problems like access to supply sources, schools, health facilities and entertainment?

Information about the strength of an attitude can be gained through a single question, such as "Would you say that the water pollution problem is now being tackled 1) effectively, 2) adequately, 3) inadequately?" While questions such as this are an improvement over the simpler "Yes-No" type of question, I believe that even these questions are less than optimal. A preferable procedure would be to administer a number of items about the attitude object of interest, have the respondent react to each of these items, and assign him an attitude score based on his response to this series of statements. A typical scale of this type consists of about 20 statements about the attitude object and between four and seven

response alternatives ranging along a continuum from strongly disagree to strongly agree.[28] This type of scale is known as a Likert scale, and has been widely used in the study of attitudes.[29]

The desirability of this type of scale lies in the fact that a single item for measuring attitudes not only yields insufficient information to be of great value, but also is subject to several sources of error. A single item may be subject to random response error; it may reflect attributes other than the one in which the investigator is interested; and the meaning of the statement may be misinterpreted by the respondent. If only one item is used to measure an attitude, there is too great a probability that it will yield an inaccurate reflection of the subject's score, whereas if several items are used, the effect of some kind of error in responding to one item will have less effect on the accuracy of the total attitude score.

However, the above argument is by no means intended to preclude the use of open-ended questions. For reasons of time, it is typically the case that where an open-ended question is used, only a few questions of this type are administered, whereas the use of an attitude scale results in the administration of a series of questions. Which type is to be used depends on the type of research question to be answered and the

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[28] Although it consists of only five statements, instead of the more usually advocated 20 to 22, the scale developed by Leon Srole for measuring anomie is a good example of a Likert type scale. Leon F. Srole, "Social Integration and Certain Corollaries: An Exploratory Study," American Sociological Review, XXI (1956), pp. 709-716.

[29] For a discussion of the philosophy of this type of scale and the techniques for developing it, see Allen L. Edwards, Techniques of Attitude Scale Construction (New York: Appleton-Century-Crofts, Inc., 1957), pp. 149-171.

situation in which the information is being obtained. In situations where it is difficult to maintain the interest of the respondent through a long series of closed questions, it is better to obtain a little information using open-ended questions than not to obtain any data at all. Should one simply want to assess attitudes towards a planned expressway through the center of a city, the scale type questions might yield the desired information in a form which is easier to analyze. However, if one is interested in <u>why</u> people support or oppose the construction of the expressway, a series of open-ended questions is likely to be more useful.[30] When open-ended questions are used, they should be designed not only to assess the attitude (is the individual for or against construction of the expressway) but also to understand the reasons for that attitude (it will cost too much, it will destroy the neighborhood, it will increase pollution, etc.). This additional information will then enable the decision-makers to perhaps modify their plans in a way that would make them more acceptable to the general public.

Campbell[31] suggests seven possible ways of assessing attitudes. Some are rather farfetched, but many of them are quite worthwhile and practical, and should be put to more use. These seven methods are:

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[30]For a more complete discussion of the advantages and disadvantages of the open and closed questions see Scott, "Attitude Measurement," pp. 210-12.

[31]Campbell, "Acquired Behavioral Dispositions," pp. 149-152.

1. tailing: this involves following a subject around with a tally sheet, noting what behaviors he does and does not engage in. As more is known about the respondent's behavior with respect to the attitude object, the categories for recording relevant behaviors would have to be revised. The procedure is clearly both awkward and costly, thus making it unfeasible, but it may be considered ideal from the point of view of accurately assessing an individual's commitment to an attitude object.

2. episodic recall: requires the individual to recount to the investigator the situations he has been in during a preceding time of stipulated length, and to report his behavior and feelings about these incidents.

3. situation sampling: is a type of field observation in which the investigator discovers what the relevant stimuli are and when and where they will be. He then observes individuals' behavior when the stimuli are both present and absent. Assertions can then be made about the behavior of a population of people with respect to a given stimulus, rather than about the behavior of a given individual with respect to a population of stimuli, as in the two preceding methods.

4. contrived situations: are used when the scheduling of the behavior of the individual is under the control of the investigator. Social stimuli which are examples of the object of the attitude to be assessed may be presented and the respondent's reaction may be observed.

5. symbolic stimulus tests: entail the procedure of presenting the subject with symbolic representations, such as photos, drawings and models, of the attitude object and observing his reactions to them.

6. respondent's report on own response dispositions: entails the subject reporting to the experimenter how he responds when the attitude object is present. Because verbal behavior is a type of behavior, this method is a perfectly acceptable technique for assessing attitudes. The test can use either open-ended questions ("When you see someone dumping litter by the side of the road, what do you do?") or a more structured approach in which the situation is described and the respondent chooses which of several different ways he is most likely to react.

7. respondent's report on his view of the stimulus: assesses an individual's attitude by obtaining his report of the characteristic of the stimulus as he sees it. The ease of this technique

> makes it the most widely used of all attitude assessment techniques. Since the subject's "view of the world" is an important part of the concept of attitude, this constitutes a simple and valid means of measuring attitudes.

Clearly, it is possible to assess attitudes through any one of these seven means, but it is important to remember that it is both possible and desirable to use a combination of these methods. Subjects might be asked to respond to an attitude scale and tell a story about a picture, or choose which of a series of pictures of environmental scenes they find most attractive. Situation sampling could easily be coupled with an interview technique, as for example when an observer in a supermarket notices which brand of washing soap an individual buys and then interviews him about attitudes towards water pollution. The imaginative researcher can come up with a host of new techniques to be used alone or in conjunction with other techniques.[32]

Conclusion

While the importance of knowing public attitudes towards and perception of the environment could be discussed endlessly, it is clear that the value of this knowledge is partly determined by the quality of the data collected. It is hoped that this somewhat abstract discussion of the theoretical aspects of attitudes and perception has helped to put this area into some kind of order, and that this discussion offers some theoretical and practical guidelines for improving the quality of the data.

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[32] An excellent compendium of novel research techniques may be found in Eugene J. Webb, et al., Unobtrusive Measures: Nonreactive Research in the Social Sciences (Chicago: Rand McNally, 1966).