TOWARD A UNIFIED FRAMEWORK OF DECISION-MAKING: THE CASE OF ENVIRONMENTALLY PROTECTIVE BEHAVIOUR

by

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ABSTRACT

Theoretical determinants of decisions regarding one's behaviour are integrated into a comprehensive and inclusive framework. This framework is then employed to determine the factors responsible for guiding decisions regarding the protection of the natural environment. Included in the framework are constructs from four conceptual domains: (a) attitudinal phenomena, (b) efficacy beliefs, (c) functional motivators of behaviour (i.e., outcome beliefs) and (d) personal values. In addition, the role of psychological motivators in the decision process is reviewed. Several advances in theory are suggested. First, attitudes towards objects (e.g., the natural environment) are differentiated from attitudes towards specific behaviours (e.g., recycling), and both concepts are incorporated into the framework. Second, it is recommended that different functional motives be defined and independently assessed. In the present research, three domains of outcomes (i.e., economic, social, and environmental) are specified and their motivational influence explored. Third, it is suggested that personal value orientations be included in a comprehensive study of behavioural decisions. A taxonomy of values specifying three domains (i.e., economic, social, and universal) is proposed and the influence of personal value orientations toward each domain on behavioural decisions is examined. Findings from three experiments suggest that constructs from all four conceptual domains are involved in guiding decisions to perform environmentally protective behaviours. Specifically, beliefs regarding behavioural outcomes and efficacy were the most directly associated with these behavioural decisions. More positive outcome expectations and stronger beliefs of self-efficacy and behavioural accessibility were associated with decisions to perform environmentally protective behaviours. Personal values also accounted for a significant amount of variance in behavioural decisions. In general, economically-oriented subjects were least likely to choose an environmentally protective course of action, whereas universally-oriented subjects were most likely to pursue environmental protection and preservation. As expected, a personal value x outcome belief interaction was found that

showed that the decisions of economically-oriented subjects were consistently influenced by economic considerations, whereas the decisions of subjects in the other two value groups were not. Finally, attitudinal phenomena appear to be least important in guiding behavioural decisions. Theoretical considerations and implications regarding the promotion of environmentally protective behaviour are discussed.

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Introduction

The explanation and prediction of social behaviour has challenged philosophers and social scientists throughout the centuries. Wide variance in how individuals act in response to identical stimuli has often been observed, even when the individuals originate from homogeneous populations. This incongruity can be noticed today in behaviours that have implications for pressing social concerns. Societal problems, such as crime, AIDS and other health problems, discrimination, and environmental destruction have individuals concerned, but people's responses to these dilemmas vary significantly. Even when clear actions are identified that can prevent problems from escalating, many people are reluctant to alter their behaviour accordingly. For example, people continue to smoke cigarettes, engage in unsafe sex, drink alcohol and drive, and abuse the natural environment. As our society grapples with the myriad of social concerns, understanding the factors that guide people's behavioural decisions becomes increasingly important. Although some variance in social issue behaviour can be accounted for by differences in culture, demographics, and personality characteristics, a great deal is still left unclear.

Throughout its history, social psychology has been the science most responsible for developing theories that cogently explain the diversity in social behaviour from an individual, cognitive approach. This thesis continues that tradition. Its broad theoretical objective is to expand our current understanding of the interplay among factors responsible for guiding decisions regarding social behaviour. This theoretical goal will be pursued conjointly with a specific applied concern - to understand more fully what beliefs, desires and values are associated with behavioural decisions regarding an issue of both public and personal concern: the protection and preservation of the natural environment. Modern interaction with the natural environment involves many difficult choices, many of which relate to new patterns of individual behaviour. The choices made and resulting consequences will likely have dramatic implications for the functioning of society. These reasons highlight the need for, and suitability of, psychological investigation of this issue.

In January 1989, Time magazine named "The Endangered Earth" as its person of the year. On its cover, the Earth was graphically represented as a suffocating globe wrapped in plastic and twine. This pronouncement, twenty years after the first Earth Day, seemingly placed the ecological crisis at the forefront of public awareness. Finally, the powerful and lasting effect that human behaviour has on our natural environment, and how this effect can jeopardize human life, was being recognized in mainstream society. Since then, discussions of environmental concerns such as food contamination, air and water pollution, energy production and toxic waste, overexploitation of natural resources, and solid waste disposal have become commonplace in scientific and political circles. The threats posed by environmental abuses have fostered the realization that virtually every action that we, as individuals, perform has some, albeit small, environmental consequence. Taking a shower, watching T.V., driving our cars, heating our homes, throwing out garbage, how we eat, what we eat, all the basic activities that are part of our daily existence have an impact upon the natural environment. Moreover, the collective impact of our way of life is creating many environmental dilemmas with which we must contend.

One might expect that this level of public exposure to ecological crises would have mobilized individuals to address these life-threatening predicaments - but has it? How have individuals in society responded to these challenges? Are we extinguishing behaviours responsible for creating ecological problems and adopting behaviours that will ameliorate these problems, sustaining life well into the future? Although concern over environmental problems has apparently penetrated the mind of virtually every person (over 90% of the public claim to be environmentalists) and certain behavioural changes have been noted (e.g., increased recycling), major behavioural change has not yet been observed (see, Angus Reid Group, 1992; Gallup & Newport, 1990). This apparent discrepancy leads to certain questions. For example, why do some people strongly pursue environmental preservation and protection, and others do not? In addition, why do many people who report supporting

environmental protection and preservation not appear to act in a manner consistent with those attitudes?

I began investigating these questions by attempting to determine the relevant social psychological theory which could provide the foundation from which the phenomena of interest could be studied and explained. This review identified numerous psychological theories, primarily from the social psychological literature, that purported to explain variance in social behaviour. At the same time, I found no single theory, or general framework, adequate to account for the diversity and complexity of factors that influence behavioural decisions. Previous research examining determinants of social behaviour, as well as research specifically addressing environmental issues, has found limited success in explaining a substantial portion of variance in social issue behaviour. Numerous theoretical positions have been investigated including attitude theories, concepts of behavioural efficacy and self-efficacy, expectancy/value models of motivation as well as theories of psychological motivation, and to some extent human value systems. Although evidence supporting the role these psychological phenomena play in guiding behaviour has been noted, clarifying the complex interplay among the numerous behavioural determinants remains a significant challenge.

A number of prominent researchers have recently noted with dissatisfaction the absence of "synthesis" in social psychological research (Aronson, 1992; Berkowitz & Devine, 1989; Eagly, 1992). Aronson (1992) stated that the imbalance in favor of analysis over synthesis has led to "a plethora of small theories with hardly anyone taking the trouble to try to find the common ground among these theories (p. 309)." Berkowitz and Devine (1989) pointed out that the lack of synthesis is costly in that synthesis offers advantages in terms of economy of thought and cohesion among different approaches. In the realm of attitude theory, where debate continues regarding the operational definition and predictive utility of the attitude construct, Eagly (1992) noted that "a more comprehensive understanding of attitude-behavior relations could emerge from joining ... traditions - that is, from formulating

causal sequences that take into account both attitudes toward behaviours and attitudes toward the entities or targets toward which behaviors are directed" (p. 696). She also pointed out that numerous moderator variables have for the most part not been integrated into explicit theories of attitude-behavior relations.

Therefore, it was determined that synthesizing current theory into one unified framework would be a vital step in the research process. Such a framework could then be employed to analyze the specific theoretical and applied issues of concern. This thesis is divided into two parts corresponding with these research steps. Part I confronts the challenge of reviewing and synthesizing the vast psychological literature that attempts to explain and predict social behaviour, integrating it into a single comprehensive framework. Specifically, in Part I, various factors found to be implicated in guiding behaviour are identified and observations regarding the explanatory utility of each factor are presented. The relevant psychological issues include: (a) attitude theory (Chapter 1), (b) theories of efficacy and self-efficacy (Chapter 2), (c) expectancy-value theories and other salient models of motivation (Chapter 3), and (d) theories of human value systems (Chapter 4). In these chapters I elaborate upon the conceptualization of each theory, discuss the major research that has examined the relevant constructs embedded in them, and explore the utility of these constructs in explaining environmentally-relevant behaviour.

Part II of this thesis describes the procedures and results of attempts to empirically investigate the phenomena under study. Three studies were conducted to explore both the theoretical and applied questions. For each study, the rationale that guided its development is enumerated and specific hypotheses pertaining to the objectives of the study are presented. Prior to the description of the specific studies, methodologies and hypotheses common to all three are presented (Chapter 5). Next, Study 1 is detailed, in which the influence that each factor noted in the framework has on a subject's intentions to perform a specific environmentally protective action was investigated (Chapter 6). Study 2, which addressed unanswered questions from Study 1 is reported next, and specific conclusions based on these

findings are discussed (Chapter 7). These two studies revealed that decisions regarding environmentally-related behaviour are based on the complex array of factors presented in the framework. One notable result was the emergent role of human values in this decision process. Consequently, Study 3 was designed to explore the specific influence of human values on environmentally-related behavioural decisions, with particular emphasis on decision-making in circumstances of ecological-personal conflict (Chapter 8). The thesis concludes with a discussion of how the proposed framework can contribute to the investigation of issue-oriented social behaviour (Chapter 9). In addition, implications regarding environmentally-related behaviour and the human decision process are discussed.

It should be noted that in each of these studies, the criterion phenomena of focus is not actual behaviour, but its most closely related construct, behavioural intentions (Ajzen & Fishbein, 1980). Although understanding and explaining actual social behaviour in a naturalistic setting is the ultimate goal of behavioural research, it is often difficult, if not impossible, to collect behavioural data in a context that allows for flexibility in the selection of a criterion and control over the experimental setting. Therefore, researchers have often studied the factors that influence behaviour choice rather than actual behaviour. It is assumed that most social behaviours are under volitional control, and, therefore, behavioural intentions are considered the direct antecedent of behaviour (Ajzen & Fishbein, 1980). Thus, explaining and predicting behavioural intentions and choice becomes a vital step in understanding actual behaviour.

Part I

A Sociocognitive Framework of Social Issue Behaviour

Overview

The framework presented in Figure 1 is the result of a comprehensive synthesis of the numerous theoretical conceptualizations used to explain social behaviour and behavioural choice. Although there are distinct affective components inherent in the behavioural process, the framework is primarily concerned with delineating the beliefs, motives, and values that have been identified by past social psychological research as implicated in the behavioural decision process. The development of the framework involved three steps. First, I reviewed relevant social psychological theory and, where necessary, dissected each theory into its individual components. The most common operationalization of each component was identified in order to search for overlap among constructs.

Once the essential components of each theory were identified, I found it necessary to reassess the terminology associated with certain concepts so that they would more accurately represent the exact nature of the construct. For example, the concept of "attitude" has been used, as well as measured, in quite diverse ways. Some researchers assess attitudes in terms of affective evaluations of general objects or events, whereas others consider them useful only as they relate to specific, well-defined behaviours. To achieve a cohesive and understandable final model, each component of the framework needed to be distinguishable from all others. Substantial overlap among theories, and the use of common terminology does exist. Identifying the unique quality of each theoretical concept was a significant challenge. This process necessitated the selection of a single interpretation for each construct. In doing so, I relied on the way that a construct had been consistently measured in previous research, rather than how it had been generally defined.

The third step involved recognizing constructs that have been previously neglected in this area of study but could reasonably be construed as playing an important role. The most noteworthy of these factors is personal values. Whereas the importance of value systems in

influencing human activity is well-noted (Rokeach, 1973), rarely has their role in this process been investigated in terms of how they relate to other constructs (see, Homer & Kahle, 1988 for exception). I argue that the limited empirical attention given to values has been deleterious to psychology's attempt to develop a full understanding of the behavioural decision process regarding social issues.

The genesis of the framework originated in the specification and differentiation of three distinct domains of cognitive factors (2nd column in Figure 1). These are represented by the following statements: (a) I believe, therefore I act; (b) I can, therefore I act; (c) I desire, therefore I act. The first statement refers to the concept of attitudes as guides to behavioural choice. Although attitudes are presently construed as having an affective as well as a cognitive component, I suggest that the phrase 'I believe' is a reasonable representation of the concept of attitude. This conclusion is based on the fact that attitudes are often inferred from an individual's response to a series of belief statements (Ajzen & Fishbein, 1980). The second phrase reflects the notion of self-efficacy or personal control as a determinant of behavioural intentions. The third statement identifies the motivational force provided by the need or desire to attain certain outcomes from one's actions. Within each domain, various components are posited in order to represent the diversity and complexity of each cognitive guide.

Chapter 1

Attitudes

Attitudes are believed to play a vital role in individuals' assessments of their world (Pratkanis & Greenwald, 1989). Although attitudes are recognized as a core construct in social psychology, the exact nature of their function is still debated. Early theories of attitudes specified numerous overlapping functions which attitudes serve (see Shavitt, 1989, for a review). These include a knowledge function (e.g., Katz, 1960; Katz & Stotland, 1959), that is, attitudes help the individual organize and structure the environment and provide consistency in one's frame of reference. In addition, an attitude can guide behaviour by summarizing the outcomes associated with an object suggesting the path that maximizes rewards and minimizes punishments.

Accordingly, Smith, Bruner, and White (1956) proposed an object-appraisal function which presumes that attitudes serve as guidelines for classifying objects and structuring the environment to make responses available that maximize one's own interests. They posited a social adjustment function which suggests that attitudes help facilitate self-expression and social interaction. Attitudes also play a major role in maintaining self-esteem, a function that Smith et al. called "externalization" and Katz termed "ego-defense."

Pratkanis and Greenwald (1989), in their recently developed sociocognitive model of attitudes, integrated the early functional theories and concluded that attitudes serve three functions: (1) they provide a simple strategy for appraising an object, (2) they organize and guide complex behaviour, and (3) they define and maintain self-worth. A common perspective among these theorists (e.g., Katz, 1960; Pratkanis and Greenwald, 1989; Smith et al, 1956) is that attitudes function as a guide to behavioural decisions.

While Pratkanis and Greenwald's model proposes that attitudes serve as causal agents regarding behaviour, there is also support for viewing the causal path in the reverse direction. In fact, the behaviour-to-attitude link, derived from both Festinger's (1957) cognitive dissonance theory and Bem's (1972) self-perception theory, has been demonstrated to be quite

strong (e.g., Festinger & Carlsmith, 1959; Zanna, Olson, & Fazio, 1981). Additional support for this causal path is found in research on the effects of direct experience on attitude strength and behaviour (Fazio & Zanna, 1981). There is little doubt that past behaviour can influence and/or change attitudes, but this conclusion does not conflict with the position that attitudes can also function as a guide to behaviour. Thus, the causal path appears reciprocal in that attitudes function as a guide for future behaviour, and in turn may be influenced by any previous direct experience with the attitude object. This chapter is concerned primarily with understanding the path going from attitudes to behaviour.

In line with this conceptualization of attitude, I adhere to the definition of "attitude" as a general evaluation of an object, event, or issue - a combined affective and cognitive appraisal that is best inferred from responses to general belief statements regarding that object. This definition, and approach to measurement, stands in contrast to that offered in Fishbein and Ajzen's prominent "Theory of Reasoned Action" (Fishbein & Ajzen, 1975) and its updated version, the "Theory of Planned Behaviour" (Ajzen, 1985). Their theory suggests that in order to understand and predict behaviour, the most salient attitude object is the actual target behaviour, and not the more general object or issue under study. Attitudes towards more global objects or issues which may be associated with the behaviour are several steps removed in the causal chain and are considered to have minimal utility in predicting behaviour. For example, the association between attitudes toward capital punishment (pro or con) and a corresponding behaviour (volunteering for a group lobbying for your position) would likely be minimal while significant correspondence would exist between attitudes toward the behaviour (i.e., pro or con regarding volunteering for the group) and the behaviour itself. I argue that in order to fully understand complex patterns of social behaviour, the general attitude construct should be part of a comprehensive theoretical framework. The relation between general attitudes and attitudes towards particular behaviours (this construct will be discussed in detail later) could then be examined.

Fishbein and Ajzen's attitude concept is also considered a function of beliefs, but a set of beliefs quite different from the broader interpretation I have just noted. They postulate that a person who believes that performing a given behaviour will lead to a "positive" outcome will hold a favorable attitude toward the behaviour, while a person who believes that performing the behaviour will lead to mostly negative outcomes will embrace an unfavorable evaluation of the behaviour. They specifically assess a person's attitude toward a behaviour in terms of expectations regarding the accrual of various outcomes and the value placed on those outcomes. One's general attitude toward a behaviour is inferred from balancing the positive and negative expected outcomes. To illustrate, a person who believes that recycling will help the environment, will save money, and will make the family happy (all positive outcomes) will likely hold a positive attitude toward recycling. A person who believes that recycling doesn't really help the environment, has costs in terms of money and time, and diverts attention away from real problems will likely embrace a negative attitude toward recycling.

Although a number of studies provide empirical support for Fishbein and Ajzen's conceptual model (see Ajzen & Fishbein, 1973), one major concern with the "attitude-toward-act" measure is its limited application (Schwartz & Tessler, 1972). Whereas the attitude-toward-act measure improves prediction of a given behaviour, it diminishes the strength of the overall attitude concept. Within the present program of research, I am just as interested in the role that attitudes toward issues, objects, or events (i.e., the environment and environmental preservation) play in guiding behaviour, as in more specific beliefs regarding one particular action.

This is a case where clarification of terminology is required. In an attempt to resolve this definitional quagmire, I thought it most reasonable to conceive of "attitudes" as the general evaluation most current theorists construe it to be, and to define Fishbein and Ajzen's "attitude" construct in terms of its two core components - outcome expectancy and outcome

value. I will return to this issue when I discuss motivational and expectancy/value theories of behaviour.

Attitude-behaviour correspondence

The proposed framework identifies two general aspects of attitudes that prior work has suggested are necessary for a complete understanding of how attitudes influence action. First, as previously noted, it is proposed that an individual's general attitude toward a specific issue, object, or event predisposes that individual toward acting in a certain manner (Pratkanis & Greenwald, 1989). Thus, attitudes serve a heuristic purpose regarding behavioural decisions. Attitudes provide a cognitive base upon which people make decisions. A person who "likes" strawberry jam, is more likely to buy strawberry jam than someone who dislikes that flavor. The attitude "I support environmental protection," in theory, would likely induce one to engage in specific environmentally-protective behaviours, such as recycling.

Although this conceptualization of attitude is widely held, the connection between attitudes and behaviour has frequently been challenged. The study that kindled much of this critical view of the attitude construct was conducted by sociologist Richard LaPiere (1934). In his well-known study, LaPiere spent two years investigating the relation between prejudicial attitudes and acts of racial discrimination. He traveled the U.S. with a young couple from China visiting 251 eating and housing establishments. Only once did LaPiere observe an act of discrimination, even though prejudice against Chinese people was prevalent at that time. In a follow-up questionnaire sent to the original establishments, over 90% of the 128 replies reported that they would not accept members of the Chinese race in their establishment. These findings have been considered questionable (Dillehay, 1973) due to the possibility that the people who provided the behavioural data in LaPiere's field study may not have been the same subjects who responded to the attitude questionnaire. Nevertheless, it has been noted that these findings suggest that "people can hold abstract opinions which have little or nothing to do with their actual behaviour" (Plous, 1993, p. 59).

In 1969, Wicker fueled an anti-attitude discourse with his review of 46 studies in which attitude-behaviour correspondence was explored. For his review, Wicker selected only those studies that measured attitudes and their expected corresponding behaviour at different times, suggesting this was the only way to truly test attitude-behaviour relations. He concluded that attitudes are likely to be unrelated or only slightly related to actual behaviours. This conclusion was based on the finding that in relatively few cases was a correlation of over .30 observed, and that traditional attitude toward object measures rarely accounted for as much as 10% of variance in overt behaviour. Later, he went so far as to suggest that it might be prudent to abandon the attitude concept as a meaningful psychological construct.

Fortunately, very few researchers heeded Wicker's suggestion. Instead, attitude research began to focus on the reasons why attitude-behaviour discrepancies were frequently found. One approach was to examine the methodology used in the assessment of both attitudes and behaviours. When the studies cited in Wicker's review were reanalyzed, his conclusions were challenged due to numerous methodological concerns (e.g., Dillehay, 1973; Weigel & Newman, 1976). Weigel and Newman (1976) attempted to address several of these concerns in their study of attitude-behaviour relations. They found evidence that general attitudes can accurately predict behaviour, but only when they are employed to predict a general pattern of behaviour and not a specific action. They administered a Likert style attitude measure about the environment to 44 residents of a New England town. Follow-up behaviour measures were collected after approximately twelve, eighteen, and twenty-six weeks. The general attitude measure predicted the subjects' general pattern of behaviour toward the environment quite well ($r = .62$), but it was not a good predictor of any single action. Ajzen and Fishbein (1977), in their review of research examining attitude-behaviour correspondence, reported additional evidence that strong attitude-behaviour relations can be obtained when there is high correspondence between the attitude and behaviour entities (either general to general or specific to specific), especially between the target and the action elements. Since that time, substantial research has focused on defining potential mediators

and/or moderators of attitude-behaviour correspondence. The results of this research will be discussed later in this chapter and in Chapters 2 through 4.

Although the empirical relation between attitudes towards issues and corresponding behaviour is at best uncertain, the theoretical connection between them is too strong to dismiss. Thus, I support the position that attitudes predispose individuals to act in certain ways. Often, though, other factors may be more directly involved in guiding one's behaviour, thereby limiting the influence that attitudes may have. The exact place for this construct in relation to the other possible factors remains to be confirmed. One goal of the current research was to examine these relations in the realm of environmental behaviour.

Attitudes as predictors of environmentally-protective behaviour

There have been numerous studies investigating the relation between attitudes and environmental behaviour. Hines, Hungerford, and Tomera (1987) conducted a meta-analysis of environmental behaviour research to determine which variables appear to be most influential in guiding individuals to engage in environmentally-protective behaviour. The attitude-behaviour relation was a central feature of this review. For the purposes of this analysis, attitudes were defined as those factors that "dealt with the individual's feelings, pro or con, favorable or unfavorable, with regard to particular aspects of the environment or objects related to the environment" (p. 4). This broad factor included assessments of general attitude toward the environment as well as attitudes toward specific environmental actions. Results from the analysis of fifty-one measures found a corrected correlation between attitudes and behaviour of .35. Thus, it was shown that individuals with more positive attitudes were more likely to report engaging in environmentally-protective behaviour.

Hines et al.'s analysis attempted to address the distinction between general attitudes and attitudes regarding specific actions. They found that there were two types of attitudes being assessed by researchers: (a) attitudes toward the environment as an issue, and (b) attitudes towards taking environmental action (e.g., attitudes toward recycling, conserving energy, etc.). Although they found a slightly stronger relation between attitude toward

actions and environmental behaviour (r = .38), the relation between general attitude toward the environment and environmental behaviour was quite strong (r = .34). Thus, they concluded that "both of these types of attitudes were related to behaviour in an environmental context" (p. 4). It is interesting to note that somewhat higher attitude-behaviour correlations were found in situations where actual behaviours were measured (r = .43) than were found in studies where behaviours were measured by self-reports (r = .33). One can conclude from this finding that both methods of measuring behaviour are valid, and that self-reports may actually deflate, rather than inflate attitude-behaviour correspondence as some critics suggest (e.g., Wicker, 1969).

Other studies have failed to find a significant relation between general attitudes and specific environmental behaviour. As previously mentioned, Weigel and Newman (1976) found that subjects' general attitude toward the environment did significantly predict whether or not the subject engaged in any of three actions (i.e., signing a petition, roadside litter disposal, recycling), but had little value in predicting the enactment of one specific action. Oskamp et al. (1991), in their investigation of household recycling behaviour, found similar results: general proecology attitudes failed to discriminate between recyclers and nonrecyclers. In addition, various studies have found little or no relation between attitudes toward the environment and consumer-oriented environmental behaviour, such as installing home insulation and purchasing environmentally-friendly products (Balderjahn, 1988).

It is relatively clear that attitudes toward issues function as guides to behaviour, but it would be most accurate to describe this relation as indirect and inconsistent. In fact, most studies show that other behavioural determinants (e.g., efficacy beliefs, economic costs) either mediate or moderate the attitude-behaviour relation. For example, people with a positive attitude toward the environment appear to be willing to change their purchasing habits (buy environmentally-friendly brands) to protect the environment. However, this behaviour is blocked if the prices for environmentally-friendly brands are higher than other brands (Henion, 1972), leading to a reduced influence of the attitude.

In an attempt to explore this process more comprehensively, Axelrod and Lehman (1993) measured general attitudes toward the environment as well as various other known behavioural determinants in both student and community samples. They also collected self-reports regarding the performance of 22 environmentally-protective behaviours. These behaviours included political (e.g., donating money or time to environmental organizations) as well as household behaviours (e.g., recycling, buying environmentally-friendly products). They found that general attitudes were highly associated with an index of total behaviour (r = .45), but that this relation became nonsignificant (partial r = .11) after partialling out the variance accounted for by other factors (e.g., self-efficacy beliefs and outcome expectancies) in a multiple regression analysis.

In sum, attitudes towards issues can be important guides to behavioural decisions. A significant association is likely to exist when a general attitude is related to a similarly general course of behaviour. The relation is weakened when the behaviour of interest is restricted to one specific action. As well, when other guides to behaviour are included in a multivariate analysis, the relation between attitudes and behaviour may be attenuated. Thus, although it is presumed that people's attitudes toward the environment provide a guide to decisions regarding environmental behaviour, the directness of this relation is questionable. Although some clarity is emerging regarding the role that general attitudes play in guiding social issue behaviour, further exploration is needed to isolate other salient guides to behaviour and incorporate them into a comprehensive behavioural framework. The rest of this chapter and Chapters 2 and 3 describe the factors posited to be more direct determinants of social behaviour, and therefore believed to mediate and/or moderate the attitude-behaviour link.

Attitude Strength

One of these factors is the second component described in the attitude domain of the proposed framework. Based upon research by Fazio (e.g. Fazio & Zanna, 1978), Krosnick (1989), and others (see Raden, 1985, for a review), it is suggested that the strength of one's attitude may have a direct effect on behaviour, but more likely it either mediates or moderates

the attitude-behaviour relation. For example, the stronger one's favorable attitude toward environmental protection, the more likely he or she will act in an environmentally protective manner. A number of dimensions related to attitude strength have been reported to influence their predictive utility. Attitude strength has been conceptualized in terms of several cognitive dimensions (see Krosnick, Boninger, Chuang, Berent, & Carnot, 1993 for a review). These include: (a) the extremity of the evaluation, (b) the certainty or confidence with which the attitude is held, (c) the accessibility of the attitude, (d) the amount of direct experience an individual has had with the attitude object, (e) the extent to which the individual has a vested interest in the attitude, and (f) the level of importance placed on the attitude object by the individual.

Extremity refers to the extent to which an individual's evaluation of an attitude object deviates from the midpoint on an attitude scale (e.g., Judd & Johnson, 1981). Extremity of attitudes is rated along scales such as favorable-unfavorable and strongly agree-strongly disagree.

Certainty refers to the confidence held by an individual that his or her attitude toward an object is correct (Krosnick et al., 1993). Fazio and Zanna (1978) provided evidence that certainty can moderate the attitude-behaviour relation. For persons expressing high certainty regarding a specific attitude, significant attitude-behaviour correlations were found, whereas for individuals expressing low certainty no relation was found.

Several theorists have proposed that the accessibility of an attitude is a measure of attitude strength (Fazio & Williams, 1986; Fazio, 1989; Krosnick, 1989; Sherman, 1987). Attitude accessibility refers to the strength of an object-evaluation link in memory. It has been measured by the length of time it takes subjects to report their attitudes. Fazio (1989) conceptualized attitude strength as a continuum ranging from nonattitudes to highly accessible attitudes. Strength of attitude is defined by the object-evaluation link in memory and is measured by the speed and ease with which the attitude can be accessed from memory (Krosnick et al., 1993). As with certainty, strong attitude-behaviour correspondence is found

for highly accessible attitudes, while little or no relation is observed for attitudes that are difficult to access (Fazio, Chen, McDonel, & Sherman, 1982; Fazio & Williams, 1986). Kallgren and Wood (1986) found that attitude accessibility influenced attitude-behaviour consistency in the domain of environmental activism. Specifically, subjects with relatively high levels of access to their attitudes regarding environmental preservation (mostly supportive) were likely to act in a manner consistent with their attitudes. Subjects with little access demonstrated low attitude-behaviour consistency.

Regan and Fazio (1977) have argued that attitudes can be distinguished by the manner in which they were formed. Some attitudes are formed through direct behavioural experience (e.g., having a crime committed against oneself may influence attitudes about crime prevention) while others are based on accumulating information through indirect, or nonbehavioural means (e.g., news reports of crime). Their research, along with that of Fazio and Zanna (1978), shows that attitude-behaviour consistency is higher for attitudes based on direct experience than attitudes formed in other ways. Attitudes formed through direct experience have been found to be more accessible (Fazio et al., 1982) and held with greater confidence (certainty) than attitudes formed through other means. Since these dimensions have been found to be interrelated (see Raden, 1985), it is not known whether greater attitude-behaviour correspondence is a direct effect of one of these specific strength dimensions or mediated through a central dimension.

Sivacek and Crano (1982) have argued that when an individual has no vested interest with respect to the attitude object or the behaviours suggested by it, the attitude-behaviour link should be weak. Their research revealed that high vested-interest subjects had higher attitude-behaviour correlations than subjects in low or moderate vested-interest groups.

A number of studies (e.g. Granberg, 1985; Snyder, 1982) have shown the significant influence of the importance (salience) of the attitude object on the ability of the attitude to predict relevant behaviour. Attitude importance has been defined as the extent to an individual cares about the attitude object. It is usually operationalized by self-reports of the

importance ascribed to the attitude object (Krosnick, Boninger, Chuang, Berent, & Carnot, 1993). Research has shown that people are more likely to act on issues that are personally important to them then they are to act on issues with which they are not personally connected (e.g., Krosnick, 1989, 1990; Sherif, 1980; Sivacek & Crano, 1982).

In their multivariate study of the factors that guide environmental behaviour, Axelrod and Lehman (1993) included a measure of issue importance. They found that subjects' assessment of the importance of the environment as a social issue strongly predicted their performance of environmentally-protective behaviours ($r = .55$). In addition, the predictive utility of the issue importance construct remained significant when analyzed simultaneously with eight other behavioural determinants (partial $r = .26$). As previously noted, this was not the case for general attitude, whose strong univariate correlation with self-reported behaviour was reduced to non-significance in the multivariate model.

Thus, the extent to which an attitude object is perceived as more or less important, as well as the broader notion of attitude strength, has been shown to influence the attitude-behaviour relation. It should be noted that although the described aspects of attitude strength are typically thought to reflect underlying dimensions of one overall concept, it has recently been found that these dimensions reflect distinct, but related constructs (Krosnick et al., 1993). Krosnick et al. (1993) conclude that "it seems reasonable to use the term attitude strength as a shorthand way of saying that some attitudes are stable and consequential and others are not, or as a term for describing the group of constructs that differentiate strong attitudes from weak ones" (p. 1143). They go on to suggest that each construct should be independently assessed and that "researchers should stick to terminology and conceptual approaches that are closer to the operationalizations they use in a particular study" (p. 1143). The present framework suggests that the construct of attitude strength may be an important factor in driving a person's decision to act, and should be investigated in some manner.

Threat Perception

Another factor that may be implicated in the behavioural decision process is beliefs toward other objects or issues that may bear on the decision. In fact, variance in behaviour within certain domains may be more directly accounted for by alternative beliefs about an issue rather than one's general evaluation regarding that issue. For example, to predict jam purchase behaviour, it would be prudent to assess attitudes towards a series of objects, not simply the flavor of the jam. For instance, the brand name and the cost of the product could be important evaluations to consider. Thus, a positive attitude toward strawberry jam could be overshadowed by a stronger incongruent attitude toward the brand or the package style and design of the product.

One specific evaluation that has been found to be salient when investigating issues related to health protection and/or lifestyle preservation is beliefs pertaining to the level of risk posed by a potential threat. This construct has been found to provide added explanatory utility when predicting protective behaviour (e.g., Axelrod & Newton, 1991; Becker, 1974; Paterson & Neufeld, 1987; Rogers, 1975; Wolfe, Gregory, & Stephan, 1986). Threat perception is currently viewed as a composite of beliefs regarding the: (a) likelihood of the event in question; (b) the appraised severity of the event; and (c) the immediate nature of the threat (Paterson & Neufeld, 1987). A number of behavioural models emphasize threat perception factors as important predictors of protective behaviour (e.g. Health Belief Model, Becker, 1974; Protection Motivation Theory (PMT), Maddux & Rogers, 1983). It is assumed that high perceptions of risk should lead individuals to perform actions intended to reduce or eliminate the risk.

Wolf et al., (1986) and Axelrod and Newton (1991) applied PMT to predict intentions to engage in efforts to prevent nuclear war. Both studies found a greater readiness to engage in protective behaviours (e.g., donations to peace organizations) when nuclear war was considered likely and its effects judged as severe. Axelrod and Lehman (1993) found similar results in the domain of environmental behaviour. Combining perceptions of the likelihood,

severity, and immediacy of risk posed by environmental destruction into one scale termed "threat perception," these researchers found that this construct explained a significant portion of variance in the reporting of environmentally-protective behaviour within a 9 factor multivariate model.

Summary

The attitude literature is fraught with inconsistencies regarding the function of attitudes and, more specifically, the influence attitudes have on behaviour. Much of this confusion stems from how one defines the concept of attitude. Some researchers believe that attitudes are only useful in guiding behaviour when they portray evaluative beliefs regarding a specific action. Others believe that this interpretation is too restrictive, and that much can be learned about social behaviour through the assessment of attitudes toward the issues/objects of interest. In the proposed framework, I address this conundrum by separating attitudes toward issues from attitudes towards actions (to be discussed in terms of outcome expectancies and values), as other researchers have recommended (e.g., Hines et al. 1987). In addition, the framework extends this attitudinal domain to reflect the importance of other salient constructs, including attitude strength and evaluations regarding other relevant issue/objects - in this case the potential risk posed by environmental harm. Both theoretical and applied research suggest that general attitudes towards issues do serve as guides to behaviour, but that this relation is usually indirect and is observable only when relating them to an equally general assessment of behaviour (e.g., Weigel & Newman, 1976). Other attitudinal variables, such as attitude strength and threat perception, may actually influence behavioural decisions more directly, but the nature of this interactive process is not yet clear.

Chapter 2

Self-efficacy and behaviour accessibility

Whereas individuals may hold strong attitudes on an issue of personal importance, they may not possess (or believe they possess) the abilities necessary to act consistent with their attitudes. In fact, an individual may not believe that any corresponding actions are available. People's beliefs about what they can do, as well as their perceptions regarding the ease with which an action can be performed, are viewed as important determinants of what they will do. Most social-behavioural theories now either center on or include the construct of self-efficacy or personal control in their model (e.g., Self-efficacy Theory, Theory of Planned Behaviour, Protection Motivation Theory). Work by Ajzen (Ajzen & Madden, 1986; Ajzen & Timko, 1986), Bandura (see Bandura, 1986, for a review), and Maddux (Maddux, Norton, & Stoltenberg, 1986), and their associates has clearly established that changes in self-efficacy beliefs are linked with behavioural change, and that self-efficacy is a strong predictor of behaviour. In addition, experimental research has supported the importance of self-efficacy as a determinant of behaviour (Bandura, Reese, & Adams, 1982; Davis & Yates, 1982; Maddux & Rogers, 1983).

For example, Bandura et al. (1982) examined the influence of self-efficacy on coping behaviour and fear arousal. In two experiments, they initially manipulated self-efficacy into different levels in phobic subjects. In a second phase, they successfully raised beliefs of self-efficacy to designated levels within the same subjects. After each manipulation, measures of coping behaviour were collected. They found that coping behaviour corresponded significantly to self-perceptions of efficacy, such that higher levels of perceived self-efficacy were associated with increased performance. This relation was found across various modes of manipulation, different types of behaviour, and in both intragroup and intrasubject comparisons.

Although the concept of efficacy is well established, different components of efficacious beliefs have yet to be clearly defined. The basis of the efficacy concept stems

from the notion that self-referent cognitions mediate the relation between knowledge and action (Bandura, 1986). It is suggested that how people judge their own capabilities will affect their motivation and behaviour. As Bandura states, "people tend to avoid tasks and situations they believe to exceed their capabilities, but they undertake and perform assuredly activities they judge themselves capable of handling" (p. 393).

The present framework divides efficacious beliefs into two constructs - self-efficacy and channel efficacy. The definition of self-efficacy suggested here was initially set forth by Bandura (1986). He defined perceived self-efficacy as "a judgment of one's capability to accomplish a certain level of performance" (p. 391). In other words, it refers to the expectation that one is able to engage competently in the specific action of concern, rather than one's ability to achieve a certain outcome. The latter concept, often referred to as either response efficacy or response-outcome expectations, refers to a judgment regarding the likely consequence of a behaviour. For example, the belief that one <u>can</u> conserve energy is an self-efficacy judgment, whereas the anticipated economic savings, social rewards, or environmental benefit derived from such an action would be considered outcome expectations. The former conceptualization of self-efficacy identifies it as an independent construct, distinguishable from outcome expectancies. I suggest that Bandura's outcome expectancy construct parallels Fishbein and Ajzen's behavioural belief concept, both representing the influence that expected behavioural consequences have on behavioural choice. I have placed outcome expectancy under the domain of motives because it most parsimoniously represents the influence of outcome goals on behavioural choice.

A second efficacy construct refers to perceptions of external barriers to action, rather than a focus on internal capabilities as with self-efficacy. This notion, which I have termed "channel efficacy," posits that one's belief about the ease with which behaviours are accessible to the individual is an independent influence on behavioural choice. Kurt Lewin was the first to acknowledge the importance of seemingly minor but actually important aspects of a situation that may affect behaviour, which he called "channel factors" (see Ross &

Nisbett, 1991 for a review). Lewin recognized that behaviour is often produced by the opening up of some channel and sometimes closed by the blocking of a channel. I suggest that the influence on behaviour exerted by channel accessibility manifests itself through one's beliefs regarding the accessibility of a behaviour. In other words, it is not simply how accessible a behaviour is, it is how accessible a behaviour is perceived to be. For example, individuals with equal access to a behavioural channel (such as a recycling depot) are likely to vary greatly in their beliefs regarding how accessible the depot is. It is believed that this appraisal will directly influence the individual's intentions to act, and represents a conceptually independent aspect of control.

A recent study by Boyd and Wandersman (1991) supports the unique importance of channel efficacy in guiding behaviour. They assessed the utility of various factors as predictors of subsequent condom use, and found that beliefs regarding the convenience of using a condom accounted for a substantial portion of the variance in actual condom use over a three month period (18%), more than any other single belief. They also found that beliefs in self-efficacy (i.e., condoms are easy to use) significantly explained a portion of variance (5.8%). Thus, there is reason to believe that self-efficacy and channel efficacy represent independent constructs.

Efficacy beliefs and environmental behaviour

Strategies used in the public sector to promote environmentally-responsible behaviour often focus on making behaviours seemingly more efficacious. Many interventions attempt to improve the infrastructure with respect to a certain behaviour by making the actions more accessible and by building a sense of self-efficacy. For example, communities across North America have noted that curbside recycling programs (collecting recyclables from individual residences) have significantly increased recycling activity. It can reasonably be asserted that curbside recycling programs increase recycling behaviour in part because they make the action more accessible (i.e., channel efficacy). Another tactic often used is to provide people with the information necessary to feel competent to perform a desired behaviour. For example,

brochures are created to provide consumers with specific instructions on how to conserve energy, thereby building a sense of self-efficacy or personal competence necessary to engage in the desired behaviour.

In addition to this non-scientific evidence, there is empirical support for the importance of efficacy in this domain. In their meta-analysis, Hines et al. (1987) reported on 15 studies that investigated the relation between individual efficacy perceptions (which they termed "locus of control") and environmental behaviour. The corrected correlation across these studies was $r = .36$, indicating that those individuals who had a strong sense of personal control or efficacy were more likely to engage in environmentally protective behaviours than were individuals exhibiting a lower sense of personal efficacy.

Axelrod and Lehman (1993) found that both self-efficacy and channel efficacy regarding environmental actions accounted for significant amounts of explained variance in subjects' reports of past environmental behaviour. Numerous other studies have shown that efficacious beliefs can have a significant influence on the performance of environmentally-responsible actions (Huebner & Lipsey, 1981; Kantola, Syme, & Nesdale, 1983; Thompson & Stoutemyer, 1991).

Summary

Beliefs regarding the efficacy of performing a certain behaviour clearly influence behavioural decisions. Two efficacy constructs are proposed. The first construct, self-efficacy, has long been construed as an important determinant of behaviour. Correlational research has found a strong association between self-efficacy and corresponding behaviours. In addition, evidence supporting the contention that self-efficacy is a causal agent in the behaviour decision process has been found through experimental study. The second construct, "channel efficacy," although previously neglected in much social issue research, is now receiving its due as a construct that contributes uniquely to the explanation of social behaviour. Both self-efficacy and channel efficacy have been found to be significantly associated with the performance of environmentally-protective behaviours. Multivariate

research is needed to explore the exact nature of the relation among efficacy beliefs, attitudinal beliefs, and other salient behavioural guides, such as outcome expectations.

Chapter 3

Behavioural Motives

The third domain of behavioural determinants identified in the present framework refers to the influence of individual needs, desires, and expectations on behaviour. Clearly people's actions are guided by a strong yearning to secure outcomes that satisfy basic needs and fulfill individual desires. Sustenance, pleasure, wealth, friendship, knowledge, respect, self-respect and peace of mind are just some of the vast number of goals found to motivate social behaviour. The notion that people's behaviour is directly motivated by the pursuit of needed and desired outcomes seems almost too obvious to research. Yet, the link between functional motives and behaviour can be quite complex, and, at times, unpredictable. The challenge, as I see it, regarding the psychological investigation of motivation and social behaviour, is to determine what contextual and personal characteristics influence the intensity with which differing motives are experienced.

Past research has shown that the amount of influence motives have on behaviour is dependent on the extent to which a desired outcome is expected as a consequence of one's action (outcome expectancy) and how much the individual values that outcome (outcome value). Most models that purport to explain social behaviour rely to some extent on perceptions regarding outcome expectancies and values (e.g., Ajzen & Fishbein's Theory of reasoned action, 1980; Bandura's Self-efficacy Theory, 1986; Triandis's Theory of Social Behaviour, 1980). For example, Maddux, Norton, and Stoltenberg (1986) investigated the direct influence that outcome expectancies, outcome values, and self-efficacy had on subjects' decision to perform a specified behaviour. Much of their reasoning was based on Bandura's work. Written communications were used to manipulate each factor independently into high and low levels. The essays described an interpersonal communication technique that could increase one's success in dealing with problematic social encounters. Subjects in the high outcome expectancy condition were led to believe that the technique was extremely effective, while subjects receiving the high outcome value essay learned that the use of this technique in

interpersonal situations would increase success in these interactions (this manipulation assumed that "success" was of value to subjects). It was argued to subjects in the high self-efficacy condition that the technique is very easy to learn and perform. Subjects in the low conditions of each factor received essays arguing the opposite position (i.e., not effective, of little value, difficult to learn and use). Although experimental results supported the contention that outcome expectancies significantly influence behavioural intentions, they failed to do so for outcome value and self-efficacy. In contrast, correlational analyses found that all three variables were significant, and roughly equivalent predictors of intentions.

This study showed that expectations regarding the accrual of positive and valued outcomes significantly motivate behavioural decisions. However, it is not surprising that people who believe they will accrue positive outcomes from an action intend to perform that action. Therefore, investigating the multifaceted nature of expectancy/value beliefs is thought to be a worthwhile endeavor. This approach was prompted by the fact that the complex nature of outcome expectancies and values as behavioural motivators has not been systematically studied. Outcome expectancies have generally been analyzed in simplistic terms of valence (e.g., positive/beneficial versus negative/harmful), as was done in the Maddux et al. study. I suggest that the next step in this line of research is to delve deeper into people's motives for performing an action by classifying outcome expectancies in terms of substantively different, and possibly conflicting, outcome domains. I contend that different classes of outcomes must be recognized and systematically studied within the same research program in order to establish a more comprehensive understanding of how different motives may influence behaviour through expectancy/value beliefs.

The field is currently experiencing a renewed interest in the study of behavioural outcomes in terms of their functional utility in motivating social issue behaviour. For example, Omoto and Snyder (1990) have applied a functional approach, more commonly identified with attitudinal theory, to the study of AIDS volunteerism. Functional theorists have argued that the same attitude may serve different psychological functions for different

people (e.g., Katz, 1960; Smith, Bruner, & White, 1956; Snyder & DeBono, 1987, 1989). Similarly, Omoto and Snyder (1992) assert that a functional approach may hold great promise for unraveling the complex web of personal and social motivations that serve as the foundations of volunteer activity. They go on to state that one of the key elements in a functional approach, and one of the primary reasons they feel it has utility beyond the field of attitudes, is its explicit concern with motivation. A functional approach creates the opportunity to understand how thoughts and actions that share the same surface features may actually reflect different motivational processes for different individuals. This approach can be used insightfully in all areas of social issue behaviour, and, as we shall see, is particularly relevant in understanding the array of motivations underlying environmental action.

People certainly can engage in the same behaviours for very different reasons and with different outcomes in mind. By examining the root motives that may underlie people's overall evaluation of outcomes to be gained from a certain action, we can identify precisely the most salient and/or powerful motives, as well as explore potential individual differences in how those motives are manifested. The initial step in this process was to group possible motivations in general categories, which could serve as a foundation for analyzing specific areas of behaviour. It should be noted that both outcome expectancy and outcome value refer to beliefs regarding outcomes derived from a specific situation. It is anticipated that the trait notion of personal values, more so than the state belief of outcome value, may be useful in explaining behavioural decisions. This expectation is based on the notion that although outcome expectancies are clearly reliant on aspects of a specific situation, the extent to which an outcome is valued is set by an internal, stable individual belief system. Personal values will be discussed in Chapter 4.

Functional Motives and Environmental Action

Drawing upon previous research and theory, I have identified three broad domains of human needs and desires that will serve as the foundation from which to understand the motives involved in the realm of environmental action. Different behavioural domains will

necessarily involve different possible outcomes. Therefore, I focused on those outcomes reasonably associated with environmental action. First, in accordance with a central tenet of equity theory (Walster, Berscheid, & Walster, 1973) and economic utility theory (Simon, 1957), people are believed to be motivated to maximize their own economic or material gain from personal action. This class of outcomes can be thought of as tangible in nature, primarily referring to outcomes such as economic or material rewards and/or avoidance of economic, material, or time costs. For example, people would be prone to act environmentally protective if there were some economic benefit linked with their actions (e.g., energy conservation leading to reduced energy bills).

Various studies have found that the use of lotteries, prizes, and other economic rewards or messages produces increased levels of environmentally protective behaviour (e.g., Jacobs & Bailey, 1982; Luyben & Bailey, 1979; Margolin & Misch, 1978). Recently, Needleman and Geller (1992) compared the influence of eight different intervention strategies to increase people's recycling activity in a workplace setting. The interventions included environmental appeals, inducements such as a small, non-economic gift, goal setting, and raffles for prizes. In fact, they found that the economic intervention (i.e., raffles) was the only effective one. In their study of recycling behaviour, Vining and Ebreo (1990) found that whereas both recyclers and nonrecyclers were motivated by a concern for the environment, nonrecyclers were more concerned with economic aspects of the situation. Thus, economic motives seem clearly implicated in motivating, and possibly blocking, environmentally protective behaviour.

The second class of outcome expectancies originates from theories of social influence (e.g., see Aronson, 1991 for a review) and is consistent with Ajzen and Fishbein's (1973) notion of subjective norms. This class of outcomes holds that people are motivated to act by "social" factors, such as seeking belongingness and acceptance in a social group and avoiding social embarrassment. In contrast to other theories, where the influencing path is not directly related to perception of outcomes, the present framework defines social influences in terms of

their correspondence with related outcome expectancies and values. I believe it is, in fact, advisable to investigate social influence in this manner in that social outcome expectancies, such as avoiding embarrassment, enhancing one's image, or gaining respect from others, can play a significant role in guiding behaviour.

Social influence strategies have often been employed to promote environmentally protective behaviour. Nearly all of us, at some time, feel pressure from others to act in the "socially prescribed" way. One reason for the success of curbside recycling programs across North America, in addition to the obvious reason that recycling is made more convenient, is likely to be the social aspects of the behaviour. People tend to observe whether or not their neighbors are recycling, and are likely to be motivated by the example set by them. Social pressure can foster intensified environmentally protective behaviour. For example, Aronson and O'Leary (1983) found that students would conserve water more (by modifying their manner of taking a shower) when their actions were observable and more conservation-oriented behaviour had recently been modelled by a fellow student. Vining and Ebreo (1988) found that social pressure presented by one's peers was reported to be an important reason for recycling.

Although few scholars would dispute the strong influence social pressures can exert on behaviour, it is often difficult to ascertain the extent of their effect. For example, Vining and Ebreo (1990) failed to find a difference between recyclers and nonrecyclers in their recognition of social motives. This finding contrasts with the results from their earlier study in which social pressures were reported as influential (Vining & Ebreo, 1988). One explanation for this inconsistency is that people may, at times, underestimate the influence of social pressures because admitting that social pressure affected one's behaviour can be perceived to reflect a weakness in one's character. I suggest that the desire for social acceptance and belongingness is basic to all people (at least to some extent), and that this motive can be a positive force. The difficulty in observing this phenomenon, particularly in contrived situations or when relying on self-reports, presents the researcher with a formidable

challenge. Nevertheless, the impact of social goals should be included in a comprehensive discussion of functional motives and social behaviour.

The third class of outcomes identifies consequences that are intended to benefit some external entity. The motivation underlying this class of outcomes stems from the personal satisfaction people accrue from contributing to a cause they value. Individuals are motivated by a desire to pursue objectives regarding the specific issue of concern, and are not necessarily concerned with accruing any tangible or social benefit. Krosnick (1990) and Omoto and Snyder (1990) have noted a similar motive in their research in the areas of politics and volunteerism, respectively. (An extensive review of the theoretical literature on personal values and value-behaviour relations is presented in Chapter 4.) The influence of this class of outcomes can be observed in the expectation the individual has regarding the extent to which their behaviour benefits the source they support (e.g., the environment). For example, buying environmentally protective products may be personally more costly and have no perceived social benefits, but people may do it because of their desire to improve environmental conditions - an outcome likely to be consistent with a high value placed on the environment.

In fact, a desire to help the environment is the motivation most often presumed to underlie environmentally-protective behaviour. This contention has received substantial empirical support (e.g., De Young, 1986a, 1986b; Dunlap, Grienecks, & Rokeach, 1983). Thus, one's expectancy that this outcome would be achieved is presumed to be an important factor guiding one's behavioural decisions. Although this expectancy is strongly implicated, there is clearly more involved in these behavioural choices. We have already seen how economic and social factors can exert a direct influence on the performance of environmental behaviour. What is important to determine is the manner in which these different functional motives may independently and interactively influence individual behaviour.

Whereas these three classes of outcomes do not exhaust all possible behavioural motives (e.g., pleasure, intellectual growth), past theorizing and research suggest that this

typology represents a valid grouping of outcomes. One, two, or all three classes of outcomes may be perceived as antecedents of a single behaviour. Moreover, people are likely to be motivated to some extent by each of the outcome classes. Thus, for example, recycling has been promoted by the use of each class of outcome: economic (deposits on returnable bottles); social (setting of community standards); environmental (linking recycling to helping to protect the environment).

The relation between each class of outcome and behaviour can be, and should be, independently assessed. This is especially important in situations where positive outcomes may be perceived in one class (e.g., economic benefits), and negative outcomes (e.g., social embarrassment) in a second class. It should be noted that no evaluative connotation is intended in this classification system. Incorporating the potential for conflict among different outcomes is considered a vital step in understanding the role of outcome expectancies on behaviour.

Psychological Motives

Although the proposed framework focuses on functional motives, it would be neglectful not to include some discussion about the role of psychological motivations as guides to social behaviour. In this section, I will briefly describe two prominent theoretical approaches to understanding psychological motivation, dissonance theory (Festinger, 1957) and self-affirmation theory (Steele, 1988), and explore their explanatory value in the realm of environmental behaviour. I will introduce an alternative perspective regarding these theories - one which reveals a potential commonalty that has not as yet been pursued.

Dissonance theory states that if a person holds two cognitions that are psychologically inconsistent, he or she will be motivated to reduce that negative state just as a person needs to reduce hunger or other drives (Festinger, 1957). Dissonance theory arose as a way of explaining how behavioural changes can produce attitudinal change, rather than the reverse path. The claim of dissonance theory is that most people strive for three things: (1) to preserve a consistent and predictable sense of self, (2) to preserve a competent sense of self,

and (3) to preserve a morally good sense of self. As Aronson (1992) has explained it "what leads me to perform dissonance-reducing behaviour is having done something that (a) astonishes me, (b) makes me feel stupid, or (c) makes me feel guilty" (p. 305). Dissonance is strongest and clearest when it involves not just two cognitions but, rather, a cognition about the self and a behaviour that violates that self-concept.

Dissonance theory, as applied to environmental behaviour, would suggest that the best way to promote environmentally-protective behaviour would be to create a sense of dissonance in people that would motivate them to reduce dissonance by performing desired actions. Considering that while most people today report being concerned about the environment but few are actually highly active (Angus Reid Group, 1992; Gallup, 1990), the opportunity to promote environmentally-concerned behaviour through dissonance mechanisms seems substantial. This possibility was tested in a study that attempted to establish whether high consumers of energy would adapt their behaviour to conserve energy when placed in a cognitively dissonant situation (Kantola, Syme, & Campbell, 1982). The energy use of subjects, divided into four experimental groups, was compared. The four groups were: (a) a dissonance group, where people were informed that an inconsistency existed between previously measured attitudes toward conservation and their high use of electricity, (b) a feedback group, where people were notified that they were high consumers of electricity, (c) a tips only group, where people were sent information on ways to conserve electricity (also sent to the dissonance and feedback groups), and (d) a control group. While the dissonance group conserved more electricity than all other groups in an initial two-week measurement period, it differed from only the control group in a second two-week measurement period. It is reasonable to conclude that dissonance reduction was a motivator only in the immediate time frame following the intervention. Once a consonant state was reestablished, subjects' conservation behaviour regressed, although still higher than baseline. At this point, subjects seemed to be motivated by other factors - the same factors that motivated the other two

experimental groups (i.e., awareness of high energy use in general and concrete knowledge of ways to conserve energy).

Although this study appears to confirm the motivational influence of cognitive dissonance, the source of dissonance may not have been simply attitude-behaviour inconsistency. It may have been that the ability to reduce energy expenses was more clearly recognized (i.e., enhanced efficacy) in the dissonance group than in the other experimental groups. This recognition may have stemmed from a higher level of scrutiny of the subjects' behaviour in this group prompted by the attitude-behaviour inconsistency. This enhanced realization (i.e., the opportunity to save money) could have been the factor directly responsible for prompting them to reduce energy usage. In addition, they may have felt certain social pressures to conserve considering that their high usage of electricity was obviously public knowledge. The possibility that these outcomes motivated the behavioural change is consistent with a theory developed by Cooper and Fazio (1984). They noted that in all previous dissonance experiments, not only was inconsistency present, but so were aversive consequences. They asserted that it was these aversive consequences that aroused feelings of dissonance.

In a recent study examining the influence of dissonance on attitude-behaviour relations, Scher and Cooper (1989) found that experiencing dissonance can motivate attitude-behaviour consistency, but that dissonance arises from the perceived consequences of one's actions (aversive vs. nonaversive), and not attitude-behaviour inconsistency. Their study showed that subjects who freely chose to perform acts that could produce aversive consequences experienced feelings of dissonance and changed their initial attitudes regardless of whether these actions were consistent or inconsistent with their original attitudes. In contrast, subjects who were led to believe that their actions were unlikely to have aversive consequences experienced little or no dissonance and did not alter their opinions in either consistent or inconsistent situations.

Steele and Liu (1983) have also proposed a modification of dissonance theory. They agree that a need for consistency motivates behaviour, but they suggest that the need for psychological consistency is not part of the dissonance motivation. Their research suggests that self-affirmation objectives are the key to a consistency motivation, in that dissonance appears strongest when highly valued aspects of the self are most relevant. Recently, Steele (1988) has shown self-affirmation to be a distinct source of motivation. He found that if people are put in dissonance-arousing situations, not all of them will attempt to reduce dissonant feelings by changing their attitudes. Specifically, subjects who were given an opportunity to affirm some valued aspect of their self-concept as an alternative to attitude change were able to maintain their original attitudes even though the attitudes were incongruent with their behaviour. Self-affirmation theory suggests that a state of consistency is not essential (and inconsistency is tolerable) if an important aspect of the self in not involved. Steele and Spencer (1992) argue that maintaining one's integrity, and not self-consistency per se, is the primary motive influencing subjects in the majority of dissonance-related studies.

All of the proponents of these dissonance-related theories would agree that a dissonant state is psychologically troublesome, motivating a person experiencing this state to somehow reestablish cognitive balance, but they differ about what occurrences arouse this negative state. Whichever view is most accurate, their commonalty is that dissonance is most likely to occur when something that is highly valued by an individual is threatened (i.e., an aspect of the self-concept or negative consequences). An aspect of this phenomenon that has not yet been fully considered is the notion of "value systems" as they may influence dissonance arousal and resulting behaviour. What are the aspects of the self that are highly valued and how might these core values influence social behaviour? This issue seems important because people would likely look favourably upon behavioural outcomes that are consistent with, or enhance, their conceptions of themselves, and perceive outcomes that are inconsistent with their self-concepts as either negative or irrelevant.

To fully understand how dissonance functions as a motivation, it seems important to know more about the individual than his or her level of self-esteem. For example, if self-esteem is strongly linked to economic status, and not at all related to academic abilities, then dissonance would more likely occur when this individual's belief in their economic prowess is threatened. In addition, this individual would likely pursue economic outcomes in order to be consistent with, and possibly enhance, the perception of self. In fact, in this case, whether behaviour is seen as motivated by self-consistency, self-affirmation, self-enhancement, or behavioural consequences, the same predictions regarding the person's behaviour could be made: that is, dissonance will occur if the person's economic self (in terms of consistency or competence) is in some way threatened. The influence of personal values in the dissonance process, as well as in the broader behavioural picture, seems important and in need of further investigation.

Chapter 4

Personal Values

Personal values, as suggested in the proposed framework, function as a foundation on which more specific attitudes, beliefs, and ultimately behaviour, are rooted. As stated by Schwartz (1992), most theorists view values as "the criteria people use to select and justify actions and to evaluate people (including the self) and events" (p. 1). Values, as defined by Rokeach, (1980) are standards or criteria which guide action as well as other psychological phenomena such as attitudes, judgements, and attributions. Values are considered deeper and more stable than attitudes representing standards of "oughts and shoulds" (p. 272), and are viewed as determinants of attitudes. Rokeach refers to values as "core conceptions of the desirable" (p. 2), and posits that the number of human values is relatively small and capable of being embraced differently by individuals within a society. This conceptualization of values is consistent with Kluckhohn (1951), who defines values as "conceptions of the desirable means and ends of actions." Schwartz (1992) has added that "the primary content aspect of a value is the type of goal or motivational concern that it expresses" (p. 4). These definitions suggest that the values people embrace are responsible for guiding their pursuits in life. More specifically, values are construed as determinants of both attitudes and outcome beliefs. Accordingly, Rokeach (1980) has stated that a meaningful discussion of attitudes, behaviour, and attitude/behaviour relations is not complete unless it considers the influence of values.

Although the psychological importance of personal values has been noted, research examining the influence of values on social behaviour has not yet been fully explored. I believe this is due to problems that arise in operationalizing value systems and incorporating value orientations as factors in behavioural research. In other words, how does a researcher assess a subject's value priorities and then relate them to a behaviour of interest (e.g., volunteerism, recycling, voting)? Are personal value systems a social construct, or part of an individual's personality? Notwithstanding these difficulties, the potential importance of

personal values in guiding behavioural decisions should not be overlooked. A review of the prominent value and motivational structures is presented below (see Figure 2 for more details).

Description of Prominent Value Theories

One of the first value taxonomies dates back to 1931. Developed primarily by Gordon Allport, the Study of Values (Allport, Vernon, & Lindzey, 1960) distinguished six basic interests or personality motives: economic, social, theoretical, aesthetic, political, and religious. Briefly summarized, the economic person values that which is useful, judging things by their tangible utility; the social person most values love and connection with others; the theoretical person values the discovery of truth; the aesthetic person most values beauty and harmony; the political person values power and influence as an end; and the religious person most values unity, seeking communion with the cosmos. The Study of Values measured the relative strength of each value by having respondents complete a series of statements in which they rank ordered options (either 2 or 4 options) that represented different value orientations. For example, one item read "To what extent do the following famous persons interest you: (a) Florence Nightingale; (b) Napoleon; (c) Henry Ford; or (d) Galileo." Each response option represented a different value (i.e., social, political, economic, and theoretical, respectively). Although the reliability and validity of this value measure has received substantial empirical support (e.g., Cantril & Allport, 1933; Duffy, 1940), the content of the measurement instrument is quite dated in terms of some of its response options (today, most people probably could not identify all of the noted historical figures). This, in part, accounts for its limited use in recent years.

A second dominant theory of values was proposed by Maslow (1970, 1971). Maslow conceived of human behaviour as motivated by certain needs or values (in fact, he used the two words interchangeably), which were hierarchically ordered. At the first level of the hierarchy were physiological and safety needs - the things that people need to live physically healthy and secure lives. Once people satisfy their basic needs, they then seek to satisfy

desires for belongingness and love. The two higher-order needs involved developing self-esteem and ultimately seeking to become fully themselves - to "actualize" all that they potentially can be. Maslow's theory defines concisely what can be considered core motivational domains, although certain concerns with its structure can be identified. First, there is no allowance for individual differences in the extent to which a need is valued. Second, it is unclear how one would assess whether or not a certain need has been satisfied. For example, the amount of security or love needed to satisfy an individual's need is more accurately understood as a psychological construction, rather than some definitive, universal level. Thus, substantial individual variance in the perception of this level is likely to exist. Maslow's theory's most relevant contribution is its recognition of those needs presumed to motivate all people in some manner.

Milton Rokeach pioneered much of the recent study and delineation of value systems by developing the Rokeach Value Survey (1967). Rokeach (1973) described the nature of human values as guided by five assumptions: "(1) the total number of values that a person possesses is relatively small; (2) all people everywhere possess the same values to different degrees; (3) values are organized into value systems; (4) the antecedents of human values can be traced to culture, society and its institutions, and personality, (5) the consequences of human values will be manifested in virtually all phenomena that social scientists might consider worth investigating and understanding" (p. 3). Rokeach argued that the value concept, more than any other, should occupy a central position across all the social sciences.

Rokeach divided values into two domains: desirable modes of conduct (instrumental) and desirable end-states of existence (terminal). He proceeded to identify 18 values in each domain, which he claimed made up the totality of human values. Because the notion of values as portrayed in the present framework focuses on their potential motivational role, Rokeach's terminal values are highlighted. Examples of the values denoted by Rokeach include: a comfortable life, a sense of accomplishment, equality, family security, mature love, self-respect, and true friendship (see Figure 2 for a complete list). To assess an

individual's value structure, respondents simply rank-order all 18 values from most important to least important.

Rokeach (1973) has reported a substantial body of data, which shows that one or more of these values significantly predicts corresponding behaviours of interest. These behaviours include participating in civil rights demonstrations, church attendance, and political activism, among many others. While the ranking of one value (equality) seems to be important in a great many behaviours, Rokeach has found that any one behaviour is likely to be predicted by many values. In total, over 33% (252 out of a possible 684) of reviewed value-behaviour relations were found to be significant. In addition, Rokeach's values have been found to predict significantly many theoretically related attitudes. In fact, Rokeach (1980) argues that "it is difficult to identify socially important behaviours or attitudes that are *not* predicted by one or more values" (p. 274).

Although Rokeach's value survey has been widely used, some researchers have expressed various concerns with his paradigm (e.g., Clawson & Vinson, 1978; Kahle, 1983). These criticisms include a loss of information because of rank orderings, difficulty of the lengthy ranking task, and ambiguous relevance of many of the values to daily life. In an effort to resolve some of these concerns, Kahle (1983) developed an alternative, simplified structure which he called the List of Values (LOV). The LOV defines nine values thought to be relevant to daily life and construed as motivational in nature. Kahle also suggested that values be rated independently, rather than rank-ordered.

In a recent study of consumer behaviour, Homer and Kahle (1988) examined the influence that values have on consumer attitudes and behaviours regarding the purchase of natural food products. Using factor analyses, they were able to determine three underlying factors that accounted for 64.4% of the variance. Factor 1 comprised four values: (a) self-fulfillment, (b) excitement, (c) sense of accomplishment, and (d) self-respect. Factor 2 included three values: (a) a sense of belonging, (b) being well-respected, and (c) security. Factor 3 included: (a) fun and enjoyment and (b) warm relationships. They identified Factor

2 as representing an external dimension of values, whereas Factors 1 and 3 were considered more internally oriented. Using this factor structure in a causal modelling analysis, they found that certain values were important in predicting attitudes towards the product of interest, and that those attitudes, in turn, led to corresponding behaviour. Thus, attitudes played a mediating role between values and behaviour. Several precautions regarding the specific nature of their study were presented, thereby limiting the generalizability of their conclusions. These included recognizing that these relations were studied in only one specific context, and that social behaviour should not be seen as merely an expression of values and no other determinants. They suggest that "now the challenge is to verify these findings in other situations" (p. 645).

An impressive attempt to construct a universal value structure has recently been conducted by Shalom Schwartz and his associates (e.g., Schwartz, 1992; Schwartz & Bilsky, 1987, 1990). Schwartz began his search for a typology of universal value domains by theorizing that values could be derived from "the universal requirements reflected in needs (organism), social motives (interaction), and social institutional demands." Schwartz's approach to defining values relied on three underlying ideas: (1) that values must represent the interests of some person or group, (2) that a distinction between individualistic (e.g., ambition) and collectivistic (e.g., helpfulness) interests is useful, and (3) that the different motivational domains in which universal human requirements are expressed provide a basis for distinguishing among value contents. Using the values suggested by Rokeach (1973) as markers, Schwartz and Bilsky (1987) initially derived seven universal and distinctive motivational domains of values (enjoyment, security, social power, achievement, self-direction, prosocial, restrictive conformity), plus an eighth domain they termed "maturity" which represented goals that people reach only through experiencing life (cf., Maslow's self-actualizing need).

Schwartz and Bilsky (1990) have since revised their value theory numerous times based on a series of cross-cultural studies that included respondents from 20 countries,

representing varied cultures. In the majority of these studies, respondents were asked to rate each of 30 terminal values and 26 instrumental values in terms of their influence as a guiding principle in their lives on a nine point scale ranging from "of supreme importance" to "opposed to my values." From these studies, an updated factor structure has been determined that includes 10 value domains (seen in Figure 2), two of which probably need some clarification. First, Tradition refers to respect, commitment, and acceptance of customs in one's culture. This content domain stemmed from the notion that groups in every culture develop practices that represent their shared experience. Complying with tradition becomes an important motive in many individuals. Second, Universalism incorporates the idea of maturity and part of the prosocial domain described in an earlier structure (Schwartz & Bilsky, 1988, 1990). The motivational content of this value is perceived as the understanding, appreciation, tolerance, and protection of all people and of nature. In contrast, Benevolence refers specifically to concern over the welfare of close others in everyday interaction. After much research, Schwartz (1992) has concluded that the content, measurement, and structure of values represented in this value typology seems "sufficiently well established to justify their adoption as the basis for future research..." (p. 60).

A New Value Taxonomy

Although Schwartz's value structure appears to be quite reliable and comprehensive, its utility as a tool to explain and predict social behaviour is questionable. No procedure for identifying the value orientation or preferences for an individual is identified, and no link between the value domains and social behaviour has been offered. These limitations, in combination with the concerns noted regarding the other value theories, suggest a need for an alternative value taxonomy, one that would be more in line with the requirements of multivariate behavioural research. The results of an endeavour to create such a taxonomy can be seen in Figure 3.

Three primary objectives were considered in determining this new structure and its associated assessment process. First, the value domains identified in the structure should

involve concrete motivational content in terms of daily behavioural decisions. Many of the values noted in the Rokeach, Kahle, and Schwartz models have motivational implications that are either unclear (e.g., equality) or can vary greatly in what an individual perceives as meeting that goal (e.g., what stimulates or excites one person may not stimulate or excite someone else). Thus, each domain should be consistently construed as representing the same goals, even though the extent to which each goal is valued will vary across individuals.

Second, the list of domains should be simplified to include only those core domains that seem to be universal goals that people find important at least to some extent. Schwartz and Bilsky (1987) identified three core domains which they referred to as "universal human requirements." These included (a) biologically based needs, (b) social requirements, and (c) group welfare and survival. These three requirements are consistent with motivational guides identified in the social psychological literature (reviewed in Chapter 3), and therefore they served, in part, as a foundation on which the proposed value taxonomy was constructed.

Third, it was deemed desirable to be able to ascribe a "value orientation" (i.e., identifying one value domain as most important when compared to all others) to individuals, in the tradition of the Study of Values (Allport et al., 1960). Representing human values as an individual difference construct would create the opportunity to analyze behavioural patterns across individuals who embrace different, and possibly conflicting, value orientations. As previously noted, values are considered to be deeply rooted and stable predispositions. They are considered an integral part of a how a person defines oneself. By assigning a dominant value orientation to individual subjects, the influence that values have on behavioural decisions can be explored in a different, possibly more revealing, manner than typically done in value research. For example, differences in the behaviour of independent groups as defined by their value orientations (e.g., economically-oriented vs. socially-oriented) can be explored using experimental procedures. This design enables the researcher to examine the link between values, behavioural decisions, and other salient factors. A complete review of

the procedures used to assess individual value orientations for the proposed value structure is presented in Chapter 5.

The proposed value structure identifies a triarchal classification of motivational domains: (a) economic, (b) social, and (c) universal. Although derived from a different conceptual base, it is interesting that this structure closely parallels the classification scheme described earlier for outcome desires. One important difference is that the earlier value taxonomy was developed to describe generic motivational domains. In contrast, the latter classification was developed to describe the motivations that specifically guide environmental behaviour.

The first domain refers primarily to goals such as economic security or achievement, material rewards and/or avoidance of economic, material, or time costs. It parallels the sustenance needs identified by Schwartz and Bilsky (1987) and Maslow (1970, 1971), although it more accurately reflects the value placed on economic and material desires regardless of one's actual need situation. This is an important distinction because the pursuit of economic gain appears to motivate behaviour well beyond a time when physical needs are satisfied. The desire for economic outcomes can be seen as a psychological need, and achievement in this area is highly valued by people who place it at the top of their value hierarchy. This motivational domain is considered most consistent with Rokeach's "a comfortable life" and Allport et al.'s "economic person."

Economic goals can influence many, if not all, issue-oriented social behavioural decisions. In terms of the present study, economic goals, both personal and societal, are often implicated in environmental decisions. For instance, on a personal level, purchasing environmentally-protective products may necessitate spending more money. On a societal level, reducing the amount of logging may mean the loss of income for numerous people. Although this motivational domain is usually construed as external in nature, it is suggested that people also seek and receive internal satisfaction from attaining these outcomes. Economically-oriented people judge themselves based on their economic status and success.

The second motivational domain represents the social aspects of life. It specifies desires regarding social consequences from one's actions and includes both belongingness and conformity drives (see Aronson, 1991 for a review) as well as aspects of social altruism (e.g., Schwartz, 1977) and benevolence (Schwartz, 1992) motives. It postulates that the motivation to seek belongingness and acceptance from others is a central guiding force in decisions to act. Each of the value theories reviewed earlier includes at least one domain that involves social needs. It is postulated that conformity and belongingness values, as well as a part of benevolent values, are rooted in relationship needs and desires. Thus, actions in accordance with these desires would, theoretically, lead people to pursue goals such as the welfare of close others as one means of maintaining and/or enhancing one's feelings of connection with others.

Social values and desires are frequently noted in discussions of environmental behaviour (see discussion in Chapter 3 on social motives). For instance, conformity can be observed in the influence of modelling on environmentally protective behaviour, the desire for belongingness can induce people to act in a manner consistent with valued others, and the value placed on benevolence may prompt socially-oriented people (people who place social values at the top of their hierarchy) to act environmentally-protective when they believe their actions can help minimize the plight of other people. Although the proposed social domain includes several components, a single factor representing this value is consistent with the social requirement identified by Schwartz and Bilsky (1987), the belonging and love need proposed by Maslow (1970), and the social person described by Allport et al. (1960). I believe that the benevolence aspect of the social domain is rooted in the desire for personal acceptance and belongingness.

The third motivational domain, "universal," is most consistent with Schwartz's (1992) "universalism" domain. The motivational content of this value type involves the pursuit of self-respect garnered from making a contribution to the betterment of the world, particularly as it pertains to pursuing and attaining outcomes that correspond with universalistic-type goals

(e.g., equality, environmental preservation). Pursuing these goals may, in fact, involve certain social or economic costs, which the universally-oriented individual is willing to incur. For example, protesting the harvesting of a section of forest may mean a loss of a job and have no perceived social benefits, but people may do it in response to their desire to improve environmental conditions - an outcome consistent with a desire to act in a universalistic manner. This motivational domain is most strongly reflected in those people willing to violate laws and court injunctions and risk substantial fines in order to achieve a certain goal - in this case preventing the continued destruction of the natural environment.

Concisely stated, humans are believed to be motivated by three fundamental terminal goals: economic, social, and universal. People who highly value one domain over the other two will likely be oriented to act in ways consistent with that goal. Thus, behavioural decisions will be most influenced by the motivational domain each individual values most highly. The importance an individual assigns to each goal will be the foundation upon which her or his behavioural choices are rooted.

One cautionary consideration regarding the construction of this value taxonomy should be addressed. First, although each domain is presumed to be an independent source of motivation, overlapping values among the domains may occur. To illustrate, universal goals may involve principles such as social justice - a goal that blurs the line between the social and universal value orientations. This confusion can be addressed by recalling the basic motivations associated with each domain. People with a social orientation are most concerned with maintaining and enhancing connection with others. When applied to social issue concerns, this goal is considered consistent with pursuing outcomes that are believed to benefit a majority of people. People adhering to a universal value orientation embrace a contributory ethic - one which emphasizes the pursuit of a personal conception of universal goals. Perhaps the most obvious place this distinction can be observed is when a trade-off between universal goals and either social or economic outcomes is involved.

More specifically, value distinctions can be understood by examining particular issues in which different value orientations would necessarily lead to different behavioural decisions. One example is the situation where social good is in conflict with environmental good. In this case, it would be predicted that someone with a social orientation would pursue outcomes consistent with perceived social good (e.g., immediate benefit for a majority of people), whereas someone with a universal orientation, who also strongly values the environment, will likely pursue environmental good, even if it means social or personal sacrifice. This hypothesis, as well as the role that value orientation plays in guiding issue-oriented social behaviour, is explored later in this thesis.

One final distinction that can be made regarding these value orientations is the relativity of each domain. The universal domain, and to a lesser extent the social domain, are substantially context free. They can be attached to any issue and may imply different corresponding behaviours depending on the normative ideals of the group being investigated. Universally-oriented people are particularly likely to hold strong beliefs that may or may not be laudable. This would depend on whether their beliefs and goals are consistent with one's own ideals. In contrast, the economic domain is mostly context dependent where the pursuit of economic goals would be less dependent on the ideological norms of a society. Normative influences may come into play, but only in the extent to which economic goals are valued, and would not vary much from issue to issue.

Values and Environmentalism

The proposed taxonomy of values parallels two recent value/ethical classifications developed specifically with respect to the environment (Merchant, 1992; Stern, Dietz, & Kalof, 1993). Stern et al. (1993) proposed a social-psychological model that presumes that the pursuit of environmental quality may stem from any of three value orientations: Egoistic, Social-altruistic, and Biospheric. They posit that egoistic values predispose people to perceive decisions regarding environmental protection in terms of how they, personally, would be affected. In contrast, people who adhere to social-altruistic values judge decisions in the

environmental context based on an evaluation of the costs and benefits for a wide social group. These orientations can be differentiated by the outcome of most immediate and direct concern. Egoistic people emphasize personal gain, whereas Social-altruistic people are most directly concerned with social good. People guided by biospheric values judge environmental decisions based on perceived costs or benefits to ecosystems of the biosphere.

In a similar structure, Merchant (1992) outlines three "Grounds for Environmental Ethics" (p. 64) as: Egocentric, Homocentric, and Ecocentric. An Egocentric ethic refers to the maximization of self-interest under which people adhere to a philosophy that what is good for each individual will benefit society as a whole. People who embrace a Homocentric ethic believe in "the greatest good for the greatest number of people," adopting social justice as their guiding doctrine. An Ecocentric ethic holds that rational, scientific belief systems would be based on laws of ecology and in the "unity, stability, diversity, and harmony" of the ecosystem. Merchant suggests that individual/society environmental practices will be consistent with the ethical grounding to which individuals/societies adhere.

Whereas the similarities between Stern's and Merchant's models and the proposed value taxonomy are significant, an important difference is that the proposed value taxonomy was developed generically - not based on any single issue. Therefore, this value structure offers a more basic motivational model with which to explore individual differences in pursuing environmental preservation, the issue of interest in this thesis.

Clearly, if only beneficial economic, social, and universal outcomes could be derived from the same course of action, little conflict would exist among people who embrace different value orientations, as well as within an individual. Unfortunately, economic well-being is often at odds with environmental preservation, as in the case of the "commons dilemma." Although people are certainly influenced by all three motivational domains to some extent, they are likely to develop hierarchies in their values which guide their decisions regarding specific concerns such as ecological dilemmas.

Whereas specific expectations regarding the relation among values, other behavioural determinants, and decisions regarding environmental behaviour will be presented for each study, several general hypotheses can be identified. First, economically-oriented individuals are likely to engage in environmentally protective behaviour when it is linked with some tangible benefit. If no positive environmental-economic link is apparent, economically-oriented people would not be expected to act in environmentally protective ways. When there is no apparent link between economics and environment, economically-oriented people may or may not act in support of environmental protection. In this case, their actions would be guided by other behavioural cues. This pattern would be true for the other value orientations as well. Socially-oriented people would be predisposed to actively seek environmental preservation primarily when there is some perceived social benefit associated with the decision - either for other persons or for themselves. In contrast, universally-oriented people would be predisposed to favor environmental protection under any circumstances, as it is presumed to be a goal that they are likely to value strongly.

Second, it is hypothesized that people who embrace a universal value orientation will be most likely to actively pursue environmental preservation, whereas economically-oriented people would be least likely, due to the conflict that often (but not necessarily) exists between economic and ecological concerns. This conjecture is based on the noted similarities between the proposed value taxonomy and the environmental value structures identified by Stern et al. (1993) and Merchant (1992), as well as other research that has explored the connection between values, motivation and the environment (e.g., De Young 1986a, 1986b; Dunlap et al. 1983, Neuman, 1986). For example, Dunlap et al. (1980) found that people who performed an environmentally protective behaviour (i.e., recycling) emphasized principled values such as aesthetics and self-actualization (values consistent with a universal orientation) and deemphasized personal values such as safety and security. This research suggests that preserving and protecting the natural environment is a widely embraced normative ideal that has primacy with universally-oriented people in our culture. In addition, it is presumed that

when conflict between environmental concerns and personal needs exist, people will be guided by the motivational domain that they most highly value. For example, economically-oriented people will likely emphasize personal economic interest over potential environmental harm.

Summary

Personal values are an important factor to consider when investigating issue-oriented social behaviour. They are believed to be deeply rooted, stable beliefs with strong motivational content. Thus, attitudes, outcome expectancy beliefs, and social behaviour are likely to be strongly influenced by one's value orientation. Three value domains are suggested to represent global motivational domains that guide issue-oriented behavioural decisions: economic, social, and universal. People who embrace one value domain as most important will be biased toward pursuing behavioural outcomes that correspond with that value. The relation among values (as defined by the proposed taxonomy), other behavioural determinants, and environmental behaviour is a central focus of the present course of research.

Summary - Part I

Five specific features thought to refine our current understanding of various cognitive constructs and how they may influence behavioural decisions have been proposed. First, it is suggested that a general attitude measure (toward issues, objects) be incorporated into any comprehensive attempt to explain and predict social behaviour. The assessment of this general attitude should not be confused with measuring attitudes toward specific actions. Many recent behavioural models have focused on expectancy-value beliefs or attitudes towards specific actions as determinants of behaviour neglecting the more global attitude construct. This may be due to the fact that its relation with social behaviour has been found to be inconsistent, even though widely accepted attitude theory contends that attitudes function, in part, as guides to behaviour. It is suggested that the term attitude be used to represent general evaluations of objects or issues, and that Ajzen and Fishbein's (1980) attitudes-toward-action construct be defined in terms of its operational components: beliefs regarding outcome expectancies and outcome values.

Second, the framework suggests that two corollary attitudinal constructs be assessed in conjunction with a general measure of attitude. These are the strength of one's attitude, and attitudes toward related objects (e.g., the threat stemming from environmental destruction). Both theoretical and empirical work have demonstrated that these constructs can be important predictors of social behaviour. One manner in which they may influence behavioural decisions is by mediating the relation between one's general attitudes and the behaviour in question.

Third, the designation of an underexplored efficacy concept termed "channel efficacy" is suggested. This construct represents an individual's belief regarding the accessibility of a behaviour. Although there is a long history of research on the impact that accessibility of a behaviour has on its enactment, beliefs regarding accessibility have rarely been studied as an independent factor.

Fourth, a systematic exploration of different types of outcomes (i.e., economic, social, and environmental) in terms of their motivational influence is recommended. This structure recognizes the complex and dynamic interaction that may exist between the motivational force exerted by different types of outcomes. It also proposes that the relation between social behaviour and expectancy/value beliefs can be more productively studied and understood when desires regarding different outcome domains are investigated independently within an inclusive multivariate design.

Fifth is the recognition that personal values may play an important role in the behavioural decision process. It is suggested that much social behaviour is rooted in these deep-seated, stable predispositions. Environmental behaviour, in particular, appears to be related directly to individual values, and a great deal of explanatory information can be lost if personal values are not incorporated into a multivariate analysis of behavioural decisions. A triarchic taxonomy of values is proposed that identifies three core motivational domains: economic, social, and universal.

In general, the proposed framework should be viewed as a research tool rather than as an explanatory model. It outlines a multivariate structure in which the salient constructs necessary for conducting a comprehensive investigation of decision-making regarding social behaviour are presented.

Part II

Investigating the factors that guide decisions regarding environmental behaviour: A test of the sociocognitive framework

Overview

The procedures and results of three studies that explored the association that each factor outlined in the framework has with behavioural decisions are presented. The first two studies focus on identifying the model that most parsimoniously explains decisions to perform one specific environmental action. The third study broadens the investigation to explain and predict decisions of more personal and societal consequence. Specifically, this study examines the influence that personal values, attitudes, and outcome conditions have on the behavioural decisions of subjects placed in hypothetical Commons Dilemma type situations. Theoretical and applied implications of these studies are then discussed.

Chapter 5

Measurement of independent factors

In this chapter, the assessment techniques employed to measure the independent factors common to all three studies are described. These factors include the attitudinal variables (i.e., general attitude, attitude importance, and threat perception) and subjects' value orientations. The pre-test questionnaires used to assess these variables were administered approximately one month prior to the implementation of each study. Specifically, there were two pre-test administrations that employed the same procedures: one provided data for Study 1 ($\underline{n}$ = 645) and the second provided data that were used in both Study 2 and Study 3 ($\underline{n}$ = 622). Pre-test questionnaires were distributed to undergraduate psychology students during a class period. Students were asked to complete the questionnaire and return it at the next class period. Respondents received course credit for their participation.

In an effort to maintain consistency regarding the testing of these constructs, the assessment methods varied only slightly across the two pre-tests. Certain measurement concerns observed in the pre-test for Study 1 prompted slight modifications in the content of the assessment instruments used in Studies 2 and 3. These variations dealt primarily with improving reliability. Variables specific to each study (i.e., efficacy beliefs, motivational constructs) are detailed in the corresponding chapter.

Measuring Attitudinal Factors

Three attitudinal variables were assessed in the pre-tests: (a) general attitude toward the natural environment and environmental protection, (b) the importance of environmental issues, (i.e., measure of attitude strength), and (c) threat perception (see Appendix 1 for listing of exact items). In both pre-tests, general attitude was assessed using a scale consisting of six items, which measured respondents' general beliefs regarding the environment and beliefs regarding how human beings should interact with the natural world. Developing an attitude scale from responses to belief statements has been found to be a reliable and valid means of assessing attitudes (e.g., Ajzen & Fishbein, 1980). Moreover, because recent

polling evidence suggests that most people would support a simplified attitudinal statement such as "I support environmental protection," an attempt was made to promote variance in attitudes by having subjects respond to more controversial belief statements. Thus, respondents were asked to indicate how they felt about six belief statements regarding the environment and its protection on a scale ranging from "strongly disagree" to "strongly agree." Adequate internal consistency was found in the first pre-test (Cronbach's Alpha of .69). Slight wording modifications resulted in increased reliability in the second pre-test (Cronbach's Alpha of .75).

Issue importance was assessed by two items that measured the absolute importance of the environment to the individual as well as its relative importance compared to numerous other social concerns, such as AIDS and poverty. These two items were correlated, $\underline{r} = .49$ in Pre-test 1 and $\underline{r} = .38$ in Pre-test 2.

The construct of threat perception was formed by combining responses pertaining to perceptions of the likelihood, severity, and immediacy of environmental destruction, (3 total items). Acceptable scale reliability was found in both pre-tests (Cronbach's Alphas of .73 and .72, respectively).

Measuring Value Orientations

Personal value orientations were assessed using a new ipsative measure developed by the author. Measuring values by having subjects rank order the importance of value domains in relation to one another has been suggested as the most appropriate manner with which to assess value systems (Rokeach, 1973). This new device, modeled after the "Study of Values" by Allport, Vernon, and Lindzey (1960), provided the means by which individuals could be assigned a value orientation (See Appendix 2 for item wording). The instrument calls for subjects to assign a numeric value to each of three response categories (representing each of the three value domains) so that the total numeric value applied across all three responses is equal to 4. There are eight items in total. A sample item from the instrument is "Which of the following goals do you pursue more strongly: (a) achieving a sense of belonging and

acceptance from others; (b) attaining a comfortable and financially secure life; or (c) maintaining a sense of self-respect derived from acting in accord with deeply held values?" For example, a highly economically-oriented subject might assign a 4 to response (b), and a value of 0 to the other two responses. Someone who is less economic in orientation, but still values economic goals more highly than the other two value domains, might respond by assigning a 2 to (b), and a 1 to each of the other two options. Scale scores for each value domain were computed and four value groupings were created: economic, social, universal, and a mixed group in which no value domain dominated.

Subjects' value orientations for Study 1 were assigned initially based on whether or not their scores were greater or equal to one-half SD above the mean on one of the three value orientation scales. After recruitment of subjects for this study was completed, a review of subjects' value orientations suggested that dividing subjects into four groups based upon a more stringent criterion (greater or equal to one SD above the mean) would provide a more useful classification.

In an attempt to classify subjects with more confidence, two criteria were employed to determine whether a subject was to be assigned a dominant value orientation in Study 2. First, a score on a particular scale had to be at least one SD above the mean. Second, the score needed to be higher than the scores on the other two scales. Approximately 52% of the pre-test subjects who provided usable data ($n = 531$) could be classified according to this procedure as either economically-oriented ($n = 89$), socially-oriented ($n = 66$), or universally-oriented ($n = 120$).

Reliability and validity tests were conducted for the three value orientation scales. In the first pre-test, both the economic and universal scales had adequate internal consistency (Cronbach's Alphas of .75 and .62, respectively). The reliability of the social orientation scale fell below usually desirable levels (Cronbach's Alpha = .33). Implementation of slight modifications in wording improved reliabilities in the second pre-test (Cronbach's Alphas of .80 for economic, .74 for universal, and .48 for social). The lower reliability observed for

the social scale may suggest that this motivational domain is more complex in nature than the other two. Notwithstanding the relatively low reliabilities for the social scale, taken as a whole, the instrument appeared to exhibit acceptable internal consistency in classifying subjects' value orientations.

The validity of the instrument was explored in two ways. First in Pre-test 1, concurrent validity was examined by comparing the scales with subjects' responses on the Rokeach Value Survey (1967). Oneway analyses of variance were used to explore possible group differences in the ranking of three terminal values selected a priori as the beliefs most parallel to the three value orientations. Lower scores on the Rokeach values indicate a higher ranking. Significant differences were found in the rankings of "a comfortable life", $F(80) = 25.67$, $p < .001$, "true friendship", $F(80) = 5.93$, $p < .01$, and "equality", $F(80) = 2.93$, $p < .06$, where the latter two Rokeach values were considered the most analogous to the social and universal orientations, respectively. Tukey's HSD tests revealed that economically-oriented subjects ranked "a comfortable life" higher ($\underline{M} = 4.2$) than did both the social ($\underline{M} = 10.9$) and universal ($\underline{M} = 11.5$) value groups. Socially-oriented subjects ranked "true friendship" ($\underline{M} = 4.4$) significantly higher than did the economically-oriented subjects ($\underline{M} = 7.7$), but only marginally different than did the universally-oriented subjects ($\underline{M} = 5.3$). Finally, universally-oriented subjects ranked "equality." ($\underline{M} = 8.7$) significantly higher than did economically-oriented subjects ($\underline{M} = 11.5$), but only marginally higher than did subjects in the social value group ($\underline{M} = 9.9$).

Second, in Pretest 2, subjects were asked to rate the importance of various life goals using a 9-point Likert scale. Three goals presumed to parallel the value orientations were included: (1) "economic prosperity," (2) "quality of friendships," and (3) "acting in accord with your values." Analysis of variance procedures revealed, as would be expected, that there was a high degree of consistency between subjects' value orientations and their ratings of importance for the parallel goals. Thus, economically-oriented subjects rated "economic prosperity" significantly higher ($\underline{M} = 8.34$) than socially-oriented ($\underline{M} = 7.03$) or universal-

oriented (M = 6.16) subjects, F (283) = 43.99, $p < .001$; socially-oriented subjects rated "quality of friendships" higher (M = 8.63) than economically-oriented (M = 7.82) or universal-oriented (M = 8.35) subjects (though the difference was not significant in the latter case), F (283) = 10.88, $p < .001$; and universally-oriented subjects rated "acting in accord with your values" higher (M = 8.5) than economically-oriented (M = 7.05) and socially-oriented (M = 7.5) subjects, $F(283) = 37.99$, $p < .001$.

Although the potential for socially desirable responding regarding one's value orientation must be considered (i.e., pursuing universal goals can be considered more commendable than pursuing social acceptance or financial security), it can be concluded that socially desirable responding did not prevent subjects from endorsing "less" desirable options to any problematic degree. This conclusion is based on (a) the ease with which subjects could be assigned a value orientation, (b) the author's attempt to present all the response options in a positive frame, and (c) the significant differences among the value groupings and their rankings or ratings of parallel categories in the validity checks. To illustrate, even though means for the economic scale were, in general, lower than means for the social and universal scales (8.6 versus 11.7 and 11.6, respectively in Pre-test 2), there was a substantial portion of the sample who readily met the criteria for being identified as economically-oriented. Thus, although there may have been some bias toward the universal and social response options, this bias did not preclude a significant minority of respondents from reporting a high value for the economic goals. This pattern of responses may also stem from the use of a student sample in that economic issues may be less salient to university undergraduates than to the population in general.

The relation between attitudes and values was examined prior to conducting the experimental tests. Both pretests revealed similar patterns. Therefore only the results from Pretest 2 will be reported. As anticipated, favourable attitudes toward the environment were associated positively with a universal value [$r(614) = .35$, $p < .001$] and negatively with an economic value [$r(614) = -.34$, $p < .001$]. General environmental attitudes were

uncorrelated with the social value. When comparisons were made among subjects who embraced a particular dominant value orientation, similar findings were obtained. Specifically, analysis of variance procedures revealed a significant difference among the three value orientation groups [$F(281) = 17.27$, $p < .001$]. Thus, universally-oriented subjects reported the most favourable attitude ($M = 5.12$), economically-oriented subjects the least favourable attitude ($M = 4.29$), and the attitude of socially-oriented subjects fell between the other two groups ($M = 4.8$). Planned comparisons revealed that differences between pairs of groups were significant in all cases, $p < .05$. In the next three chapters, the role of these factors as guides to behavioural intentions is investigated in a multivariate format that includes other salient cognitive factors.

Chapter 6

Study 1: Determining the factors that guide environmentally protective behaviour

Overview

This study was designed to assess the relative contributions of each factor presented in the proposed framework as predictors of intentions to engage in an environmentally protective behaviour. Two analytic approaches were employed. First, expectancy/value beliefs regarding three types of possible behavioural outcomes, and self-efficacy beliefs were experimentally manipulated in order to examine their causal role in influencing behavioural intentions. These constructs were selected because they were presumed to be beliefs that were more susceptible to the planned manipulations than the other constructs. The effects of these constructs were also analyzed in terms of possible interactions with subjects' value orientations. Second, measures of outcome expectancies, outcome values, and efficacy beliefs were collected in order to assess their unique predictive utility in a multivariate procedure that also included the constructs measured by the pre-test.

The behaviour of interest was subjects' intentions to attend a workshop that would teach people how to recycle common household waste into handmade paper. This behaviour was selected for three primary reasons. First, it represented an activity that would be perceived as beneficial to the environment, while also involving possible economic and social benefits. Second, although a workshop that teaches the paper-making process actually exists, very few students know about it. Therefore, it was presumed that the subjects recruited for the experiment would enter the study with equally low information regarding this environmental activity. This assumption was confirmed by the subjects during debriefing. Third, attending the workshop and using the paper-making process are activities that could be convincingly presented as accessible to all subjects, regardless of possible demographic differences.

Self-efficacy beliefs and outcome expectancies were manipulated factorially using written descriptions of the workshop. This methodology was based on Maddux et. al (1986).

Self-efficacy was manipulated into high and low beliefs regarding subjects' perceptions of their capability of learning and using the paper-making process. In addition, four outcome conditions were created, three of which made salient one of three possible behavioural outcomes participants of the workshop would accrue if they attended the workshop: (a) economic, operationalized as saving money, (b) social, operationalized as impressing and earning respect from friends, or (c) environmental, operationalized in terms of helping the environment. A fourth description, which did not refer to any outcome expectancy, was included as a control. Measures of self-efficacy, channel efficacy, outcome expectancies and outcome values were collected, using questionnaires completed after the workshop descriptions were presented.

Hypotheses

Based on the framework, it was anticipated that correlational analyses would reveal that both efficacy beliefs and all three outcome expectancy variables would have significant univariate correlations with intentions to perform the targeted behaviour. Thus, higher beliefs of self-efficacy and channel efficacy, and higher expectancies regarding the possibility of saving money, receiving social benefits, and helping the environment would all be associated with a greater intent to attend the workshop. Of the outcome value measures, only the value placed on helping the environment was expected to correlate with behavioural intentions. The extent to which subjects valued economic or social outcomes as measured during the experiment was not perceived as providing a direct motivation related to environmentally protective behaviour. Finally, only minimal, but possibly significant, univariate relations between the general attitudinal constructs (i.e., general attitude, issue importance, and threat perception) and the target behaviour were expected. This hypothesis is based primarily on the differences in measurement (i.e, attitude objects were general and behaviour was very specific). Multivariate regression analyses were expected to show that both efficacy beliefs and outcome expectancies regarding all three outcome classes would explain significant levels

of variance in intentions to act, while any variance explained by the attitudinal variables and outcome value constructs would be negated.

With regard to the experimental manipulations, two main effects were expected. First, a main effect for self-efficacy was anticipated, with subjects in the high efficacy condition reporting stronger behavioural intentions than subjects in the low efficacy group. Second, considering that positive outcome expectancies should promote the performance of a behaviour, a main effect was predicted for the outcome manipulation (i.e., all three experimental groups would report higher behavioural intentions than the control group). Due to the lack of previous research bearing on this question, no predictions were made regarding which outcome classes might inspire stronger intentions to act. An interaction was anticipated between outcome condition and personal value orientation. Specifically, subjects exposed to a consistent outcome condition (e.g., economically-oriented subjects presented with the economic outcome description) were expected to report stronger behavioural intentions than subjects who received an inconsistent outcome description (e.g., economically-oriented subjects receiving the social outcome description).

Method

Design and Subjects

This experiment employed a 2 X 4 between-subjects factorial design, with high (n = 60) and low (n = 57) levels of self-efficacy, and three outcome conditions that made salient the rewards to be derived from the specific behaviour representing each class of outcome: economic (n = 31), social (n = 29), environmental (n =30), and a control condition (n = 27). These subjects were recruited from the population of respondents (n = 531) who completed the pre-test questionnaire. A total of 117 students participated in the experiment (over 80% of those contacted). The subjects ranged in age from 17 to 70, with an average age of 20. Seventy-one percent of the subjects were female and 29% were male. The experimental paradigm is typical of those used in verbal persuasion research (e.g. Maddux et al, 1986).

Stimulus Materials

Written communications were designed to manipulate the independent variables of self-efficacy and outcome expectancy. These communications were presented as part of a study sponsored by the fictitious UBC Department of Environmental Education to obtain opinions from students regarding several new workshops related to the environment that were supposedly being considered by the university. It was thought that this cover story would be accepted by the subjects and would control for possible demand characteristics that might bias subjects' responses. The material presented to each subject described, in detail, one new workshop, though subjects were given the impression that other workshops were also being evaluated. The workshop, entitled "Recycled Handmade Paper," described a 1/2 day course that would instruct participants on how to use low-tech, low budget methods of turning much of their household refuse into handmade paper products such as greeting cards, note pads, and writing paper. In addition, to alleviate any artistic biases in evaluations, the basic description indicated that no artistic ability or inclination would be needed to successfully use this technique.

More detailed information was then provided regarding the workshop to help the subjects evaluate their interest in it. The high self-efficacy description stated that the process taught in the course is easy to learn, requires no special tools, and is almost always successful ("over 90% of all past workshop participants report that they learned and regularly use the process with their waste material"). The low self-efficacy description stated that the process can be difficult to learn, requires some special tools, and is only sometimes successful ("only about 10% of all past workshop participants report that they learned and regularly use the process with their waste material").

It was presumed that subjects would perceive implicit in the title of the workshop a relation to the environment. Therefore, the objective of the outcome expectancy manipulation was to make salient a different outcome for each orientation. In the "economic" outcome expectancy condition, it was noted that using the technique is an efficient way to save money

(by making one's own paper products), avoid the hassles of stores, and also possibly earn money ("handmade paper is a highly valued product and can be sold for extra income"). In the "social" outcome condition, the social consequences of attending the workshop were emphasized. These included the ability to impress one's friends and family, and join others in helping the environment. In addition, it was noted that community leaders strongly endorse efforts to reduce waste, and encourage everyone to do their part. The "environmental" outcome condition noted the significant environmental benefits that can be gained by waste reduction and how this technique offered workshop participants the ability to help the environment. Although it was expected that all subjects would perceive the environmental benefits, it was thought that the environmental outcome description would increase subjects' expectancies regarding helping the environment. The lengths of the descriptions were all approximately equal.

Dependent Measures

The dependent measure and manipulation checks were assessed using a Workshop Evaluation Questionnaire. A check on the validity of the self-efficacy manipulation consisted of two items concerned with one's perceived ability to "learn" and "use" the handmade paper-making process. Subjects were asked to rate their agreement on a nine-point scale ranging from "strongly disagree" to "strongly agree" with the following statements: (a) "The process of making paper from waste materials would probably be easy for me to learn," and (b) "The process would probably be difficult for me to use" (reverse scored). These two items were combined into one efficacy scale ($r(117) = .57$). Channel efficacy was assessed using one item, which asked subjects about their accessibility to the workshop in terms of time considerations (i.e., whether or not they agreed or disagreed with the following statement, "Finding the time to attend this kind of workshop would be difficult for me.") The manipulation check for outcome expectancy consisted of three items that assessed the ability of the course participants to benefit themselves or the environment as specified by the three outcome conditions (i.e., save money, impress friends, and help the environment). For

example, the environmental outcome expectancy item asked subjects to indicate how strongly they agreed or disagreed with the statement "I can contribute to reducing environmental problems by taking this workshop and learning the paper-making technique." It was expected that subjects would identify the salient outcome (the one presented in their description) as more likely to be gained from taking the workshop than those of the other two types of outcomes. Outcome values specific to the workshop were also assessed with three items that asked subjects to rate the personal importance of each type of outcome to them (e.g., "How important is it to learn ways to better your economic situation?"). Each item was assessed on a nine-point Likert scale. In addition to serving as manipulation checks, these items represented continuous measures of these constructs, which were used as independent variables in correlational analyses.

The major dependent measure, intention to attend the workshop, was assessed with one item asking subjects to indicate their interest in taking the workshop along a 9-point continuum from "not at all interested" to "very interested."

Procedure

Subjects were recruited from the pre-test population based on their outcome value orientations so that each outcome expectancy condition contained approximately equal numbers of those with economic, social, universal, and mixed orientations. Under the procedure as previously outlined, four value groups were created: economic orientation (n = 31), social orientation (n = 23), universal orientation (n = 30), and mixed orientation (those subjects who did not score above one SD on any scale, n = 33). The different manipulations were randomly assigned within these groups.

Subjects were asked to report to a laboratory in the psychology building. When they arrived, they were informed that the psychology department had been asked by the UBC Department of Environmental Education to study students' opinions regarding some new workshops being considered. Each subject was handed an envelope which contained the description of one of the new workshops, and asked to read the description and complete the

accompanying questionnaire. This task was completed in a private room with no observers. After subjects completed the questionnaire, which took approximately 15 minutes, all materials were collected.

Results

Manipulation Checks

Self-efficacy. A main effect was found for the self-efficacy manipulation. Specifically, subjects in the high self-efficacy condition reported higher levels of self-efficacy than did the subjects in the low self-efficacy condition, $F(1,109) = 8.10$, $p < .01$ (Ms = 6.93 and 6.15, respectively). It is important to note that although the efficacy manipulation did influence subjects' beliefs of their capabilities of learning and using the paper-making process, no group differences were found for the measure of channel efficacy.

Outcome expectancy. A comparison among the three outcome conditions and the control group on each outcome manipulation check item revealed that only the economic manipulation seemed to work near expectations. A main effect was found for the economic manipulation check: subjects who read the economic outcome description indicated that they expected to accrue more economic outcomes if they attended the workshop than did subjects in the control condition, $F(3,109) = 2.67$, $p < .06$. Although subjects in the economic condition did indicate higher levels of economic outcome expectancy than subjects in the social and environmental outcome conditions, these differences were not significant. No differences were found for the social and environmental outcome expectancy manipulation checks. This pattern of results suggested that subjects were not swayed in their expectancies as a function of the manipulations. On average, subjects recognized that all three outcomes could result from the behaviour (means on all three scales were above the scale midpoint). Environmental benefits were seen as most likely ($M = 7.26$), economic benefits were second ($M = 6.38$), and social outcomes were the least expected ($M = 5.56$).

Outcome value and value orientation. A comparison of subjects' value orientations and their responses to the outcome value items revealed expected patterns of convergent

validity. Universally-oriented subjects reported a higher value placed on beneficial environmental outcomes ($\underline{M}$ = 8.10) than did the economic group [$\underline{M}$ = 7.29, $\underline{F}(3,101)$ = 2.92, $\underline{p} < .05$], although they did not significantly differ from the other two groups [$\underline{M}$(social) = 7.91; $\underline{M}$(mixed) = 7.61)]. Economically-oriented subjects reported a higher value placed on "saving money" ($\underline{M}$ = 8.16) than the other groups [$\underline{M}$(social) = 7.57, $\underline{M}$(universal) = 6.70, $\underline{M}$(mixed) = 7.21; $\underline{F}(3,101)$ = 5.52, $\underline{p} < .01$]. Finally, socially-oriented subjects reported a significantly higher value on social outcomes ($\underline{M}$ = 6.74) than universally-oriented subjects ($\underline{M}$ = 5.13), $\underline{F}(3,101)$ = 3.52, $\underline{p} < .02$. The ratings of socially-oriented subjects did not significantly differ from either the economic group ($\underline{M}$ = 6.52) or the mixed group ($\underline{M}$ = 6.39). These results provide additional support for the distinctions made among subjects regarding individual value orientations.

Experimental analyses

A 2 (efficacy) X 4 (outcome condition) X 4 (value orientation) Anova was performed on the behavioural intention item, yielding a main effect for self-efficacy, $\underline{F}(1,85)$ = 3.65, $\underline{p} < .06$, and no main effect for the outcome manipulations or for value orientation. As predicted, the high self-efficacy group reported stronger behavioural intentions than did the low self-efficacy group ($\underline{M}$s = 6.7 and 6.0, respectively). Although no significant main effects were found for outcome condition and value orientation, certain trends were observed. Subjects in the economic outcome condition reported somewhat higher behavioural intentions than all other groups including subjects in the environmental outcome condition - $\underline{M}$s = 6.74 (economic), 6.38 (social), 6.13 (environmental), and 6.15 (control). In addition, universally-oriented subjects reported the strongest intentions to perform the behaviour: $\underline{M}$ = 6.97 as compared to the other value orientation groups, $\underline{M}$ = 6.39 (economically-oriented), $\underline{M}$ = 6.30 (socially-oriented), and $\underline{M}$ = 5.91 (mixed orientation). No significant interaction effects were found.

Correlational analyses

As predicted, the behavioural intentions measure was correlated positively and significantly with self-efficacy, all three outcome expectancies, and outcome value pertaining to environmental outcomes, but not with the social or economic outcome value measures (see Table 1). In addition, channel efficacy and the pretest measures of general attitude and issue importance were positively correlated with behavioural intentions. Threat perception did not correlate with intentions to attend the workshop. A review of the intercorrelations among the predictor variables revealed some interesting results. Most intriguing was the low (marginally significant) correlation between self-efficacy and channel efficacy [$r(115) = .22$, $p < .05$], supporting the notion that these variables represent different constructs. In addition, no significant correlations were found between general attitudes and the efficacy and outcome expectancy constructs. General attitude was correlated with environmental outcome value [$r(115) = .34$, $p < .01$], but not with the other two outcome value domains.

In order to examine the unique variance explained by each factor, a simultaneous multiple regression analysis was performed. Results indicated that five factors accounted for the significant portion of the explained variance in behavioural intentions (see Table 1). As predicted, both efficacy beliefs explained unique variance, whereas only two of the three outcome expectancies explained significant levels of variance. These were economic outcome expectancies and environmental outcome expectancies. In addition, in an enigmatic result, threat perception accounted for a significant portion of explained variance. Contrary to predictions, expectancies regarding social outcomes did not significantly explain variance in behavioural intentions in the regression model. Consistent with expectations, no outcome value beliefs or attitudinal beliefs explained a significance amount of variance in the regression model. Overall, 54% of variance in behavioural intentions was explained [$R(109) = .74$] by the regression model.

Conclusions

This study assessed the multivariate association among the factors presented in the proposed framework as cognitive guides to behavioural intentions. In addition, it examined the effects of self-efficacy and different types of expected outcomes, by independently manipulating each construct. Self-efficacy was successfully manipulated and had a main effect on behavioural intention, adding to the evidence that supports the notion that self-efficacy has an important influence on behavioural intentions.

Only one outcome manipulation (i.e., economic) appeared to be effective in manipulating outcome expectations. This finding calls into question the strategy used in this study to manipulate outcome expectancies. No main effect was found for outcome expectancy; however, an interesting trend emerged. Specifically, subjects who received the economic outcome manipulation reported the strongest intentions to act. This finding highlights the importance of economic considerations when contemplating performing a behaviour directly involving environmental protection.

I predicted that subjects who received an outcome description consistent with their value orientation would report higher intentions to act. In fact, the interaction between outcome condition and value orientation was not significant in this study. This may be due to a lack of power as well as a result of ineffective manipulations. Further investigation is clearly needed to explore this hypothesis. One manner of effectively examining this phenomenon would be to isolate an outcome class and manipulate expectancies regarding that class into different levels across the different value orientations. This design would be more powerful in detecting the nature of the influence of a specific outcome class within each value grouping.

The correlational analyses in this study confirm a number of past findings, and offer some new possibilities regarding the factors that guide behavioural decisions. First, further support was found for the importance of self-efficacy and outcome expectancy as independent predictors of behavioural intentions. Second, support was found for the new construct of

channel efficacy as an independent source with which variance in intentions to act may be explained. Third, although the attitudinal factors did not account for any significant amount of explained variance in the regression procedures, their marginal but significant univariate correlations with the dependent variable provide evidence for their inclusion in the framework. Whereas the efficacy constructs and outcome expectancies combined to form the most parsimonious predictive model in this study, attitudinal factors are likely to be implicated in the decision process. Their influence, however, is likely to be minor when predicting intentions to perform any one specific behaviour.

In addition to these theoretical implications, the results found in this study have implications for the promotion of environmentally protective behaviour. They suggest that those interested in creating behavioural change should try to understand how individuals think regarding each behavioural guide, and subsequently focus their efforts on addressing those beliefs that may be blocking the desired action. In the environmental domain, where attitudes seem to be overwhelmingly pro-environmental (Gallup, 1990), current programs should attempt to increase levels of self-efficacy and channel efficacy regarding environmental action, as well as using economic incentives to motivate behaviour.

The results of Study 1 also support the importance of multivariate investigations of social behaviour. In particular, they begin to validate the utility of the proposed framework as a foundation from which researchers can investigate the influence of various factors as guides to social behaviours of interest. Whereas certain results were reasonably strong, others merely represented trends that require further study. Exploring some of these trends, particularly the influence of value orientations, will be a primary focus of Studies 2 and 3.

Chapter 7

Study 2: A focus on the role of values and economic motives in the domain of environmental behaviour

Overview

Study 2 was designed to address some of the ambiguous results found in Study 1. It employed the same procedures used in Study 1 with three important changes. First, in light of the inability to influence either the social or the environmental outcome expectancy in Study 1, the outcome expectancy manipulation in Study 2 focused solely on economic considerations. Specifically, economic outcome expectancies were manipulated into high and low conditions in order to more directly assess the influence that economic considerations have on an environmental behaviour. This methodological focus also allowed for a specific exploration of the interaction between value orientation and expectancies regarding this important motive. Expectancies regarding all three outcomes were still measured so that correlational analyses, which paralleled those in Study 1, could be performed.

Second, in response to the high correlation between channel efficacy and behavioural intentions found in Study 1, an attempt was made to examine the causal nature of this construct. Therefore, beliefs regarding channel efficacy were manipulated by altering the accessibility of the workshop into convenient and inconvenient conditions. The self-efficacy manipulation was retained to provide an opportunity to replicate the findings of Study 1.

The last change involved increasing the power of the experimental design. Two methods were used. First, the number of subjects per condition was increased. Second, the number of experimental groups was reduced. Thus, the outcome manipulation involved two groups rather than four, and only subjects who embraced a dominant value orientation were included in the study, thereby reducing the number of value groups from four to three.

Hypotheses

Main effects for all independently manipulated constructs were predicted. Specifically, higher levels on each variable, self-efficacy, channel efficacy, and economic

outcome expectancy, would be associated with stronger behavioural intentions. I expected that universally-oriented subjects would report higher intentions to take the workshop than economically-oriented subjects, and that the difference in behavioural intentions between high and low economic outcome expectancies would be greater for economically-oriented subjects than for universally-oriented subjects. In other words, it was anticipated that economically-oriented subjects would be significantly influenced by the economics of the situation, whereas universally-oriented subjects would not be influenced by the economic manipulation. A replication of the correlational results found in Study 1 was expected.

Method

Design and Subjects

This experiment employed a 2 X 2 X 2 between subjects factorial design, with high ($\underline{n}$ = 72) and low ($\underline{n}$ = 72) levels of self-efficacy, high ($\underline{n}$ = 73) and low ($\underline{n}$ = 71) levels of channel efficacy and high ($\underline{n}$ = 71) and low ($\underline{n}$ = 73) levels of economic outcome expectancy. Subjects were recruited from the population of Pre-test 2 respondents ($\underline{n}$ = 531) who correctly completed the questionnaire (a different subject population than used in Study 1). As in Study 1, the average age of the subjects was 20 with approximately 70% of the sample being female. Using the criteria as specified in Chapter 5, the sample was approximately equally divided among the three dominant value orientations: economic, $\underline{n}$ = 48; social, $\underline{n}$ = 47; universal, $\underline{n}$ = 49.

Stimulus Materials

Written communications were again used to manipulate the independent variables of self-efficacy, channel efficacy, and outcome expectancy, and were presented under the same guise as in Study 1. Self-efficacy was manipulated exactly as in Study 1. Beliefs regarding channel accessibility were manipulated through changing the location where the workshop would be held. The high channel efficacy group was informed that the workshop would be held on the university campus, whereas subjects in the low channel efficacy condition were

informed that the workshop would be located at a relatively distant off-campus location - though one that was still accessible to students by mass transportation.

With respect to the outcome manipulation, the high economic outcome expectancy condition group received the same description as presented in the economic outcome condition in Study 1. The communication for the low economic outcome condition also referred to the possibility of saving money, but in addition, stated "that using the (paper-making) process has its setup costs in terms of purchasing material and tools that you may not currently own." Emphasizing the potential costs was predicted to lower subjects' overall expectancies regarding the economic consequences from attending the workshop and using the paper-making process, while still appearing to be within reason. If the negative condition was perceived as too strong, skepticism regarding the intent of the study may have been raised in the subjects' minds, and this could have contaminated the results.

Dependent Measures

The dependent measures and manipulation checks remained the same as in Study 1, with the addition of a new measure of behavioural intention. This new measure asked subjects more directly, "If this workshop was offered later this year, how likely is it that you would attend?" This revision was intended to enhance the face validity of the dependent measure. Responses to this item were correlated $r(140) = .92$ with responses to the same item as used in Study 1. Clearly, no significant differences existed between these measures. Thus, all results described in this report are based on responses to the new behavioural measure.

Procedures

Recruitment and experimental procedures were identical to those used in Study 1.

Results

Manipulation Checks

Self-efficacy. The self-efficacy manipulation was successful in influencing self-efficacy beliefs. Subjects in the high condition ($M = 13.06$) reported higher efficacy beliefs

than subjects in the low condition (M = 11.36), F(120) = 10.4, p < .01. Channel efficacy beliefs and outcome expectancies were unaffected by this manipulation. Furthermore, no value differences were observed regarding self-efficacy beliefs.

Channel efficacy. The channel efficacy manipulation was not successful in altering perceptions of accessibility to the workshop. This may be due to the fact that many students live off campus at UBC and would actually have had equal access to the two workshop locations. Unfortunately, this possibility was not recognized at the time of the research.

Economic outcome expectancy. No main effect was found for economic outcome expectancies, but a very anomalous significant interaction was observed between the outcome manipulation and value orientations [F(120) = 3.3, p < .05]. As expected, economically-oriented and universally-oriented subjects in the high economic outcome condition (Ms for both = 6.25) reported higher expectancies than their counterparts in the low outcome condition (Ms = 5.21 and 5.6, respectively). Quite unexpectedly, the reverse pattern was observed for socially-oriented subjects. These subjects appeared to have greater economic outcome expectancies in the low condition (M = 6.5) than in the high condition (M = 5.64). None of these differences was significant at the p < .05 level, nevertheless the trend is a paradoxical finding.

Outcome value and value orientation. The consistency between subjects' general value orientations and the importance they ascribe to economic, social, and environmental outcomes as reported during the study was explored. As in Study 1, significant group differences were found for all three outcome value measures in expected directions [economic, F(120) = 7.02, p < .01; social, F(120) = 8.74, p < .01, and environmental, F(120) = 4.13, p < .02, see Table 2 for group comparisons]. Post-hoc analyses showed that economically-oriented subjects reported higher importance for economic outcomes than did universally-oriented or socially-oriented subjects. In contrast, universally-oriented subjects rated environmental outcomes as more important than did the other two value groups. Finally, socially-oriented

subjects rated social outcomes as more important than did universally-oriented subjects, but they did not differ from subjects with an economic value orientation.

Experimental Analyses

As predicted, a main effect was found for self-efficacy. Thus, subjects in the high self-efficacy group ($M = 5.82$) reported significantly higher intentions to attend the workshop than did subjects in the low efficacy group ($M = 4.94$), $F(120) = 4.83$, $p < .05$. No main effect was found for channel efficacy, probably due to the ineffective manipulation. In addition, no main effect was found for economic outcome expectancy, although there was a marginal outcome expectancy by value orientation interaction that will be described later. There were significant differences in behavioural intentions across the three value orientations [$F(120) = 4.37$, $p < .02$]. As anticipated, universally-oriented subjects reported the highest behavioural intentions ($M = 6.10$), followed by the socially-oriented group ($M = 5.34$) and the economically-oriented group ($M = 4.69$). Post-hoc comparisons revealed that only the universal value group and the economic value group differed significantly, $p < .05$.

A marginally significant trend was found for the interaction between value orientation and economic outcome condition [$F(120) = 2.16$, $p = .12$]. Planned post-hoc comparisons revealed, as predicted, that only economically-oriented subjects appeared to be significantly influenced by the manipulation (see Table 3). Thus, economically-oriented subjects in the high economic condition reported stronger intentions to attend the workshop than did economically-oriented subjects in the low economic outcome condition. In contrast, universally-oriented subjects were not influenced by the economic outcome manipulation. No significant differences were found for socially-oriented subjects.

Correlational Analyses

The correlational analyses in this study replicated the approach employed in Study 1. Consistent with hypotheses, expectancies regarding all three classes of outcomes and both self-efficacy and channel efficacy had significant univariate correlations with behavioural intentions (see Table 4). Once again, only a moderate correlation was found between self-

efficacy and channel efficacy [$r(140) = .29$, $p < .05$], confirming the relative independence of these constructs. Of the attitudinal variables, issue importance and threat perception showed small but significant correlations, whereas general attitude was not correlated with intentions to act. This pattern was slightly different than that observed in Study 1.

To isolate the unique contribution of each of these factors a simultaneous entry multiple regression analysis was performed (results shown in Table 4). Following the pattern found in Study 1, both efficacy variables and two of the three outcome expectancies accounted for significant variance in behavioural intentions. In contrast to the findings in Study 1, economic outcome expectancies did not remain significant in the regression model, whereas social outcome expectancies did account for a substantial portion of explained variance. This result shows the susceptibility of the regression procedure to slight changes in the correlations among the independent variables and the criterion. In all, 54% of the variance in behavioral intentions was explained, primarily by differences in efficacy beliefs and outcome expectancies.

Conclusions

Results confirm many of the findings from Study 1, and suggest some additional conclusions. Evidence supporting the importance of self-efficacy as a determinant of behavioural intentions was once again found. Although experimental results were compromised due to the ineffective manipulation, correlational analyses supported the independent role that beliefs regarding channel accessibility play in guiding behavioural decisions.

The influence of outcome expectancies and value orientations on behavioural intentions was much stronger in Study 2 than found in Study 1, both in terms of group differences and interactions between the two constructs. Universally-oriented subjects were clearly the most interested in performing the environmentally protective action, and were unaffected by contextual variations in economic outcome beliefs. In contrast, whereas economically-oriented subjects were least likely to report intentions to engage in the behaviour of interest,

their likelihood of performing the behaviour increased significantly when more beneficial economic outcomes were perceived. At present, the responses of socially-oriented subjects are difficult to understand. Nevertheless, based on the correlational evidence, expectancies regarding social outcomes do appear to be salient guides to subjects' behavioural decisions.

Perhaps the most interesting finding in this study is the involvement of personal values in these decisions. Personal value orientations seem to be directly involved in guiding behavioural decisions regarding the environment, as well as interacting with outcome expectancies to influence behavioural intentions. Whereas the role of attitudinal factors in these decisions is best described as indirect and inconsequential, deeply rooted convictions regarding personal desires are strongly implicated. These results suggest certain applied implications. It appears that people who embrace a universal value orientation will be predisposed to act in environmentally protective ways, probably because doing so satisfies their need to contribute to the ecological betterment of their world. In contrast, economic reinforcement is an important factor in prompting economically-oriented individuals to engage in environmentally protective behaviours. Social considerations appear to play a role in these decisions, but how they manifest themselves is uncertain.

In sum, results of Study 2 lend further support to the utility of the proposed framework as a valid research tool, particularly the influence of self-efficacy, outcome expectancies, and personal values on behavioural decisions. Attitudinal factors were found to be weakly and indirectly related to behavioural intentions. These findings are consistent with other research that has attempted to predict a specific behaviour from a general attitude. Of the three attitudinal factors, the attitude importance construct seemed most implicated.

Chapter 8

Study 3: Exploring how values guide behavioural decisions in ecological dilemmas

Overview

In the first two studies, the framework was shown to be useful in explaining and predicting intentions to perform one specific environmentally protective behaviour. Two groupings of predictors, efficacy and outcome expectancies, accounted for the most variance in behavioural intentions, whereas personal values were also implicated in these decisions. Study 3 investigated more thoroughly the influence of such values in different behavioural decisions regarding the environment. Exploring the interaction between personal values and the specified domains of outcome expectancies was of particular interest.

Specifically, the goal of this study was to ascertain how individuals react when placed in hypothetical situations of personal ecological conflict, and to determine which behavioural guides account for variance in their responses. Motivated by the often noted suggestion that current ecological problems are a result of a "crisis" in human values (e.g., Armstrong, 1972, Milbrath, 1986), a secondary focus of this research was to determine how personal values are implicated in important and controversial ecological behavioural decisions. Several issues were addressed with respect to this objective: (1) how might individual differences in the weight placed on different values affect decisions regarding environmental preservation - particularly when preservation is in conflict with other personal desires; (2) how might different contexts, in terms of personal economic and social circumstances and/or outcome expectancies, influence individual choice, and (3) how might attitudinal factors be involved in these decisions?

To examine these issues, three hypothetical dilemmas involving ecological issues were developed. The use of hypothetical scenarios in research examining psychological processes has a long and productive history, particularly in the area of moral development and behaviour (e.g., Forsyth, 1985; Kirtines, 1986, Kohlberg, 1958) and decision-making (e.g., Tversky & Kahneman, 1981). They can present diverse settings in which subjects can be

called upon to make decisions in a format conducive to empirical examination. It was therefore reasoned that this methodology would be appropriate for the purposes of the present study.

The scenarios were developed based on two guidelines. First, the situations were presented in very simple terms, providing only a limited amount of detail. Describing the dilemmas in this manner required subjects to rely on their own beliefs and values as the primary bases for their responses. Second, the scenarios represented dilemmas that to some extent model actual situations that people and/or communities may actually encounter.

The first scenario described a variant of the "Commons" dilemma (Hardin, 1968). A rancher has to decide how to act when a short-term economic gain can be obtained, but at the cost of neglecting commitment to the other ranchers who share common grazing land and possibly contributing to the irreversible depletion of the shared resource. A second situation (termed the "Harvest" scenario) models the conflict faced by many timber communities. It presents the choice between economic rewards (i.e., employment) and environmental preservation (preventing the harvesting of old-growth trees). The third scenario (referred to as the "Waste" scenario) represents the real-life problem of waste management. It asks people to decide between two methods of waste management, one that is considered more environmentally protective (intensive recycling) versus one that ignores the mounting waste problem, but would be less intrusive into people's lives.

Each scenario pits economic motivations against those of environmental preservation and protection, while also examining the role that social outcome factors play in decision-making. In order to test the causal relation between these motives and individual choice, two versions of each scenario were examined. In one version, the scenario described a situation where the choice in favor of economic gain was in direct conflict with the environmentally protective choice. In addition, in two of the three dilemmas social pressures were described that supported the "economic" decision. This manipulation was included in order to explore subjects' responses to social influences. No social influence manipulation was included in the

Waste dilemma, because the scenario was thought to be too personally relevant for a hypothetical social influence intervention to have an effect. In contrast, the other version presented a situation where economics should only factor minimally into one's decision and no social barriers were placed in conflict with the environmentally-responsible choice.

The goal of the manipulation was to create a high level of conflict between ecological goals and other motivations in one condition, and low conflict in the other condition. For this reason, economic and social influence pressures were combined in order to maximize the potential for conflict. For example, in the high conflict version of the Commons dilemma scenario, the rancher owns a small ranch, is in significant economic need, and has no social ties to the other ranchers who share the common grazing land. In the low conflict version, the rancher owns one of the larger ranches, is doing quite well economically, and is friends with the other ranchers. It should be noted that the social manipulation addressed the influence that important others may have on people's decisions, and not the perceived social benevolence of the situation. A social benevolence interpretation of each scenario would lead to specific predictions independent of the social influence manipulation. As it turned out, the social influence manipulation seemed to be greatly overshadowed by the responses to the economic manipulation. Thus, I refer to the experimental manipulation in terms of the conflict between the economic and environmental interests.

Hypotheses

Four primary hypotheses were tested in this study:

1. Subjects' value orientations will significantly influence their decisions in each scenario. Specifically, I predict that economically-oriented subjects will be more likely to select the economically-responsible option while universally-oriented subjects will tend to choose the environmentally-protective option. This pattern will be observed in all three dilemmas. The decisions of socially-oriented subjects will vary. In the Commons scenario, socially-oriented subjects will select the environmentally protective option primarily because of the implied social contract between the ranchers. In the Harvest scenario, they will

respond in the economically responsible manner because this option will be perceived as offering the greatest good for the greatest amount of people. No predictions were made regarding this group and the Waste scenario.

2. Whereas the experimental manipulations (particularly the economic situation) may have a main effect on subjects' behavioural intentions, it will be the interaction between the context and individual value orientations that is of interest. It is expected that the different contexts will interact with subjects' value orientations to influence their decisions. Thus, universally-oriented subjects will not be influenced by changes in economic need or by any social pressures (the experimental manipulations), whereas economically-oriented subjects will be influenced by the changes in economic situation. Although it is presumed that socially-oriented subjects will be influenced by personal social pressures inherent in a situation, this manipulation was considered exploratory and not much confidence was held in manipulating these pressures. Therefore, specific hypotheses regarding its influence were not offered.

3. It is expected that motives that represent all three value orientations will be reported and rated as important. However, strong value differences in the extent to which these motives are reported as influential should be found. Thus, the economically-oriented subjects will emphasize economic need and their right to economic gain as central to their decisions, the socially-oriented will report social benevolence and social influence factors as guiding their decisions, and the universally-oriented subjects will rate ecological concerns, as well as adhering to one's core values, as most important.

4. A moderate relation between attitudinal factors (i.e., general attitude and issue importance) and behavioural decisions is expected, especially in the Harvest and Waste decisions. This expectation is partly due to the high degree of relevance of attitudes toward the environment and the issues presented in these scenarios, issues perceived as more relevant to attitudes than the criterion in the previous two studies. No attitude-behavioural intention relation is expected in the Commons dilemma decision. It is believed that the economic and

social aspects implicated in this particular dilemma will overshadow any potential influence that attitudes may have in guiding responses.

The methods employed in this study also allowed for an examination of certain hypotheses regarding the experience of cognitive dissonance. It was presumed that the dilemmas would create a certain amount of internal value conflict within each decision-maker. This conflict would be experienced differently based on the value system embraced by the subject and the scenario in which she or he was placed. In general, it was anticipated that subjects would experience more conflict when positive environmental outcomes were paired with negative economic outcomes than when they were not. In addition, it was hypothesized that subjects who make a value-consistent decision will report less inner conflict than will subjects who select a value-inconsistent option. So, economically-oriented subjects will report more conflict when they chose the environmentally-protective option, thereby passing up an economic opportunity. In contrast, both universally-oriented and socially-oriented subjects would report more conflict when they chose the option that was not consistent with environmental protection.

Method

Experimental Design and Subjects

This experiment employed a 2 X 3 mixed factorial design, in which high (n = 72) and low (n = 72) levels of economic-ecological conflict were presented to subjects representing the three value orientations - economic (n = 48), social (n = 47), and universal (n = 49) for each of three hypothetical situations. The subjects recruited for Study 2 were employed as participants for this study as well. Subjects were informed that the two studies were part of different and unrelated research programs.

Stimulus Materials

Subjects were administered questionnaires containing descriptions of all three hypothetical ecological dilemmas. The "Commons" dilemma described a situation encountered by a rancher who shares a common grazing land with nine other ranchers.

Specifically, the dilemma was described as follows: (Note: bracketed sentences represent the manipulations where the high conflict condition is described first and the low conflict is described second.)

> "Bill shares a common area of grazing land with nine other ranchers. [Though all the ranchers are business associates, they rarely socialize and are not really friends with each other]/[As well as being business associates, all the ranchers are friends]. All the ranchers know that the common grazing land is the perfect size for the total amount of cattle that they collectively own. Any more cattle would overuse the grazing land, and if all the ranchers bought extra cattle the land would be ruined. The ranchers have an "unwritten" commitment not to overuse the common grazing land. Bill comes across a special deal where he can purchase a number of additional cattle for a very low price. [Bill owns one of the smaller ranches and has been hurt by the bad economic times.]/[Bill owns one of the larger ranches and has actually done well financially even during the bad economic times.] He knows he would be violating the ranchers' agreement, but he plans to keep the new cattle for only a short time. Then everything would return to normal.

In the Harvest Dilemma, a woman who lives in a small town in British Columbia is faced with a decision of whether or not to try to prevent the harvesting of a large area of old growth forest near her home. This dilemma read as follows:

> "Jane has lived in a small town in British Columbia all her life. The main source of jobs in the town is the local lumber company. Jane has found out that the company is planning to harvest a large area of old growth forest land which the company owns, that up until recently has been set aside as parkland. It's been a slow period for the town and this new project means jobs and income for a number of years. [Most of Jane's friends and previous co-workers are very excited about the new harvest, and want to see the project happen. Both Jane and her husband were recently laid off by the company and will be rehired when this new harvest begins.]/[Most of Jane's friends are very concerned about the new project, and are troubled by the harvesting of old growth forest land. Although the harvest does mean jobs for many people in the town, both she and her husband already have well paying jobs and would be unaffected by the new project.] She has heard that old growth forests can't be regenerated and the current ecosystem would be severely damaged."

The third dilemma dealt with the current problem many communities face regarding waste disposal. This dilemma was described as follows:

> Tom and Mary live on the outskirts of a medium size city. The regional area has a growing problem with what to do with its garbage. The landfill site is almost at capacity. The local governmental department of waste management has developed two proposals to deal with this situation. The first is to build a second landfill site. The best location for the new site is an area currently designated to be a new park. [The land already belongs to the regional district and no new fees would be required under this proposal.]/[This

proposal would result in the residents of the greater regional area being charged with a monthly fee for garbage collection specifically to pay for the new site.] The second proposal would involve creating a new collection system that would force all people to separate their garbage into seven categories - six for recycling and one for composting. Containers would be provided by the waste department and substantial fines would be charged to anyone who doesn't abide by the new regulations. [Additionally, the residents of the greater regional area would be charged with a monthly fee in order to pay for the added costs necessary to run this waste collection system.]/[No new fees would be required under this system.] The government is planning to hold a public vote on this issue next week.

Dependent Measures

After reading each scenario, subjects responded to four sets of issues. First, they indicated what behavioural decision they would make if they were in that situation. For the "Commons" dilemma, this meant either purchasing or not purchasing the additional cattle. For the Harvest dilemma, subjects had to choose between "actively" supporting the harvest and "actively" opposing the harvest. For the Waste dilemma, the choice was between voting for building the new landfill or voting for creating the new collection system. Second, immediately following their decisions, subjects were asked to rate how much conflict they would feel if they were in that situation on a 7-point scale ranging from "no conflict" to "a lot of conflict."

Third, subjects were asked to "describe," in an open-response format, the factors that influenced their decision . Subjects were prompted to list all the factors that they thought were important. This procedure was employed in order to let the subjects indicate the reasons that influenced their decisions without prompting from the experimenter. Responses from 20 subjects were coded by two independent raters, and general categories were identified. Reliability for the three dilemmas was: (a) Commons: 91.4%, (b) Harvest: 91.2%, and (c) Waste: 94%. Once reliability was established and disagreements were resolved, one rater coded the remaining data.

Fourth, for each of the three dilemmas subjects were asked to rate how important each of twelve reasons (found through pilot testing to be implicated in guiding people's decisions) were in making their decisions. These ratings were made on 5-point scales, which ranged from "no importance" to "great importance." Included were items that represented aspects of

each of the three value domains. Examples of items used for the Commons dilemma are: "Your short term financial needs," "Whether the rights of the other ranchers would be violated," and "Whether purchasing the cattle violates one's moral or ethical code." Examples from the Harvest dilemma are: "How the decision would affect your family's financial situation," "One's relationship with the townspeople," and "What the costs to the environment would be." Examples from the Waste dilemma are: "Your ability to pay the new fee," "Which proposal is supported by your friends and family," and "How each proposal would affect the environment." Finally, from this list of twelve reasons subjects were asked to rank one as "most important" in making their decision.

Procedure

Participating subjects were instructed to read each scenario, and then complete the questionnaire that followed. By random assignment, the Commons scenario was always presented first, followed by the Harvest scenario, and then the Waste scenario. The experimental conditions were counterbalanced, resulting in eight possible groupings (i.e., high or low conflict in the Commons scenario, high or low conflict in the Harvest scenario, and high or low conflict in the Waste scenario). No order effects were found. When subjects completed all three scenarios, they returned their completed questionnaires, and were fully debriefed as to the intent of the study.

Results

Across conditions and subjects, there was a strong tendency to select the environmentally protective options. In the Commons dilemma, 82% of the sample reported that they would not purchase the cattle, while 18% indicated they would accept the "special deal." The responses to the Harvest dilemma were more balanced. Sixty-four percent of the sample indicated that they would actively oppose the harvest, while 36% supported the harvest. Overwhelming support for the recycling option was found in the Waste dilemma (91%), whereas only 9% of the sample decided to vote for the new landfill.

Influence of Value Orientations

Table 5 presents the percentage of subjects that selected the environmentally protective option for each value orientation. Significant value differences were found for both the Commons ($X^2 = 6.05$, $p < .05$) and Harvest dilemmas ($X^2 = 15.1$, $p < .001$). Planned comparisons among the three groups revealed patterns consistent with the first hypothesis. Thus, universally-oriented subjects were more likely to report that they would engage in the environmentally protective option than were subjects with an economic orientation. This occurred in both the Commons dilemma and in the Harvest dilemma.

Also as predicted, the responses of socially-oriented subjects varied as a function of the social benevolence aspects of the dilemmas. In the Commons scenario, they selected the environmentally-protective option (as did the universally-oriented subjects) at a significantly higher rate than did the economically-oriented subjects. In contrast, their responses paralleled the economically-oriented subjects in the Harvest dilemma, selecting the environmentally-protective option less often than did the universally-oriented subjects. Although not significant, the results for the Waste dilemma did show a trend similar to the findings in the Commons dilemma, where socially-oriented and universally-oriented subjects favored the environmentally protective action more than did economically-oriented subjects.

Effects of Manipulations

The only significant manipulation effect was found in the Waste dilemma, where the environmentally-protective option (recycling) was supported less (85% compared to 97%) when it was associated with the additional economic cost ($X^2 = 5.29$, $p < .02$). Subjects also supported the economically-advantageous option somewhat more often in the high conflict condition than in the low conflict condition of the other two dilemmas (22% to 14% in the Commons dilemma; 42% to 30% in the Harvest dilemma), but the differences were not statistically significant.

Of greater interest was the interaction between the experimental manipulations and the value groupings. Table 6 presents the results of these analyses. Although only the Harvest

dilemma yielded a significant interaction ($\underline{X}^2 = 6.75$, $\underline{p} < .01$), a similar pattern could be observed in all three dilemmas. Thus, as predicted, it was found that economically-oriented subjects were influenced by the contextual manipulations, whereas universally-oriented and socially-oriented subjects were not influenced by these manipulations. This interaction was particularly strong in the Harvest dilemma, where 29.2% of economically-oriented subjects supported preserving the forest in the high conflict condition, whereas 70.8% supported the preservation option in the low conflict condition. Clearly, the economically-oriented subjects were substantially influenced by the personal economic need factor, whereas the subjects embracing a different value orientation were not. The underlying justifications for subjects' decisions are discussed in the next section.

Underlying Motives

In general, the motives that subjects described as important and as influencing their decisions were consistent with their value orientations. The relation between underlying motives and value orientations was assessed in three ways. Responses to the open-ended question were explored first, using a content analysis approach to determine global categories of reasons for each dilemma. From these data, I examined individual value differences in terms of the frequency with which certain motives were reported.

Next, comparisons among value orientations were conducted on the 12 importance ratings presented to the subjects. These analyses were performed for each dilemma independently, using 3-way Anovas with condition, value orientation, and decision as the independent factors, and the rating of each reason as the dependent factor. Because the focus of this study is on the role that value orientation plays in these decisions, only differences regarding value orientation are reported. When overall significant differences were observed, Tukey's HSD tests were used to determine specific differences between individual groups.

Last, value differences in the ranking of the "most important" factor influencing subjects' decisions were explored. For these analyses, individual factors were grouped into three categories that directly paralleled the three motivational domains (i.e., economic, social,

universal). Each category was comprised of two, three, or four individual reasons. Once categorized, the percentages of subjects that ranked the motives in a category as most important were compared across the three value orientations.

Open-ended responses. For the Commons dilemma, seven categories of motives were found. The two most often cited reasons were "economic considerations" (e.g., personal financial need) and "social considerations" (e.g., effect on other ranchers) with 74.5% of the sample in each case reporting the factor as important in influencing their decisions. The next most reported factor (50% of the subjects) was adhering to "the agreement" not to graze any more cattle. The other four reasons given were: (a) the "effect on the environment" (47%), (b) "moral considerations" (i.e., subject must have specifically referred to "moral," "ethical," or personal "principles" as influencing their decision - 20%), (c) "general future considerations" (i.e., with respect to no specific outcome of concern - 10%), and (d) "not getting caught" (2.8%). Counter to expectations, the pattern of responding in this dilemma did not significantly differ across value orientations. One marginal difference was found for "economic considerations", where economically-oriented subjects (85.4%) reported this concern more often than did socially-oriented (63.8%) or universally-oriented subjects [(73.5%), ($\underline{X}^2 = 5.82$, $\underline{p} < .06$)].

In the Harvest dilemma, eight categories of motives were identified. Here the most cited factor was "damage to the ecosystem" (e.g., harvesting the old-growth forest would destroy the ecosystem) with 63.4% of the subjects reporting this influence. The other categories in order of reporting were: "economic needs of the community" (43.4%), "personal economic need" (35.9%), "general harvest considerations" (e.g., can the harvest be altered in some way - 29.7%), "personal social considerations" (e.g., what friends think - 13.1%), "possibility of finding jobs elsewhere" (16.6%), "forests are a renewable resource" (6.2%), and "moral considerations" (4.1%).

Value differences, in expected patterns, were found regarding two factors underlying subjects' decisions in this dilemma. Universally-oriented subjects listed "damage to the

ecosystem" (75.5%) more often than did socially-oriented (66%) and economically-oriented (47.9%) subjects ($X^2 = 8.17$, $p < .02$). As would be expected, this pattern was reversed for "personal economic considerations." Whereas 47.9% of economically-oriented subjects listed this as an important factor, only 36.2% of socially-oriented subjects and 24.5% of universally-oriented subjects reported this factor as influencing their decision ($X^2 = 5.77$, $p < .06$).

Nine categories of reasons were described as influencing subjects' decisions in the Waste dilemma. The most often cited reason was "economic considerations" with 62.8% of the subjects listing this concern. This motive was closely followed by "effect on the environment" where 53.8% of the sample reported this outcome as important in guiding their decision. The other seven reasons were as follows: (a) "importance of the community park" (33.8%), (b) "landfill only a temporary solution" (31%), (c) "promote recycling" (28.3%), (d) "recycling not difficult to do" (e.g., does not take a lot of time - 25.5%), (e) "social considerations" (9.0%), (f) "recycling too difficult to do" (e.g., takes too much time - 6.9%), and (g) moral considerations (6.9%). Two areas of value differences were found. First, universally-oriented (59.2%) and socially-oriented (66%) subjects listed "effect on the environment," whereas only 37.5% of the economically-oriented subjects did so ($X^2 = 8.5$, $p < .02$). Similarly, universally-oriented (38.8%) and socially-oriented (42.6%) subjects were more likely to refer to the importance of the park than economically-oriented subjects (18.8%; $X^2 = 7.05$, $p < .05$).

Importance Ratings. Substantial support for the third hypothesis was found when differences in importance ratings were examined for each of three dilemmas. In the Commons Dilemma (see Table 7), economically-oriented subjects rated "short-term financial needs" as more important than did socially-oriented and universally-oriented subjects, $F(129) = 4.71$, $p < .001$. In contrast, socially-oriented subjects rated "the relationship one has with the other ranchers," $F(131) = 6.71$, $p < .002$, and "what one's family thinks" $F(130) = 4.02$, $p < .05$, as more important than both economically-oriented and universally-oriented

subjects. In addition, socially-oriented subjects rated "Whether the rights of the other ranchers would be violated" and "How much purchasing the cattle could hurt the other ranchers financially" as more important than did economically-oriented subjects, but the socially-oriented subjects did not differ from universally-oriented subjects on these reasons, $F(130) = 8.14$, $p < .001$; $F(129) = 4.07$, $p < .05$, respectively. Universally-oriented subjects rated "adhering to one's core principles" as substantially more important than did economically-oriented subjects and marginally more important than socially-oriented subjects, $F(131) = 8.01$, $p < .01$. Furthermore, universally-oriented subjects rated the importance of moral and ethical considerations as more important than did economically-oriented subjects, $F(131) = 9.21$, $p < .001$. Various other significant and non-significant comparisons followed this pattern.

Consistency between motives and value orientations was found when the importance ratings were examined for the Harvest decision (see Table 8). In this case, economically-oriented subjects rated "How the decision would affect your family's financial situation" as more important than did socially-oriented and universally-oriented subjects, $F(130) = 8.02$, $p < .01$. In contrast, universally-oriented subjects rated the importance of "What the costs to the environment would be" as significantly higher than economically-oriented subjects, and marginally higher than socially-oriented subjects, $F(130) = 3.74$, $p < .05$. In addition, socially-oriented subjects rated "One's relationship with the townspeople" as significantly more important than did economically-oriented and universally-oriented subjects, $F(129) = 2.54$, $p = .08$. No other significant differences were observed.

A similar pattern of responses was found in the Waste Dilemma (see Table 9). Economically-oriented and socially-oriented subjects rated "how much each proposal will cost the residents of the community" as more important than did universally-oriented subjects, $F(131) = 3.55$, $p < .05$. In contrast, universally-oriented subjects rated "adhering to core principles related to the decision," $F(131) = 5.67$, $p < .01$, and "how each proposal would affect the environment," $F(132) = 4.5$, $p < .02$, as significantly more important than did

economically-oriented subjects and marginally, but not significantly, more than did socially-oriented subjects.

"Most important" ratings. Further support for these value differences was found in the subjects' rankings of the "most" important reason (see Table 10). In all three dilemmas, economically-oriented subjects ranked economic factors as "most important" in guiding their decisions significantly more often than did socially-oriented and universally-oriented subjects in all three dilemmas. Socially-oriented subjects ranked social factors as "most important" more often than did economically-oriented and universally-oriented subjects in both the Commons and Harvest dilemmas, but not in the Waste dilemma. Finally, as was anticipated, universalistic (e.g., protecting the environment, adhering to core values) factors were ranked as most important by a great majority of universally-oriented subjects in all three dilemmas. These percentages were significantly higher than the percentages of economically-oriented and socially-oriented subjects who did so.

Attitudes, values, and behavioural decisions

The attitude-behavioural decision relation was analyzed independently for each dilemma. As predicted, both general attitude ($r = .35$, $p < .05$) and issue importance ($r = .37$, $p < .05$) were significantly predictive of decisions in the Harvest dilemma, however neither was significantly correlated with decisions in the Commons dilemma. Contrary to predictions, no relation existed between either attitudinal factor and behavioural decisions in the Waste dilemma.

To explore more fully the different contributions made by attitudinal factors and values in accounting for variance in behavioural decisions, a simultaneous entry multiple regression procedure was employed to analyze the Harvest dilemma decision, the only scenario where attitudes were implicated. In addition to including both attitudinal variables in the regression model, five other independent constructs were included. These were: (a) a variable that represented the different outcome conditions from which the decision was made; (b) two variables that reflected the differences found between value groups; and (c) two variables that

represented the interaction between values and the outcome manipulation. Coding methods outlined by Cohen (1968) were used to include these variables in the regression model.

Results from this analysis showed that each independent factor accounted for a significant portion of explained variance (see Table 11). Overall, 29% of variance in the behavioural decision was explained [$F(131) = 9.06$, $p < .001$]. Personal values accounted for 16.4% of variance in the Harvest decision. Regression analyses performed on the decisions made in the other two dilemmas found no single factor or group of factors able to explain a significant portion of variance.

Conflict analyses

Overall, the highest degree of conflict was reported in response to the Harvest dilemma ($M = 4.73$), the Commons dilemma was second ($M = 4.41$), and the least amount of conflict was reported in response to the Waste dilemma ($M = 3.11$). In two of the three dilemmas, more conflict was reported in the high conflict condition than in the low conflict condition (see Table 12). Specifically, more conflict was reported by subjects when economic need was high in the Commons dilemma and by subjects in the Waste dilemma when economic outcomes were in conflict with the environmentally protective option (i.e., recycling would cost more money). No difference was found in response to the Harvest dilemma.

When the interaction between subjects' value orientations and their behavioural decisions was compared in terms of the level of conflict experienced, trends were found that followed predictions in two of the three dilemmas (see Table 13). No differences were observed in the Commons dilemma and, therefore, specific results are not reported. In the Harvest dilemma, a marginal overall interaction was found [$F(131) = 2.91$, $p < .06$]. Post-hoc analyses showed a trend consistent with expectations. Specifically, it was found that economically-oriented subjects reported higher levels of conflict when they chose to preserve the forest, the value inconsistent option, than when they chose the harvest option, $t(131) = 1.64$, $p < .10$. In contrast, socially-oriented subjects reported more conflict when they chose

to harvest than when they decided to preserve, although this difference did not approach significance. No difference was found for universally-oriented subjects.

In the Waste dilemma, a similar trend was found, $\underline{F}(131) = 3.38$, $\underline{p} < .05$. Economically-oriented subjects felt more conflict when they chose the recycling option than when they endorsed building the new landfill. In contrast, both universally-oriented and socially-oriented subjects reported more conflict when they chose the landfill option.

Although these results are intriguing, for the most part they represent only trends, and are based on very small cell sizes in certain groups. Therefore, care should be taken in drawing conclusions from these findings. Nevertheless, the results suggest that the experience of dissonance and its motivational influence on behaviour is associated with one's value orientation. Research that focuses on this interaction, as well as on the relation between cognitive dissonance and environmental decision-making, is warranted.

Conclusion

Clearly, value orientations play a key role in guiding individuals' decisions regarding ecological issues. Although people recognize, and are motivated by, needs and desires consistent with all three motivational domains, when a dominant value orientation is embraced, it is likely to have the greatest influence on an individual's thinking and behavioural decisions. In addition, personal values may influence the way in which psychological motivations, such as cognitive dissonance, manifest themselves.

Whereas strong relations between personal values and behavioural decisions were found, the relation between attitudes and behavioural decisions was less reliable. A significant relation between attitudes and behavioural decisions may exist, but this appears to be the exception rather than the rule. Thus, in the Harvest dilemma, the constructs of general attitude and issue importance appeared to play significant roles in guiding subjects' harvest decisions. In contrast, these factors were not found to be associated with decisions in the other two dilemmas. It may be the case that certain issues are more attitudinally salient than others. In this study, the issue of forest preservation may have activated subjects' attitudes

toward environmental preservation more so than the other two issues. These findings may also be explained by the skewed results in the Commons and Waste dilemmas, where a disproportionate percentage of subjects favoured the environmentally protective option (the percentages were more balanced in the Harvest dilemma). I suspect that in the real-world a higher percentage of people would endorse the economically advantageous option. If that were the case, attitudinal factors may be useful in accounting for variance in behavioural decisions. Therefore, it is argued that general attitudes should be included in a multivariate model of social behaviour and decision-making.

In addition to these theoretical implications, the results of Study 3 have implications regarding confronting current ecological dilemmas. Although a "crisis" in values may not be responsible for all our environmental troubles, personal value systems do influence behavioural choice regarding these issues. For example, when environmental preservation and economic outcomes are in conflict, economically-oriented people will be more biased in favour of pursuing the economically-advantageous course of action than will people who have different value orientations. As Merchant (1992) suggests, this may stem from a belief that if each individual attempts to maximize personal economic outcomes, the society as a whole will benefit. Adherents to this value orientation probably consider it their right to pursue economic goals, a right central to the effective functioning of society, and believe that enlightened self-interest will guide us to a sustainable future.

In contrast, socially-oriented individuals appear to place the needs of the many before the needs of any one individual or the natural environment. They seek maximum benefit for the maximum number of people - a goal consistent with a highly valued desire for personal connection with others. These pursuits are directed towards satisfying the needs of other people, and are not necessarily consistent with preventing ecological problems. People adhering to this value orientation will be most likely to support ecological preservation when it is socially optimal to do so (in terms of personal and/or societal rewards), as seen in subjects' responses to the Commons dilemma. They may also support an economically-

advantageous course of action when it is perceived to present more beneficial outcomes for more people, as was observed in responses to the Harvest dilemma. For socially-oriented people, their sense of social need, as well as their desire for personal social connection, serve as the underlying motives on which they base their decisions in ecological dilemmas.

The group most likely to ardently pursue environmental preservation, even when negative economic and/or social outcomes may result, are those who have developed a universal value orientation. These people seek internal satisfaction from knowing they contributed to resolving important societal/global concerns. In terms of ecological concern, they appear to be predisposed to protecting the natural world more consistently than individuals who embrace the other two value orientations, even when it means personal sacrifice.

Our society has strong ties to an economic system that promotes the maximization of personal economic outcomes as a desired (and respected) end. Many people's judgements regarding the appropriateness of their actions are rooted in this system, leading them to adopt a value system dominated by economic motives - a value system, as we observed in this study, that will often conflict with ecological goals. Although this system may not necessarily impede a harmonious relation with the natural environment, a basic conflict does appear to exist.

The question arises as to how society can most effectively resolve this conflict. One approach contends that although a paradigm shift in personal values (i.e., toward a universal value orientation) may be most effectual in achieving preservation of the natural world, this shift is not likely to occur in the near future. Rather than approaching ecological problems from the position that human values are in "crisis," it may be more efficacious to develop a better understanding of the psychology that motivates decisions regarding these matters. Therefore, an initial step towards resolving ecological dilemmas would be a genuine recognition of the various interests (motives) involved in such dilemmas and acceptance of those interests as legitimate by all involved parties. From this understanding, resolutions can

be sought through open and respectful communication between the various interests. An approach to resolving ecological dilemmas which is sensitive to, and respectful of, the competing interests (and personal values) involved is necessary to create a livable balance among the various needs at stake. This approach necessarily places a high level of confidence in the notion of "enlightened self-interest" (i.e., that once environmental hazards are recognized, people would be motivated to ameliorate them, for it would be in their interest to do so). There are notable examples where enlightened self-interest has alerted people to potentially destructive practices (e.g., recognition of the effects of chloroflorocarbons on the ozone shield has led to a reduced use of products containing this gas).

However, in light of psychology's research on behaviour in Commons type dilemmas (see Plous, 1993 for review), this enlightened self-interest approach may not be enough. A primary feature of a Commons dilemma is the inability of those involved to recognize the broader, collective negative implications of their actions. As Plous (1993) has recently noted, "certain collective traps, such as those involving ... environmental degradation...have a disturbing air of permanence, and it remains to be seen whether humanity will be able to solve them" (p. 251). Even if collective concerns are noted by a majority of people, the results of the present study imply that only individuals who are guided by a universal value orientation and who adhere to society's present normative ideal regarding environmental protection will be consistently willing to incur personal sacrifice in order to protect the natural world.

Two limitations of this research deserve comment. First, the restricted nature of the sample (i.e., students) impedes generalizing the findings to the community at large, particularly with respect to the descriptive results. Reactions to these scenarios could vary systematically depending on the population that is being sampled. Second, hypothetical situations were used to elicit responses. Certainly, additional pressures would be felt if these decisions needed to be made in real life, pressures that may alter they way an individual would respond. The students in the sample most likely have not had to contend with these specific situations. Therefore, their responses may lack insight into the true dynamics of the

described situations. Nevertheless, the importance of values in guiding ecological choice has been demonstrated. Future research could aim at clarifying trends found in this study by exploring these important issues with a broader and more diverse sample, and in actual field settings.

Chapter 9

Summary and Conclusions

A primary goal of this thesis was to integrate, clarify, and expand upon social psychological theory that attempts to describe the beliefs, desires, and personal values that influence social behavioural decisions. Pursuing this theoretical objective is important in light of the many problems that modern society faces, problems that directly stem from individual human beliefs and activity. These predicaments include, but are not limited to, health concerns such as the spread of AIDS, economic difficulties that create higher levels of poverty, hunger, homelessness, prejudice and discrimination, and the primary focus of the present course of research, environmental destruction. Resolution of most, if not all, of these problems involves understanding the ways individuals think, feel, and act regarding issues of social concern.

The current research highlights the multifaceted and complex nature of decision-making regarding social behaviour. Much human behaviour involves planned reactions to specific circumstances. Thus, behavioural decisions are usually motivated by a complex array of factors including beliefs about one's world, beliefs about oneself, as well as individual desires and needs. Although one factor may dominate the behavioural decision in any one situation, it is understanding the diversity and complexity among these many factors that will enable social scientists to account most effectively for the variety of behaviour exhibited in important social situations. The framework offered here outlines some of the beliefs and predispositions that are likely to influence individual action, and suggests the manner in which these factors are implicated in the decision-making process. Although it is often necessary to concentrate one's research on specific processes, it may be through multivariate, contextual investigation that the antecedents to human action can be most accurately understood.

Theoretical conclusions and implications

All of the general domains of cognition identified in the framework (i.e, attitudes, efficacy beliefs, outcome beliefs, and personal values), were found, in some respect, to guide

behavioural decisions. The factors that were most consistently implicated were efficacy beliefs, outcome expectancies, and personal values. Specifically, both efficacy constructs (self-efficacy and channel efficacy) were found to be strong and direct predictors of behavioural intentions. Experimental results found self-efficacy, in particular, to be a powerful determinant of behavioural choice. These results build on, and add to, the substantial body of evidence that has shown self-efficacy and personal control factors to be strongly implicated in guiding social behaviour.

In general, beliefs regarding behavioural outcomes (i.e., outcome expectancies) were also found to be consistent predictors of behavioural decisions. In addition, the recommended process of systematically exploring the influence of different classes of outcomes that may motivate a behaviour was found to be worthwhile. The three classes of outcomes (economic, social, and environmental) investigated in the current program of research were all found, at some point, to be implicated in guiding behavioural choice. This association was particularly evident for economic outcomes, even though the issue of concern was environmental protection. Although the results of the present research do not provide suitable evidence for determining which outcome domain is the most (or least) powerful predictor, they do confirm the multifaceted nature of outcome expectancies. It is suggested that future research examining social behavioural decisions should attempt to explore the impact of various independent functional motives, rather than assessing only one global outcome expectancy.

In contrast to efficacy beliefs and outcome expectancies, the linkage between attitudinal factors and behavioural intentions was found to be indirect and inconsistent. Although the attitudinal factors (general attitude toward the environment, importance of the environmental issue, and threat perception) enjoyed strong univariate associations with behavioural decisions, their influence was dramatically reduced when they were integrated into a more complex multivariate model. A notable exception in Study 3 was the influence that general attitudes and issue importance had on decisions in the Harvest dilemma scenario. In this case, both constructs were found to account for significant portions of explained

variance. Although attitudinal factors may not always, or even often, directly predict behavioural decisions, their potential role in the decision process should not be dismissed. They may, in fact, function like a heuristic in that they exert more influence on behavioural decisions when beliefs regarding other, more direct, factors are uncertain or not formed. Future multivariate research should continue to explore these relations.

Of all the independent constructs outlined in the framework, the findings regarding personal values are the most intriguing. Significant differences in the responses of the three value groupings were found in Study 2, and in two out of the three situations in Study 3. Non-significant trends consistent with these results were observed in Study 1 and in the third scenario in Study 3. Thus, personal values, in terms of the value placed on three generic motivational domains (i.e., economic, social, universal), were found to guide decisions regarding one specific environmental behaviour, as well as environmental decisions of more personal and societal consequence. Results indicate that personal value systems provide individuals with a motivational foundation in which behavioural decisions are rooted.

Although the value structure employed in the current research was found to be reasonably reliable and relevant, its explanatory utility regarding other issues and behavioural domains remains to be determined. This is particularly true for the social value group. Two concerns regarding this value orientation were observed. First, the scale used to assess this value orientation had an internal consistency that fell below usually acceptable standards. Second, the responses of subjects assigned to this group were, at times, quite enigmatic (e.g., reaction to the economic outcome manipulation in Study 2). Nevertheless, personal values seem to be an integral part of the decision process and should be included in research efforts attempting to explain behaviour, particularly in a social issue context.

It should be pointed out that these conclusions extend only to behavioural decisions and intentions, and not to actual behaviour. None of the studies described in this thesis used actual behaviour as a criterion. Future research should attempt to explore the constructs presented in the framework as they account for differences in actual behaviour.

Implications regarding promoting environmentally protective behaviour

An original objective of this program of research was to explain the apparent discrepancy between strong public support for environmental protection and the moderate amount of action being undertaken in this regard. The research also attempted to address the question, why do some people strongly pursue environmental preservation and protection, and others do not? I believe this research enables me to offer some insight into these issues.

First, pro-environment attitudes are only one factor, and a marginal one at that, in the process that leads people to engage in environmentally protective behaviour. Each individual responds to a myriad of concerns that ultimately motivate her or his actions. These include: how important environmental protection is to the person, whether or not the individual expects that their actions would contribute to creating better environmental conditions, and what other possible outcomes may also result from the behaviour. In fact, people may engage in environmentally protective actions because they can accrue positive economic and/or social outcomes, and not necessarily because they wish to help the environment. The results of this research suggest that an effective method of promoting environmentally protective behaviour would be to inform people about the short-term and long-term economic costs that can result from environmental abuse and destruction. This information could persuade people that pursuing economic interests does not have to conflict with protection of the environment. On the other hand, unacceptable economic or social costs (as defined by each individual) can block an individual from acting in an environmentally protective manner. Furthermore, people must believe they are capable of performing the desired behaviours, and that the actions are feasible (i.e., can reasonably fit into their already over-burdened daily schedule).

In my view, unless the majority of people are convinced that economic needs are best satisfied by environmental protection, environmental protection will only have priority with those people who have a value orientation that places universal concerns and a contributory ethic over other values, in particular the value placed on economic need. Until that time, the

battle over the exploitation of natural resources and the need to regulate behaviour will continue to grow.

References

Ajzen, I. (1985). From intentions to action: A theory of planned behavior. In J. Kuhl & J. Beckman (Eds.), Action-control: From cognition to behavior (pp. 11-39). Heidelberg: Springer.

Ajzen, I., & Fishbein, M. (1973). Attitudinal and normative variables as predictors of specific behaviors. Journal of Personality and Social Psychology, 27, 41-57.

Ajzen, I., & Fishbein, M. (1977). Attitude-behavior relations: A theoretical analysis and review of empirical research. Psychological Bulletin, 84, 888-918.

Ajzen, I., & Fishbein, M. (1980). Understanding attitudes and predicting social behavior. Englewood Cliffs, NJ: Prentice-Hall.

Ajzen, I., & Madden, T. J. (1986). Prediction of goal-directed behavior: The role of intention, perceived control, and prior behavior. Journal of Experimental Social Psychology, 22, 453-474.

Ajzen, I., & Timko, C. (1986). Correspondence between health attitudes and behavior. Basic and Applied Social Psychology, 7, 259-276.

Allport, G., Vernon, P., & Lindzey, G. (1960). Study of values. Test booklet and manual. Boston: Houghton Mifflin Co.

Angus Reid Group, (1992). Canadians and the Environment. Vancouver, B.C.: Angus Reid Group.

Armstrong, T. R. (1972). Why do we still have an ecological crisis? Englewood Cliffs, NJ: Spectrum Books.

Aronson, E. (1991). The Social Animal. New York: W.H. Freeman and Company.

Aronson, E. (1992). The return of the repressed: Dissonance theory makes a comeback. Psychological Inquiry, 3, 303-311.

Aronson, E., & O'Leary, M. (1983). The relative effects of models and prompts on energy conservation. Journal of Environmental Systems, 12, 219-224.

Axelrod, L. J., & Lehman, D. R. (1993). Responding to environmental concerns: What factors guide individual action? Journal of Environmental Psychology, 13, 149-159.

Axelrod, L. J., & Newton, J. W. (1991). Preventing nuclear war: Beliefs and attitudes as predictors of disarmist and deterrentist behavior. Journal of Applied Social Psychology, 21, 29-40.

Balderjahn, I. (1988). Personality variables and environmental attitudes and predictors of ecologically responsible consumption patterns. Journal of Business Research, 17, 51-56.

Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. Psychological Review, 84, 191-215.

Bandura, A. (1982). Self-efficacy mechanism in human agency. American Psychologist, 37, 122-147.

Bandura, A. (1986). Social foundations of thought and action: A social cognitive theory. New York: Prentice-Hall.

Bandura, A., Reese, L., & Adams, N. E. (1982). Microanalysis of action and fear arousal as a function of differential levels of perceived self-efficacy. Journal of Personality and Social Psychology, 43, 5-21.

Becker, M. H. (1974). The health belief model and personal health behavior. Health Education Monographs, 2, 326-473.

Bem, D. J. (1972). Self-perception theory. In L. Berkowitz (Ed.), Advances in Experimental Social Psychology (Vol. 6, pp. 1-62). New York: Academic Press.

Berkowitz, L. (1992). Even more synthesis. Psychological Inquiry, 3, 312-313.

Berkowitz, L., & Devine, P. G. (1989). Research tradition, analysis, and synthesis in social psychological theories: The case of dissonance theory. Personality and Social Psychology Bulletin, 15, 493-507.

Boyd, B., & Wandersman, A. (1991). Predicting undergraduate condom use with the Fishbein and Ajzen and the Triandis attitude-behavior models: Implications for public health interventions. Journal of Applied Social Psychology, 21, 1810-1830.

Cantril, H. & Allport, G. (1933). Recent applications of the study of values. Journal of Abnormal and Social Psychology, 28, 259-273.

Clawson, C. J., & Vinson, D. E. (1978). Human values: An historical and interdisciplinary analysis. In H. K. Hunt (Ed.), Advances in consumer research (Vol. 5, pp. 396-402). Ann Arbor, MI: Association for Consumer Research.

Cohen, J. (1968). Multiple regression as a general data-analytic system. Psychological Bulletin, 70, 426-443.

Cooper, J., & Fazio, R. H. (1984). A new look at dissonance theory. In L. Berkowitz (Ed.), Advances in Experimental Social Psychology (Vol. 17, pp. 229-266). New York: Academic Press.

Davis, F. W., & Yates, B. T. (1982). Self-efficacy expectancies versus outcome expectancies as determinants of performance deficits and depressive affect. Cognitive Therapy and Research, 6, 23-25.

De Young, R. (1986a). Encouraging environmentally appropriate behavior: The role of intrinsic motivation. Journal of Environmental Systems, 15, 281-292.

De Young, R. (1986b). Some psychological aspects of recycling: The structure of conservation satisfactions. Environment and Behavior, 18, 435-449.

Dillehay, R. C. (1973). On the irrelevance of the classical negative evidence concerning the effect of attitudes on behavior. American Psychologist, 28, 887-893.

Duffy, E. (1940). A critical review of investigations employing the Allport-Vernon study of values and other tests of evaluative attitudes. Psychological Bulletin, 37, 597-612.

Dunlap, R. E., Grienecks, J. K., & Rokeach, M. (1983). Human values and pro-environmental behavior. In W.D. Conn (Ed.), Energy and material resources: Attitudes, values, and public policy (pp. 145-168). Boulder, CO: Westview Press.

Eagly, A. H. (1992). Uneven progress: Social psychology and the study of attitudes. Journal of Personality and Social Psychology, 63, 693-710.

Fazio, R. H. (1989). On the power and functionality of attitudes: The role of attitude accessibility. In A. R. Pratkanis, S. J. Breckler, & A. G. Greenwald (Eds.), Attitude structure and function (pp. 153-179). Hillsdale, NJ: Erlbaum.

Fazio, R. H., Chen, J., McDonel, E. C., & Sherman, S. J. (1982). Attitude accessibility, attitude-behavior consistency, and the strength of object-evaluation association. Journal of Experimental Social Psychology, 18, 339-357.

Fazio, R. H., & Williams, C. J. (1986). Attitude accessibility as a moderator of the attitude-perception and attitude-behavior relations: An investigation of the 1984 presidential election. Journal of Personality and Social Psychology, 51, 505-514.

Fazio, R. H., & Zanna, M. P. (1978). Attitudinal qualities relating to strength of the attitude-behavior relationship. Journal of Experimental Social Psychology, 14, 398-408.

Fazio, R. H., & Zanna, M. P. (1981). Direct experience and attitude-behavior consistency. In L. Berkowitz (Ed.), Advances in Experimental Social Psychology, (Vol. 14, pp. 164-181). New York: Academic Press.

Festinger, L. (1957). A theory of cognitive dissonance. Stanford: Stanford University Press.

Festinger, L., & Carlsmith, J. (1959). Cognitive consequences of forced compliance. Journal of Abnormal and Social Psychology, 58, 203-210.

Fishbein, M., & Ajzen, I. (1975). Belief, attitude, intention and behavior: An introduction to theory and research. Reading, MA: Addison Wesley.

Forsyth, D. R. (1985). Individual differences in information integration during moral judgment. Journal of Personality and Social Psychology, 49, 264-272.

Gallup, G. Jr., & Newport, F. (1990). Americans strongly in tune with the purpose of Earth Day 1990. Gallup Poll, 54, 1-5.

Granberg, D. (1985). An anomaly in political perception. Public Opinion Quarterly, 49, 504-516.

Hardin, G. J. (1968). The tragedy of the commons. Science, 162, 1243-1248.

Henion, K. E. (1972). The effect of ecologically-relevant information on detergent sales. Journal of Marketing Research, 9, 10-14.

Hines, J. M., Hungerford, H. R., & Tomera, A. N. (1987). Analysis and synthesis of research on responsible environmental behavior: A meta-analysis. Journal of Environmental Education, 18, 1-8.

Homer, P. M., & Kahle, L. R. (1988). A structural equation test of the value-attitude-behavior hierarchy. Journal of Personality and Social Psychology, 54, 638-646.

Huebner, R. B., & Lipsey, M. W. (1981). The relationship of three measures of locus of control to environmental activism. Basic and Applied Social Psychology, 2, 45-58.

Jacobs, H. E., & Bailey, J. S. (1982). Evaluating participation in a residential recycling program. Journal of Environmental Systems, 12, 141-152.

Judd, C. M., & Johnson, J. T. (1981). Attitudes, polarization, and diagnosticity: Exploring the effects of affect. Journal of Personality and Social Psychology, 41, 25-36.

Kahle, L. R. (Ed.). (1983). Social values and social change: Adaptation to life in America. New York: Praeger.

Kallgren, C. A., & Wood, W. (1986). Access to attitude-relevant information in memory as a determinant of attitude-behavior consistency. Journal of Experimental Social Psychology, 22, 328-338.

Kantola, S. J., Syme, G. J., & Campbell, N. A. (1982). The role of individual differences and external variables in a test of the sufficiency of Fishbein's model to explain behavioral intentions to conserve water. Journal of Applied Social Psychology, 12, 70-83.

Kantola, S. J., Syme, G. J., & Nesdale, A. R. (1983). The effects of appraised severity and efficacy in promoting water conservation: An informational analysis. Journal of Applied Social Psychology, 13, 164-182.

Katz, D. (1960). The functional approach to the study of attitudes. Public Opinion Quarterly, 24, 163-204.

Katz, D. & Stotland, E. (1959). A preliminary statement to a theory of attitude structure and change. In S. Koch (Ed.), Psychology: A study of a science (Vol. 3, pp. 423-475). New York: McGraw-Hill.

Kirtines, W. M. (1986). Moral behavior as rule governed behavior: Person and situation effects on moral decision making. Journal of Personality and Social Psychology, 50, 784-791.

Kluckhohn, C. (1951). Values and value orientations in the theory of action. In T. Parsons & E. A. Shils (Eds.), Toward a general theory of action. Cambridge, MA: Harvard University Press.

Kohlberg, L. (1958). The development of modes of moral thinking and choice in the years ten to sixteen. Unpublished doctoral dissertation, University of Chicago, Chicago.

Krosnick, J. A. (1989). Attitude importance and attitude accessibility. Personality and Social Psychology Bulletin, 15, 297-308.

Krosnick, J. A. (1990). Government policy and citizen passion: A study of issue publics in contemporary America. Political Behavior, 12, 59-92.

Krosnick, J. A., Boninger, D. S., Chuang, Y. C., Berent, M. K., & Carnot, C. G. (1993). Attitude strength: One construct or many related constructs? Journal of Personality and Social Psychology, 65, 1132-1151.

LaPiere, R. T. (1934). Attitudes versus actions. Social Forces, 13, 230-237.

Luyben, P. D., & Bailey, J. S. (1979). Newspaper recycling: The effects of rewards and proximity of containers. Environment and Behavior, 11, 539-557.

Maddux, J. E., Norton, L. W., & Stoltenberg, C. D. (1986). Self-efficacy expectancy, outcome expectancy, and outcome value: Relative effects on behavioral intentions. Journal of Personality and Social Psychology, 51, 783-789.

Maddux, J. E., & Rogers, R. W. (1983). Protection motivation and self-efficacy: A revised theory of fear appeals and attitude change. Journal of Experimental Social Psychology, 19, 469-479.

Margolin, J. B., & Misch, M. R. (1978). Incentives and disincentives for ridesharing: A behavioral study. Washington, D.C.: U.S. Government Printing Office.

Maslow, A. H. (1970). Motivation and Personality. New York: Harper & Row.

Maslow, A. H. (1971). The Farther Reaches of Human Nature. New York: Viking Press.

Merchant, C. (1992). Radical ecology: The search for a livable world. New York: Routledge, Chapman, & Hall, Inc.

Milbrath, L. (1986). Environmental beliefs and values. In M. Herman (Ed.), Political Psychology (pp. 97-138). San Francisco: Jossey-Bass.

Needleman, L. D., & Geller, E. S. (1992). Comparing interventions to motivate work-site collection of home-generated recyclables. American Journal of Community Psychology, 20, 775-785.

Neuman, K. (1986). Personal values and commitment to energy conservation. Environment and Behavior, 18, 53-74.

Omoto, A. M., & Snyder, M. (1990). Basic research in action: Volunteerism and society's response to AIDS. Personality and Social Psychology Bulletin, 16, 152-165.

Oskamp, S., Harrington, M. J., Edwards, T. C., Sherwood, D. L., Okuda, S. M., & Swanson, D. C. (1991). Factors influencing household recycling behavior. Environment and Behavior, 23, 494-519.

Paterson, R. J., & Neufeld, R. W. J. (1987). Clear danger: Situational determinants of the appraisal of threat. Psychological Bulletin, 101, 404-416.

Plous, S. (1993). The psychology of judgment and decision-making. New York: McGraw-Hill.

Pratkanis, A. R., & Greenwald, A. G. (1989). A sociocognitive model of attitude structure and function. In L. Berkowitz (Ed.), Advances in Experimental Social Psychology (Vol. 22, pp. 245-285). New York: Academic Press.

Raden, D. (1985). Strength-related attitude dimensions. Social Psychology Quarterly, 48, 312-330.

Regan, D. T., & Fazio, R. F. (1977). On the consistency between attitudes and behavior: Look to the method of attitude formation. Journal of Experimental Social Psychology, 13, 28-45.

Rokeach, M. (1967). Value Survey. Sunnyvale, CA: Halgren Tests.

Rokeach, M. (1973). The nature of human values. New York: The Free Press.

Rokeach, M. (1980). Some unresolved issues in theories of beliefs, attitudes, and values. In M. M. Page (Ed.), 1979 Nebraska Symposium on Motivation. Lincoln: University of Nebraska Press.

Rogers, R. W. (1975). A protection motivation theory of fear appeals and attitude change. The Journal of Psychology, 91, 93-114.

Ross, L., & Nisbett, R. E. (1991). The person and the situation: Perspectives of social psychology. New York: McGraw-Hill, Inc.

Scher, S. J., & Cooper, J. (1989). Motivational basis of dissonance: The singular role of behavioral consequences. Journal of Personality and Social Psychology, 56, 899-906.

Schwartz, S. H. (1977). Normative influences on altruism. In L. Berkowitz (Ed.), Advances in Experimental Social Psychology (Vol. 10, pp. 221-279). New York: Academic Press.

Schwartz, S. H. (1992). Universals in the content and structure of values: Theoretical advances and empirical tests in 20 countries. In M. P. Zanna (Ed.), Advances in Experimental Social Psychology (Vol. 25, pp. 1-65). San Diego: Academic Press.

Schwartz, S. H., & Bilsky, W. (1987). Toward a universal psychological structure of human values. Journal of Personality and Social Psychology, 53, 55-562.

Schwartz, S. H., & Bilsky, W. (1990). Toward a theory of the universal content and structure of values: Extensions and cross-cultural replications. Journal of Personality and Social Psychology, 58, 878-891.

Schwartz, S. H., & Tessler, R. C. (1972). A test of a model of reducing measured attitude-behavior discrepancies. Journal of Social and Personality Psychology, 24, 225-236.

Shavitt, S. (1989). Operationalizing functional theories of attitude. In A. R. Pratkanis, S. J. Breckler, & A. G. Greenwald (Eds.), Attitude structure and function (pp. 311-337). Hillsdale, NJ: Erlbaum.

Sherif, C. W. (1980). Social values, attitudes, and involvement of the self. 1979 Nebraska Symposium on Motivation (pp. 1-64). Lincoln: University of Nebraska Press.

Sherman, S. J. (1987). Cognitive processes in the formation, change, and expression of attitudes. In M. P. Zanna, J. M. Olson, & C. P. Herman (Eds.), Social Influence: The Ontario symposium, Vol. 5 (pp. 75-106). Hillsdale, NJ: Erlbaum.

Simon, H. A. (1957). Models of man: Social and rational. New York: Wiley.

Sivacek, J., & Crano, W. D. (1982). Vested interest as a moderator of attitude-behavior consistency. Journal of Personality and Social Psychology, 43, 210-221.

Smith, M. B., Bruner, J. S., & White, R. W. (1956). Opinions and personality. New York: Wiley.

Snyder, M. (1982). When believing means doing: Creating links between attitudes and behavior. In M. P. Zanna, E. T. Higgins, & C. P. Herman (Eds.), Consistency in social behavior (pp. 105-130). Hillsdale, NJ: Erlbaum.

Snyder, M., & Debono, K. G. (1987). A functional approach to attitudes and persuasion. In M. P. Zanna, J. M. Olson, & C. P. Herman (Eds.), Social Influence: The Ontario Symposium (Vol. 5, pp. 107-125). Hillsdale, NJ: Erlbaum.

Snyder, M., & Debono, K. G. (1989). Understanding the functions of attitudes: Lessons from personality and social behavior. In A. R. Pratkanis, S. J. Breckler, & A. G. Greenwald (Eds.), Attitude structure and function (pp. 339-359). Hillsdale, NJ: Erlbaum.

Snyder, M., & Omoto, A. M. (1992). Who helps and why? The psychology of AIDS volunterism. In S. Oskamp & S. Spacapan (Eds.), Helping and being helped in the real world: Naturalistic studies. Newbury Park, CA: Sage.

Steele, C. (1988). The psychology of self-affirmations: Sustaining the integrity of the self. In L. Berkowitz (Ed.), Advances in Experimental Social Psychology (Vol. 21, pp. 261-302). San Diego: Academic Press.

Steele, C., & Liu, T. (1983). Dissonance processes as self-affirmation. Journal of Personality and Social Psychology, 45, 5-19.

Steele, C., & Spencer, S. J. (1992). The primacy of self-integrity. Psychological Inquiry, 3, 345-346.

Stern, P. C., Dietz, T., & Kalof, L. (1993). Value orientations, gender, and environmental concern. Environment and Behavior, 25, 322-348.

Thompson, S. C., & Stoutemyer, K. (1991). Water use as a commons dilemma: The effects of education that focuses on long-term consequences and individual action. Environment and Behavior, 23, 314-333.

Triandis, H. C. (1980). Values, attitudes, and interpersonal behavior. In M. M. Page (Ed.), 1979 Nebraska Symposium on Motivation (pp. 195-259). Lincoln: University of Nebraska Press.

Tversky, A. & Kahneman, D. (1981). The framing of decisions and the psychology of choice. Science, 21, 452-458.

Vining, J., & Ebreo, A. (1988). A survey of residents' responses to a citywide curbside recycling program before and after expansion. Report to the City of Champaign, Ill.

Vining, J., & Ebrea, A. (1990). What makes a recycler?: A comparison of recyclers and nonrecyclers. Environment and Behavior, 22, 55-73.

Walster, E., Berscheid, E., & Walster, G. W. (1973). New directions in equity research. Journal of Personality and Social Psychology, 25, 151-176.

Weigel, R. H., & Newman, L. S. (1976). Increasing attitude-behavior correspondence by broadening the scope of the behavioral measure. Journal of Personality and Social Psychology, 33, 793-802.

Wicker, A. W. (1969). Attitudes versus action: The relationship of verbal and overt behavioral responses to attitude objects. Journal of Social Issues, 25, 41-48.

Wicker, A. W. (1971). An examination of the "other variables" explanation of attitude-behavior inconsistency. Journal of Personality and Social Psychology, 19, 18-30.

Wolf, S., Gregory, W. L., & Stephan, W. G. (1986). Protection motivation theory: Predictions of intentions to engage in anti-nuclear war behaviors. Journal of Applied Social Psychology, 16, 310-321.

Zanna, M. P., Olson, J. M., & Fazio, R. H. (1981). Self-perception and attitude behavior consistency. Personality and Social Psychology Bulletin, 7, 252-256.

Table 1

Univariate and partial correlation coefficients for the predictor variables regarding intentions to perform the criterion behaviour in Study 1

Predictor	Univariate r	(R = .74) Partial r
Environmental outcome expectancy	.57*	.36*
Economic outcome expectancy	.49*	.18!
Social outcome expectancy	.37*	.05
Self-efficacy	.29*	.18!
Channel efficacy	.49*	.33*
Environmental outcome value	.44*	.09
Economic outcome value	.15	.12
Social outcome value	.05	-.01
General attitude	.19*	.07
Issue importance	.27*	.15
Threat perception	.04	-.23*

* $p < .05$; ! $p < .10$

Note: Partial correlation coefficients derived from simultaneous entry regression procedure.

Table 2

Mean importance ratings of the three behavioural outcomes for the different value orientations

	Value orientation		
Outcome value	Economic	Social	Universal
Economic	7.77_a	6.77_b	6.73_b
Social	6.73_a	6.49_a	5.20_b
Environmental	7.06_a	7.15_a	7.82_b

Note. Significant differences within rows are indicated by different subscripts, $p < .05$.

Table 3

Mean behavioural intention ratings for interaction between value orientation and economic outcome condition in Study 2

Economic outcome Condition	Value orientation		
	Economic	Social	Universal
Low	4.13_a	5.73	6.20
High	5.25_b	5.00	6.00

Note. Significant differences within columns are indicated by different subscripts, $p < .05$.

Table 4

Univariate and partial correlation coefficients for the predictor variables regarding intentions to perform the criterion behaviour in Study 2

Predictor	Univariate r	(R = .74) Partial r
Environmental outcome expectancy	.51*	.25*
Economic outcome expectancy	.48*	.02
Social outcome expectancy	.58*	.40*
Self-efficacy	.45*	.27*
Channel efficacy	.50*	.29*
Environmental outcome value	.44*	.16
Economic outcome value	.07	-.03
Social outcome value	-.04	-.06
General attitude	.11	-.01
Issue importance	.20*	-.00
Threat perception	.21*	.04

* $p < .05$

Note: Partial correlation coefficients derived from simultaneous entry regression procedure.

Table 5

Value differences in the percentage of subjects selecting the environmentally protective course of action in 3 ecological dilemmas

	Value orientation		
Dilemma	Economic	Social	Universal
Commons	$71\%_a$	$89\%_b$	$86\%_b$
Harvest	$50\%_a$	$55\%_a$	$85\%_b$
Waste	$85\%_a$	$94\%_a$	$94\%_a$

Note. Significant differences within a row are indicated by different subscripts, $p < .05$.

Table 6

Comparisons of the influence of context on behavioral decisions for each value orientation

Dilemma	Economic/ Environment Conflict	Value Orientation: Economic	Social	Universal
Commons	High	62.5%	87.5%	83.3%
	Low	79.2%	90.9%	88.0%
Harvest	High	$29.2\%_a$	56.5%	87.0%
	Low	$70.8\%_b$	54.2%	84.0%
Waste	High	$75.0\%_a$*	92.0%	87.5%
	Low	$96.0\%_b$*	95.5%	100%

Note. Tabled values are percentage of subjects supporting the environmentally-protective course of action. Significant differences within a column are indicated by different subscripts, $p < .01$, * $p < .10$.

Table 7

Mean importance ratings of select reasons found to be implicated in guiding subjects' decisions in the Commons dilemma

Reason	Value Orientation		
	Economic	Social	Universal
Short-term financial needs	3.42_a	2.93_b	2.71_b
Relationship with other ranchers	3.85_a	4.50_b	3.80_a
What one's family thinks	2.98_a	3.48_b	3.00_a
Rights of other ranchers violated	3.70_a	4.33_b	4.35_b
Hurt other ranchers financially	3.63_a	4.25_b	4.04_b
Adhere to one's principles	3.90_a	4.33_b	4.63_c
Purchasing cattle violates moral code	3.62_a	4.46_b	4.55_b
Is agreement legally binding	2.88_a	2.64_a	2.08_b
Expectations regarding other ranchers	3.60_a	3.50_a	3.06_b
Right to make a better life	3.85_a	3.55_a	3.41_a
Right to pursue economic interests	3.13_a	2.70_a	2.92_a
One's long-term goals	4.32_a	3.89_a	3.84_a

Note. Significant differences within rows are indicated by different subscripts, $p < .05$.

Table 8

Mean importance ratings of select reasons found to be implicated in guiding subjects' decisions in the Harvest dilemma

Reason	Value Orientation		
	Economic	Social	Universal
How affect personal financial situation	4.15_a	3.74_b	3.23_c
One's relationship with townspeople	2.81_a	3.21_b	2.76_a
The costs to the environment	3.88_a	4.30_b	4.64_c
Whether any laws would be violated	3.27_a	2.83_a	2.98_a
Effect on friends and neighbors	3.10_a	3.38_a	3.23_a
Long-term needs of society	3.90_a	4.02_a	3.91_a
Effect on animal species	3.67_a	4.02_a	4.30_a
What other townspeople want	2.75_a	3.00_a	2.47_a
A person's right to have a job	3.44_a	3.52_a	2.83_a
Economic responsibility of town	3.35_a	3.24_a	2.64_a
Short-term economic interests of town	3.21_a	3.17_a	2.60_a
Availability of alternative industries	3.85_a	3.87_a	3.76_a

Note. Significant differences within rows are indicated by different subscripts, $p < .05$.

Table 9

Mean importance ratings of select reasons found to be implicated in guiding subjects' decisions in the Waste dilemma

Reason	Value Orientation		
	Economic	Social	Universal
Cost to community residents	3.67_a	3.70_a	3.19_b
Adhering to core principles	3.46_a	3.91_b	4.15_b
How proposal would affect environment	4.13_a	4.48_b	4.67_b
What the majority want to do	2.71_a	2.61_a	2.08_b
What the government recommends	2.50_a	2.33_a	2.14_a
What family and friends support	2.73_a	2.80_a	2.41_a
Ability to pay new fees	3.58_a	3.43_a	3.12_a
Long-term needs of city	4.21_a	4.50_a	4.24_a
Right of government to regulate	2.92_a	2.91_a	2.96_a
Convenience of recycling option	3.35_a	3.50_a	2.52_b
Space limitations in one's home	2.98_a	2.66_{ab}	2.36_b
Aesthetics of the neighborhood	3.26_a	3.47_a	2.94_a

Note. Significant differences within rows are indicated by different subscripts, $p < .05$.

Table 10

Percentage of subjects ranking different categories of motives as "most important" in influencing their decisions

		Value Orientation		
Dilemma	Motive	Economic	Social	Universal
Commons	Economic	58.3%$_a$	12.8%$_b$	10.2%$_b$
	Social	8.3%$_b$	29.8%$_a$	12.2%$_b$
	Environmental	20.8%$_a$	44.7%$_b$	67.0%$_c$
Harvest	Economic	39.6%$_a$	14.9%$_b$	6.1%$_b$
	Social	2.1%$_b$	17.0%$_a$	10.0%$_{ab}$
	Environmental	33.0%$_a$	44.7%$_{ab}$	63.3%$_b$
Waste	Economic	20.8%$_a$	10.6%$_{ab}$	4.1%$_b$
	Social	27.0%$_a$	25.5%$_a$	12.2%$_a$
	Environmental	37.5%$_a$	57.5%$_b$	81.6%$_c$

Note. Significant differences within rows are indicated by different subscripts, $p < .05$.

Table 11

Univariate and partial correlation coefficients for independent factors as predictors of decisions in the Harvest dilemma

Predictor Variables	Univariate Correlation	Partial Correlation (R = .57)	Variance Explained
General attitude	.41	.24	4.0%*
Issue Importance	.39	.24	4.0%*
Manipulation effect	.09	.30	6.8%*
Value difference #1 (universal vs. others)	.33	.26	4.7%*
Value difference #2 (social vs. others)	-.13	.22	3.4%*
Value difference #1 by manipulation	-.14	-.26	4.8%*
Value difference #2 by manipulation	.28	-.22	3.5%*

* $p < .02$

Table 12

Level of conflict experienced in the different outcome conditions for each dilemma

	Level of economic-environmental conflict	
Dilemma	Low	High
Commons	3.97_a	4.85_b
Harvest	4.70_a	4.76_a
Waste	2.70_a	3.51_b

Note. Significant differences within rows are indicated by different subscripts, $p < .05$.

Table 13

Level of conflict experienced when subjects made value consistent decisions versus value inconsistent decisions

Dilemma	Decision	Value Orientation		
		Economic	Social	Universal
Harvest	Harvest	$3.71(24)_a$	5.33(21)	5.00(7)
	Preserve	$4.54(24)_b$	4.81(26)	5.02(41)
Waste	Landfill	2.50(6)	4.67(3)	$4.67(3)_a$
	Recycle	3.51(41)	3.12(43)	$2.61(46)_b$

Note. Significant differences within columns are indicated by different subscripts, $p < .10$. Figures in parentheses represent number of subjects selecting that option.

Figure 1

Sociocognitive framework of guided behaviour

Statement about General Motivation	Specific Constructs	Definition of constructs	Theoretical Relation to Behavioural Decision
I believe	General Attitude	Global evaluation of issue/object	Indirect and inconsistent, but theoretically-relevant
	Attitude Strength	Accessibility, importance, or personal relevance of attitude	Direct in terms of mediating attitude-behaviour relation
	Other relevant attitudes	Evaluative beliefs about related issues or objects (e.g., threat posed by attitude object)	Possibly direct depending on type of behaviour
I can	Self-efficacy	Capability of performing specified behaviour	Direct and causal
	Channel efficacy	Perception of accessibility to specified behaviour	Direct and causal
I desire/expect	Outcome expectancy	Expectations that certain outcomes will be derived from actions. (Beliefs regarding specific outcome domains should be systematically analyzed)	Direct and causal
	Outcome value	Value of expected outcomes	Associated, but relation currently unclear
I value	Individual value orientations	Value individual places on core, generic terminal goals (i.e., economic, social, universal)	Indirect through attitudes, outcome beliefs; possibly direct as well

Figure 2
Description of Prominent Value Structures

Allport, Vernon, Lindzey (1992) Study of Values (1960) Values	Maslow's Hierarchy of Needs (1970,71)	Rokeach Value Survey (1968)	Kahle (1983) List of Values	Schwartz's Universal Structure of Human
		Description of Value Structure		
Describes the six basic interests or personality motives	Describes a need hierarchy that motivates human behaviour	Identifies "all" the terminal values important in human life	Specifies the values most relevant to daily life	Describes universal list of human values or motivational types
		Content Domains in Value Theories		
Theoretical (search for truth)	Physiological Needs	A Comfortable Life	Self-fulfilment	Self-direction
Economic (values things tangible)	Safety Needs	An Exciting Life	Excitement	Stimulation
Aesthetic (values beauty)	Belonging & Love Needs	A Sense of Contribution	A Sense of Accomplishment	Hedonism
Social (altruistic love)	Self-esteem Needs	A World at Peace	Self-respect	Achievement
Political (power & influence)	Self-actualization	A World of Beauty	A Sense of Belonging	Power
Religious (spirituality & unity)		Equality	Being Well-respected	Security
		Family Security	Security	Conformity
		Freedom	Fun & Enjoyment	Tradition
		Happiness	Warm Relationships	Benevolence
		Inner Harmony		Universalism
		Mature Love		
		National Security		
		Pleasure		
		Salvation		
		Self-respect		
		Social Recognition		
		True Friendship		
		Wisdom		
		Assessment Techniques		
Personal value type measured by relative preference rankings of alternatives representing each interest over 45 items	No measurement scale	Value hierarchies established by rank ordering all 18 values from most to least important	Value hierarchies identified by independent ratings of each value	Factor structure derived from ratings of 56 individual values

Figure 3

Proposed Value Taxonomy

Description of Value Structure

Specifies three core value domains which have clear motivational attributes

Content Domains in Value Theories

1. Economic/Self-enhancing
   - values things tangible
   - values economic security

2. Social
   - benevolence to community
   - a sense of belonging

3. Universal
   - a sense of contribution
   - self-respect

Assessment Technique

Individual orientations assessed by preference rankings of three alternatives representing each of the three motivational domains.

Appendix 1

Pre-test questions used to assess attitudinal constructs.

General Attitude items

Note: All items were responded to on a six-point scale ranging from "strongly disagree" to "strongly agree."

(1) "It is more important for human life to progress than it is to protect animal or plant life."

(2) "The resources of the earth exist for the use of humankind."

(3) "Environmental protection must not stand in the way of providing economic opportunity for everyone."

(4) "The earth will always be able to provide the resources necessary for the human race to survive."

(5) "The behaviour of humans needs to become more sensitive to the environment if the human race is to survive."

(6) "The extinction of animal and plant species is acceptable as long as alternative resources exist."

Issue Importance Items

(1) "How important is environmental protection to you?" Rated on six-point scale ranging from "not very important" to "very important."

(2) "Please rank the following issues from '1' (the most important to you) to '10' (the least important to you)." The issues were: AIDS, Civil Rights, Crime, Drugs, Economics (Jobs), the Environment, the Homeless, Hunger, Nuclear Weapons, and Poverty.

Threat Perception Items

(1) "How likely is it that major environmental destruction will happen?" Rated on six-point scale ranging from "very unlikely" to "very likely."

(2) "How severe will the consequences of major environmental destruction be to nature and life?" Rated on six-point scale ranging from "not very severe" to "very severe."

(3) "How soon, if at all, will major environmental destruction occur?" Rated on six-point scale ranging from "never" to "very soon."

Appendix 2

Revised items used to assess value orientations in pre-test for Studies 2 and 3.

Instructions

A number of questions regarding your views of yourself are given below, each with three possible responses. Please indicate how you feel about each alternative by assigning a score next to each response (0, 1, 2, 3, or 4) so that the total amount across all three responses equals 4. **You should give higher numbers to the answers that you feel better represent your thoughts**.

For example, you could assign answers in the following ways:

Example 1	Example 2	Example 3	Example 4
a = 3	a = 2	a = 1	a = 0
b = 1	b = 1	b = 0	b = 4
c = 0	c = 1	c = 3	c = 0

Example (1) represents the situation where you most strongly support answer (a), slightly support answer (b), and do not at all support answer (c). The responses in example (2) would indicate that you support each alternative to some extent, but that answer (a) is more consistent with your views than either (b) or (c).

Please assign values as you see fit keeping in mind that you must distribute exactly 4 points across the three responses.

1. Which of the following do you think defines success in life?

   (a) contributing something back to society
   (b) having close and satisfying relationships with others
   (c) achieving a high level of prosperity

   a = ____ b = ____ c = ____

2. If you should see the following headlines in your newspaper, which would you read more attentively?

   (a) GREAT IMPROVEMENT IN MARKET CONDITIONS
   (b) HUNGER STRIKE CALLS INTO QUESTION GOVERNMENT POLICY
   (c) GOOD RELATIONSHIPS: THE KEY TO HAPPINESS

   a = ____ b = ____ c = ____

3. When you think about being rewarded for your actions, which do you more highly value?

   (a) financial rewards
   (b) maintaining respect from family and friends
   (c) a sense of self-respect

   a = ____ b = ____ c = ____

4. Which of the following goals do you pursue more strongly:

   (a) achieving a sense of belonging and acceptance from others
   (b) attaining a comfortable and financially secure life
   (c) maintaining a sense of self-respect derived from acting in accord with deeply held values

   a = ____ b = ____ c = ____

5. When deciding how to act with regard to global issues, you would definitely:

   (a) keep in mind the social responsibility of your actions
   (b) attempt to protect your economic well-being
   (c) look to the behavior of others as a guide to the appropriateness of your actions

   a = ____ b = ____ c = ____

6. When unsure about how to act in an unfamiliar situation, you would consider:

   (a) how your actions would affect your financial situation
   (b) how others may perceive what you do as either good or bad
   (c) how consistent your actions would be with what you value

   a = ____ b = ____ c = ____

7. If you were given an award honouring a contribution you made to society, you would be most satisfied by:

   (a) sharing your honour with close friends and family
   (b) receiving the large cash award
   (c) knowing you've worked to benefit your society

   a = ____ b = ____ c = ____

8. When considering a position in your chosen career, you would be most interested in:

   (a) working in a friendly, accepting environment
   (b) working for a socially-responsible organization
   (c) earning a good salary

   a = ____ b = ____ c = ____