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THE INFLUENCE OF ATTITUDES AND SOCIAL EXPERIENCES ON ENVIRONMENTAL CHOICES

by

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The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies for acceptance, a thesis entitled "The Influence of Attitudes and Social Experiences on Environmental Choices" submitted by Glenda Wall in partial fulfillment of the requirements for the degree of Master of Arts.

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ABSTRACT

Using data from a 1990 random sample of Edmonton residents, and applying LISREL techniques, this study examines the perceptual, situational, and structural influences on environmental lifestyle choices using structural equation models that feature environmental attitudes as a mediating variable. An exploration of the factors which influence environmental attitude-behaviour consistency supplements this analysis. Results indicate that, in this sample, general environmental concern did have a weak positive effect on environmental choices, but that the personal costs and risks associated with environmental problems and behaviours had stronger effects. In addition, exploratory findings show that the consistency between environmental concern and behaviour is increased when social arrangements favour ease of action. The findings support the suggestion that attempts to encourage increased environmental behaviour by promoting awareness will meet with limited success unless an environmental issue is linked to immediate personal concerns or societal mechanisms are in place to reduce the costs of compliance.

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TABLE OF CONTENTS

Page

LIST OF TABLES

LIST OF FIGURES

CHAPTER 1
INTRODUCTION

In a widely cited article in 1972 Anthony Downs predicted that mass environmental concern among the American public would go through the same "issue-attention cycle" as many other popular public issues, with concern gradually declining as Americans realized the costs and sacrifices involved in solving the problem. Following the same logic as Downs', the late 70's also saw theorists speculating that environmental concern would remain largely elitist and would not be taken up by the less affluent members of society who had the most to lose from such reform (Morrison, 1986: 188-89; Buttel & Flinn, 1974). For the most part these predictions proved untrue. Levels of environmental concern stabilized in the mid 1970's and began to rise dramatically in the 1980's such that by the spring of 1990 they had reached unsurpassed levels (Dunlap & Scarce, 1991: 652). There is also ample evidence to suggest that environmental problems are a concern for members of all socioeconomic groups.

The magnitude and persistence of environmental concern sustained two decades of social scientific research aimed at understanding the social bases of environmental attitudes. More recently many research and theoretical efforts have shifted toward explanations of the consensual nature of public environmental concern in North America and Western Europe. As in other areas of attitude studies, however, the weak connection between attitudes and behaviour calls into question the significance of research and theory efforts aimed at understanding attitudes. Researchers have demonstrated a clear gap between levels of concern and public involvement in pro-environmental behaviours. This suggests that a more important research question lies in examining the strength of the public commitment to environmental quality as measured by the actual behaviour people are willing to engage in to solve environmental problems, and in developing an understanding of the barriers to such action. A comprehensive study based on this research problem would encompass the effects of both attitudes and social structure on behaviour.

As several researchers have advised, changes in environmental conditions will

depend, to a large degree, on how effectively public opinion can be mobilized and converted into concrete action (Dunlap, 1991: 36; Roper Organization, 1990: 29, 80-81). Statements such as these reflect an assumption that social conditions can influence the consistency between attitudes and behaviour, and have led researchers to suggest that the factors related to environmental attitude-behaviour consistency be more closely explored as well (Uusitalo, 1990: 212-13). Although an examination of the reasons behind the continued popularity of environmental concern, combined with an investigation of the factors associated with both environmental attitudes and behaviour, can shed some light on the environmental attitude-behaviour relationship, a more direct way to explore this relationship is to create a measure of consistency and examine the factors associated with it.

Using data from a 1990 random sample survey of residents of Edmonton, this study will undertake an examination of the factors associated with general environmental attitudes and specified environmental behaviours as well as a direct exploration of the influences on environmental attitude-behaviour consistency. The specific behaviours to be tested include consumer willingness to pay more for an environmentally safe product, consumer attempts to purchase organically grown foods and recycling behaviour, while attitudes, as used in this study, reflect general environmental concern.

The variables hypothesized to predict attitudes, behaviour and the attitude-behaviour relationship reflect past research findings and theoretical insights in the areas of social inequality, social psychology and theories of rational choice. These variables include age, education, income, occupational status, gender, political beliefs, media exposure, family composition, access to environmental programs, perceptions of mobility, personal efficacy and perceptions of personal risk.

Using these variables, the direct and indirect predictors of each individual environmental behaviour will be compared using structural equation models that will include attitudes as a mediating variable. While hypotheses regarding the determinants

of environmental concern[1] will be tested within each model, the main focus will remain on extending an understanding of the motives and barriers associated with individual environmental behaviours. The variables used in the structural equation models for each behaviour will then be employed in exploratory tests of the factors associated with measures of environmental attitude-behaviour consistency. Finally, the attempt will be made to validate hypotheses which are supported in this analysis, where possible, using data from the 1991 Edmonton area survey.[2]

Several assumptions underlie this analysis. In the examination of environmental behaviour, the assumptions that attitudes influence behaviour,[3] and that factors other than attitudes also influence behaviour, are implicit. Thus, it is acknowledged that environmental behaviour can occur even in the absence of concern, and that in addition to the effects of attitude, factors that influence behaviour directly, apart from the attitude-behaviour relationship, need to be studied. Because it is assumed that attitudes do influence behaviour, however, and given that environmental attitude-behaviour consistency is generally accepted to be low, the factors that influence attitude-behaviour consistency will also be studied. This involves accepting the supposition that the consistency between attitudes and behaviour can be enhanced or inhibited by structural conditions. Finally, implicit in the models proposed is the rational choice assumption that within a given set of structural and informational constraints people make choices based

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[1]The terms environmental concern and environmental attitudes will be used synonymously throughout this study.

[2]Comparable data for use in re-testing, in the 1991 survey, is available for the recycling model only.

[3]Social psychology research in the areas of cognitive consistency and dissonance suggests that behaviour can also influence attitudes (Bem (1972) in Heberlein & Black, 1981; Liska, 1984; Liska et al., 1984). Although the reciprocal nature of attitudes and behaviour is acknowledged, the statistical ability to analyze such a relationship within the models specified is lacking in this case. As such, only the unidirectional influence of attitudes on behaviour will be formally modeled.

on what they believe will bring the best results.

Taking into consideration the above assumptions and the review of literature, the models to be tested in this study reflect the following expectations:

1. Both environmental attitudes and behaviour will be influenced directly by a variety of socioeconomic, demographic, contextual and attitudinal variables as outlined above.
2. The effect of socioeconomic, demographic and contextual variables on behaviour will also occur indirectly as mediated by attitudes.
3. That among the variables expected to predict attitudes and/or behaviour will be found some that also influence the consistency between environmental attitudes and behaviour.

There are several limitations associated with this research project. Most of these are related to the measurement compromises made necessary by the use of secondary data. For example, variables in the survey which measure specific environmental concern do not match questions regarding specific environmental behaviours. It was therefore necessary, in this study, to measure environmental attitudes using an indicator that reflects general environmental concern. The analysis of both the strength and the nature of the relationship between attitudes and behaviour will be diluted by the degree to which a lack of correspondence between attitudes and behaviour exists.[4] Another limitation involves the fact that the environmental behaviour examined in this study only encompasses specific consumer actions or intentions and recycling behaviour. The ability to generalize beyond these behaviours is limited given suggestions in the research that distinct environmental behaviours may be unrelated. Finally, the rarity of published Canadian research in this area necessitated a heavy reliance on American research findings in the development of the literature review and the subsequent hypotheses.

The significance of this study will be enhanced by its contribution to Canadian research in this area. Within the limits outlined above, the results of this research will provide information regarding social conditions that affect environmental attitudes,

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[4]Another weakness associated with the use of general environmental attitudes is the fact that there was less variation in general environmental concern than in specific concerns.

environmental behaviours and the relationship between attitudes and behaviour in a Canadian city, and will contribute to a clearer understanding of the motivations and barriers associated with environmental action for individuals.

The structure of this thesis will follow the format of a research article. Chapter 2, the Review of Literature, will set the stage for the study by tracing the evolution of environmental attitude and behaviour research, identifying gaps in the literature and issues that remain unresolved. This chapter will be comprised of an integrated discussion of theory and research findings that addresses the factors associated with both environmental attitudes and environmental behaviours as well as the relationship between the two. The theoretical framework employed will be based on contributions to the research problem made by social psychology, theories of self interest and rational choice, and knowledge from the area of social inequality. This framework combined with the results of empirical studies will inform the construction of models to be tested and aid in an explanation of the findings.

In Chapter 3, Research Design, Data and Methods, the models and hypotheses, based on the literature review and the available data, will be delineated and the exploratory and confirmatory aspects of the study outlined. This chapter will also include a description of the data and measures employed, and the statistical procedures used.

Chapter 4, Results, will outline the noteworthy findings of the study indicating the degree of support found for the various hypotheses, and offer interpretations of individual results based on previous research and theory. A discussion of the exploratory and confirmatory findings will also be addressed here.

Chapter 5, Conclusions, will provide a summary of the major findings, commenting on the implications and limitations of the study. Concluding comments will be made regarding the significance of the study and implied directions for future research.

CHAPTER 2
REVIEW OF LITERATURE

This chapter will follow the development of empirical findings and theoretical advancements in the areas of environmental attitudes and environmental behaviour. Factors associated with the relationship between attitudes and behaviour will also be addressed within this framework. As will become evident, much of the empirical research into both environmental attitudes and behaviour is highly descriptive and tending toward the atheoretical. The search for a theoretical framework within which to analyze the empirical findings led to several different areas of literature all of which had something to say about environmental attitudes and behaviour specifically or about attitudes and collective behaviour in general. The models to be tested and the analysis of results that follow are based on the proposition that aspects of each of the theories reviewed can contribute to an overall understanding of environmental attitudes, environmental behaviour and the relationship between the two.

Environmental Attitudes: Past and Present

Environmental Attitudes in the Past

The upsurge in support for the environmental movement in North America and Western Europe in the late 1960's prompted an increase in social scientific research aimed at tapping the extent of environmental concern among the public, and exploring the social bases of this concern by relating it to characteristics such as age, gender and class. Public opinion surveys in the late 1960's and early 1970's showed the level of environmental concern increasing dramatically, peaking around Earth Day celebrations in 1970, and then declining noticeably (Dunlap & Scarce 1991: 650; Buttel, 1987: 472; Dunlap & Dillman, 1976). This led to predictions that environmental problems would disappear from the public agenda, and to research that documented this decline (Downs, 1972; Dunlap & Dillman, 1976). The rationale behind these predictions was based on theories of self interest. Environmental concern was closely associated with the desire to improve quality of life, that accompanied rising living standards (Hays, 1987: 4, 12). The realization of the cost of environmental reform by business, employees and

consumers, was thought to account for the decline in concern in the early 1970's, and worsening economic conditions were believed to further contribute to this, especially among the economically vulnerable sectors of society (Downs, 1972; Dunlap & Dillman, 1976: 388; Morrison, 1986: 188-89; Jones & Dunlap, 1992: 33-34).

The fact that environmental concern appeared to be disproportionately concentrated among those with higher incomes, educational levels and occupational prestige lent support to the self interest theories and led to charges of elitism (Buttel & Flinn, 1974; Neiman & Loveridge, 1981: 759). It was reasoned that the relatively affluent and well-educated supporters of environmental reform had the luxury of focusing on the more aesthetic aspects of life, and were more insulated, given their occupations and income levels, from the direct regressive impacts of environmental regulation such as job loss and higher consumer prices (Morrison, 1986: 188; Van Liere & Dunlap, 1980: 183; Buttel, 1984: 8).

The charge of elitism and the contention that environmental concern was declining both began to be challenged in the late 1970's (Mitchell, 1979a; Morrison, 1986: 189; Buttel, 1987: 473). Although levels of concern did appear to decline in the early 1970's, they had stabilized by the mid 1970's, and environmental issues did not disappear from the public agenda (Lowe, Pinhey & Grimes, 1980; Mitchell, 1979a).

Further studies revealed that the only "class" variable that consistently predicted environmental concern was education (Van Liere & Dunlap, 1980: 190). In opposition to the elitism charge several researchers pointed out that disadvantaged groups and those in the working class do have a stake in environmental protection, given that they disproportionately experience not only the costs of environmental reform, but also those of environmental degradation (Buttel & Flinn, 1978; Berry, 1977; Neiman & Loveridge, 1981: 760). As Buttel and Flinn (1978: 435) stated, "blue-collar workers are clearly subjected to disproportionately large amounts of workplace pollution and working class families objectively possess the most impure and aesthetically displeasing residential environments".

Methodological and interpretational flaws in earlier studies that linked class to environmental concern were also cited. The evidence put forth in past research, it was

argued, was based largely on surveys of environmental organization members, and was not generalizable to the public at large (Buttel & Flinn 1978: 435; Mitchell, 1979a; Mohai, 1985: 820;). Reviews of empirical evidence concluded that age, education, urban residence, and political ideology were the only variables that consistently predicted modest levels[5] of variance in environmental concern (Van Liere & Dunlap, 1980; Buttel, 1987: 473-74; Lowe & Rüdig, 1987: 514). Younger, better educated, more liberal, urban residents were more likely to be concerned about environmental issues.

Current Environmental Attitudes

Public opinion surveys conducted in the 1980's recorded dramatically increasing levels of environmental concern. (Dunlap 1991: 10-14; Dunlap & Scarce, 1991: 652; Roper Organization, 1990; Bozinoff & MacIntosh, 1989). Since 1987 public concern about the environment has grown faster than concern about any other national problem in the United States (Roper Organization, 1990: V). By 1990 over three quarters of the American public believed the nation should make a major effort to improve the quality of the environment and over half believed that this should be done even if it meant sacrificing economic growth (Roper Organization, 1990: V, 1; Dunlap, 1991: 33). In Canada the numbers were similar. In 1990 73 percent of the population reported being very concerned about environmental issues, and 58 percent stated that protecting the environment was more important than creating jobs (Bozinoff & MacIntosh, 1991a).

There is conflicting evidence regard the degree of fluctuation in environmental support with economic conditions. Some Western European studies showed "worsening economic conditions led to dramatic swings in (post-materialist vs. materialist) value orientations ... in the 1970's" (Lowe & Rüdig, 1987: 517). In addition, Canadian polling data shows a drop in the number of people who are "very concerned" about the environment during the recession of 1991 and 1992 down to 62 percent in May 1992 (Bozinoff & MacIntosh, 1991b; 1992). However, concern was recorded as high as 74 percent in January 1991 and there are, as of yet, too few poll results to establish a trend.

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[5]Variance explained in studies of environmental concern rarely exceeded 10 percent (Buttel, 1987: 473; Van Liere & Dunlap, 1980: 193).

In support of the proposition that concern remains high regardless of economic circumstances, Jones and Dunlap (1992) report only modest fluctuations in an overall upward trend in environmental concern in the United States from 1973 to 1990 despite deteriorating economic conditions during this time.

Substantial variation in environmental attitudes does of course still occur when tied to specific issues where vested interests are at stake (Morrison, 1986: 205, 211-12; Hays, 1987: 307, 529; Francis, 1983). In Canada in 1987 for example, the Ontario Labour-Environment Co-ordinating Committee, made up of members of the Ontario Environmental Network and the Ontario Federation of Labour were mandated to continue work on a joint labour-environmental agenda of reforms. The committee ran aground after conflict erupted over the issues of uranium mining and nuclear energy as a result of the unions' concern about protecting existing jobs in those industries (Adkin, 1992: 146-47). However, most authors now agree that although there will be differences in the degree of concern across specific issues, broad public support for environmental protection and reform in general exists in North America (Dunlap, 1991: 12; 1989: 124; Morrison, 1986; Hays, 1988: 530; Bozinoff & MacIntosh, 1990; 1989; Roper Organization, 1990).

In addition to an overall increase in environmental concern among the public, some researchers in the 1980's also hypothesized that this would be accompanied by a diffusion of support throughout the populace such that clear or consistent patterns of support for environmental protection would become harder to find (Morrison, 1986). Recent studies, however, seem to indicate that variation in environmental attitudes remains correlated with education, political ideology, age, urban residence, and to a lesser degree, party identification[6] (Oskamp et al 1991; Howell & Laska, 1992; Jones & Dunlap, 1992). Gender, when tested in multiple regression equations, occasionally appears as a significant predictor of attitudes, with women exhibiting more concern, but

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[6] These results are based on American research findings, and generalization of the conclusions regarding the importance of political ideology and party affiliation, to the Canadian case, needs to be viewed with caution, given the different political choices open to Canadians. More will be said on this point in Chapter 3.

the magnitude of the effect is generally small (Jones & Dunlap, 1992). Race rarely produces any significant effects when considered in multivariate equations (Jones & Dunlap, 1992).

Although most researchers agree that age, education, political ideology and urban residence remain the most important determinants of environmental concern, there is some disagreement among those who have conducted longitudinal studies, regarding the relative importance of these variables as predictors of environmental concern over the last two decades. According to Howell and Laska (1992), who conducted a longitudinal study of attitudes in Michigan from 1980 to 1988, age and, to some degree, political ideology and party identification appear to have grown less important over the years in influencing environmental attitudes. They cite the increasing influence of the media, and the resulting widespread availability of information for all age groups, as an explanation for the declining importance of age. Their explanation for the continued relevance of education is also linked to media influence. Media information is more likely to reach and be retained by those with higher education. The Roper survey and report of 1990 supports this conclusion. This study found that the most dedicated environmentalists were highly educated and that these people reported the highest range of information sources and the least amount of confusion regarding environmental issues (Roper Organization, 1990: 55).

Jones and Dunlap (1992) take issue with Howell and Laska's results raising several methodological concerns. Jones and Dunlap's longitudinal study of the social bases of environmental concern in the United States from 1973 to 1990 using NORC data, concluded that the relative importance of the determinants of environmental concern have not changed substantially in the United States over the last two decades, and that age remains the strongest predictor.

The above results represent continued efforts to discern the demographic predictors of environmental concern. However, much of the research in the social sciences in recent years, rather than remaining focused on determinants of variation in environmental attitudes, attempts instead to explain why this issue has become an entrenched public concern. This research and the various theories associated with it also contribute to a

fuller understanding of the causes of environmental concern.

Theoretical Explanations for Widespread Environmental Concern

The various theories that have been put forth to explain the popularity of environmental issues retain the assumption of self interest on the part of actors, but differ with regard to where explanatory emphasis for attitude formation is placed. Like most sociological theories of attitudes, these models follow two different paths: those that emphasize social structure and common life situations and those that emphasize values and cultural change (Kiecolt, 1988: 383).

Cultural Change Theories

The cultural change theories advanced to explain widespread environmental concern revolve around the concept of post-materialist value change, the most influential proponent of which has been Ronald Inglehart (1977, 1990). Inglehart suggests that the economic security enjoyed by the post World War II generation of young adults in industrial societies, during their formative years, has resulted in a widespread shift in values away from economic and security concerns toward what Maslow characterized as higher order needs. These post-materialist values are then cited as being responsible for "system-level consequences" one of which has been the rise of widespread environmental concern as a life-style issue (Inglehart, 1990: 6, 373).

Post-materialist value change is closely linked with explanations that attribute the rise in environmental concern to the acceptance of a "new environmental paradigm"; one in which limits to growth and the interdependencies among all species are acknowledged. This is said to have arisen as a challenge to the dominant (anthropocentric) social paradigm under which economic growth, prosperity and a commitment to laissez-faire economics were valued (Dunlap & Van Liere 1978; Van Liere & Dunlap, 1983; Buttel, 1986b: 344-45; Lowe & Rüdig, 1987: 516).

The value change explanations emphasize psychological factors as the most important determinant of attitudes (Rohrschneider, 1990: 6). Values are seen as influenced by basic motivations and needs which, in post-industrial society, reflect non-economic quality of life concerns (Kiecolt, 1988: 391; Inglehart, 1990: 373). These values then influence specific attitudes and result in support for new social movements

such as the environmental one (Inglehart, 1990: 373).

Critics of the value change explanations, in addition to expressing concerns about tautology in explanations of the theory,[7] are sceptical of the significance of value change explanations taken on their own, given the danger inherent in this of dissociating environmental concern from real environmental problems (Rohrschneider, 1988: 350; Lowe & Rüdig, 1987: 516-18). Post-materialists, such as Inglehart, acknowledge that support for social movements does reflect the existence of objective problems, but do not focus on this as an important causal variable in attitude formation. Rather, Inglehart states, "the existence of problems ... would have no effect unless some value system or ideology motivated people to act" (1990: 371). Thus, in the value change models the initial stimulus in attitude formation lies within individuals (Rohrschneider, 1988: 350). Lowe and Rüdig (1987) argue that it is inappropriate to see the roots of new social movements in values as this neglects the structural context through which values are mediated. They maintain that "values abstracted from context are relatively meaningless" and that instead "analysis needs to understand how these aspirations and perceptions interact with changing environmental circumstances" (Lowe & Rüdig, 1987: 520).

Social Structural Theories

Opposing the value change theories for mass environmental concern are explanations for attitude formation that place the strongest emphasis on social structure and situational factors. These theories assume that psychological motivations based on self interest do influence attitudes, but place explanatory emphasis with the social context which shapes motivations (Rohrschneider, 1988: 348-50). Widespread environmental concern is thus partially explained by extensive public experience with concrete problems (Rohrschneider, 1988: 348; Uusitalo, 1990: 218; Dunlap, 1989: 118-19; Lowe & Rüdig, 1987: 518).

Theorists in support of this position provide several arguments to back up their

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[7]Problems of tautology arise when a measure of the degree to which people embrace non-material concerns, such as (but not restricted to) concerns about nature and the environment, is postulated, in turn, to be a cause of support for environmental reform.

stance. First of all, given the broad array of problems that are defined as environmental issues, the probability that individuals will be affected by one or more of these issues is high (Dunlap, 1989: 118-19; Mitchell, 1990: 88). There is also evidence to suggest that people believe environmental conditions are worsening (Dunlap, 1991: 14; Dunlap & Scarce, 1991: 654). Concern for quality of life has given way, in many cases, to concern about health issues, and life itself, for human and non-human species (Dunlap, 1991: 15). Thus, the diversity and intensity of real environmental problems as perceived by the public can itself provide an explanation for the widespread nature of environmental concern.

Also contributing to the widespread acceptance for environmental protection is the fact that although environmental reforms have had specific economic impacts, this effect has been localised, and the overall economic disaster predicted by environmental opponents in the 1970's has not materialized in a way that can be clearly tied to environmental protection (Morrison, 1986: 202).

An important factor in all of the previous explanations for widespread environmental concern is the effect of the media on public perceptions. Most researchers agree that the media has played a major role in the widespread dissemination of environmental concern (Lowe & Rüdig, 1987: 519; Mitchell, 1990: 88-90; Lowe & Morrison, 1984).

Media Influence

The amount and type of media coverage of environmental disasters and conflicts has helped transform many specific problems into a major public issue. "Journalistic preference for the negative and the dramatic", combined with the conflictual nature of debate between environmentalists and non-environmentalists, casts the overall message delivered to the public in a persistently negative light (Lowe & Morrison, 1984: 76-78; Hays, 1987: 247). As Lowe and Morrison (1984) point out, stories about environmental problems also carry with them powerful cultural symbols related to nature, and a strong emotive and moralistic appeal.

Helping to fuel the media's growing appetite for these accounts, are environmental organizations which recognize the importance of media coverage as a powerful lobbying

tool and often orient campaigns specifically to media interests (Lowe & Morrison, 1984: 82-85; Mitchell, 1990: 89). The fact that some environmental problems affect virtually everyone adds to the appeal of media stories and helps environmentalists to sustain both media and public attention (Dunlap, 1991: 15).

Members of the public themselves, when asked, identify television, radio and print media as their most important sources of information on environmental problems and issues (Roper Organization, 1990: 54). Further evidence of the impact of media coverage on public opinion can be seen in the public response to coverage of the Exxon Valdez oil spill in 1989. Media coverage of this event was extremely heavy and surveys immediately following the event found that those naming the environment as the most important problem facing the United States more than doubled, and those who believed the environment should be protected regardless of economic costs rose by 15 percentage points (Mitchell, 1990: 84 - 89).

Evidence of media impact on attitudes can also be found in industry's reaction to increased media attention. A media image that conveys public accountability has become more important to businesses and overt anti-environmental positions are most often avoided. (Dunlap, 1991: 12; Collins, 1991). Dow Chemical, a company with one of the worst industrial pollution records in Canada, has recently launched a new environmental campaign aimed at instilling environmental values in employees, establishing tougher environmental guidelines, and installing equipment to reduce the release of chemical waste. Management positions exist to oversee these new operations and to deal with public relations regarding environmental issues that arise from plant operations. One of the results of this campaign has been a new creed which hangs on management's walls: "perception is reality". This tenet is meant as a reminder to employees that public knowledge of chemical spills, regardless of how "miniscule" the spill, will result in public outrage (Collins, November 1991: 21-22).

There have been theoretical attempts, to explain the phenomenon of widespread environmental concern, which take into account the effect of values and structural conditions, while acknowledging that media influences both the substance and extent of cultural norms, and the perceptions of environmental problems among the public.

(Mitchell, 1990; Rohrschneider, 1990; 1988; Lowe & Rüdig, 1987). Models of environmental attitudes which combine value change and structural explanations, while requiring further research to test the relative strengths and positions of variables, have the potential to provide more comprehensive explanations for widespread environmental concern. As Kiecolt (1988), in a review article on attitudes and social structure points out, the relative effect of structural and cultural factors on attitudes remains an important question, and one not yet answered unequivocally by research. It is clear, however, that some cultural norms affect attitudes independent of social structure, and that individuals' social location and experiences have some effect on attitudes regardless of the dominant ideology (Kluegel & Smith, 1986; Kiecolt, 1988: 386, 398).

Some theorists deal with this problem by posing values as intervening variables, influenced by the social location and concrete experiences of individuals, and in turn, influencing public support for environmental protection (Rohrschneider, 1990: 20: Lowe & Rüdig, 1987: 520). Regardless of how one goes about it, it is evident that comprehensive theories of environmental attitudes need to be sensitive to the dynamic relationship between structure and culture, keeping in mind that values, which may influence specific attitudes and behaviours, are themselves created and sustained through actions which in turn are facilitated or constrained by structural conditions (Lowe & Rüdig, 1987: 520).

Synopsis of Attitude Research

In summary, the literature on environmental attitudes reveals the existence of widespread and enduring concern among the public. Attitudes remain connected to the variables of education, age, urban residence, and political ideology (although the relative strength of these relations may have shifted somewhat over the years), and these variables continue to explain only modest amounts of variance.

Explanations for the broad support of environmental issues include those theories which highlight extensive value change in post-modern society, those which focus on individuals' experiences and the existence of widespread environmental problems, those which look at the influence of the media, and various combinations of these. Further research in this area is needed help to elucidate the relative effect of these factors and the

inter-connections between them.

Both the value change and structural theories that have arisen out of the attempt to explain the phenomena of public environmental concern suggest variables that can contribute to the list of previously identified demographic variables (age, education, political ideology and urban residence) in models attempting to explain environmental attitudes. These include the effect of cultural values and norms, the influence of the media, and individuals' perception of the impact of environmental problems in their lives.

For an increasing number of researchers, however, continuing to pursue explanations of environmental concern, which is generally accepted to be widespread, is secondary to examining the strength of public commitment to environmental quality as measured by the actual behaviour people are willing to engage in to solve environmental problems (Dunlap, 1991: 16; Uusitalo, 1990; Roper Organization, 1990). Research in the United States shows that regardless of the existence of high levels of "green" attitudes, this concern does not, for the most part, translate into environmental action (Roper Organization, 1990: 31). This gap is related to the issues of salience and strength that arise in attitude literature.

The Salience and Strength of Environmental Concern: Wide But Not Deep?

Salience; the prominence of an issue, and strength; the intensity of concern, are important and related considerations in assessing the impact and consequences of public concern (Mitchell, 1990: 83-84; Dunlap & Scarce, 1991: 652). Although most people, when asked, will say they are concerned or very concerned about environmental issues, this is not necessarily an indication of how strongly they feel about environmental problems in the context of other issues and concerns.

The most common measure used to try to determine if environmental issues are salient, or "on the minds" of individuals, is the "most important problem" question (Dunlap, 1989: 124). People are polled and asked to voluntarily identify the most important problems facing the nation. Using this indicator, environmental issues have more than doubled in salience since 1988 (Mitchell, 1990: 84). According to polls conducted by Cambridge, in 1990 the percentage volunteering "environment" as one of the two most important problems facing the United States rose to a high of 23 percent.

Gallup polls, however, show that in 1990 less than 10 percent volunteered "environment" as the single most important problem facing the nation (Dunlap & Scarce, 1991: 659).

Canadian data from 1989 to 1992, which covers the recession of 1991-92, shows that although the percentage of people claiming to be very concerned about environmental issues remained high throughout this period (62 percent to 78 percent), the percentage of people identifying the environment as the most important problem facing the country fell from a high of 17 percent in 1989 to a low of two percent in 1991.[8] The percentage identifying unemployment and the economy as the most important problem rose sharply during this same period (Bozinoff & MacIntosh, 1991b; 1992).

Some researchers have questioned the validity of measures of salience using "most important problem" indicators. Mitchell (1990: 84) points out that these measures are headline sensitive, and the major issues that dominate the media at any given time such as drugs, AIDS and economic problems are most likely to be volunteered as most pressing by respondents. This is not, he believes, a trust-worthy guide to how the public will respond to policy changes in issues not commonly identified in "most important problem" questions.

Dunlap (1989: 125) believes "most important problem" indicators are too stringent a measure of salience, given that reliance on this data in the past has suggested that fewer people are attentive to environmental problems than are active in environmental organizations, an absurd conclusion in his view. He proposes that the relative importance of environmental problems also be considered in measures of salience, by having people rank a list of important problems identified by the researcher. In surveys using this type of indicator in the United States, environment ranked eighth out of 11 identified issues in 1987, and fourth out of 12 issues in 1990 (Roper Organization in Dunlap & Scarce, 1991: 659).

The strength of environmental concern is more difficult to determine. Some researchers hold that the increasing public support for environmental protection regardless

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[8]In 1992 the percentage who identified the environment as the most important problem rose to three percent.

of the social cost, is itself an indicator of the strength of concern (Mitchell, 1990: 85). Others suggest that questionnaire items which first ask people to express an opinion, and then indicate how strongly they feel about it, will provide a more realistic picture of the commitment people have to environmental protection (Dunlap, 1989: 129).

Measures of behaviour would appear to be the most stringent indicator of commitment to environmental quality. As will be shown, the extent of environmental behaviour when compared with environmental concern calls into question the salience of environmental attitudes and, in so doing, the strength of public commitment to environmental protection.

Environmental Behaviour: Prevalence and Predictors

Most early studies of environmental behaviour focused on membership in, or active support of, environmental organizations. Here, survey results were analyzed in order to relate demographic factors to the composition of environmental groups (Buttel, 1987: 476). Measured in this way, environmental activism, unlike environmental concern, was clearly linked, along with many other forms of political activism, to socioeconomic status (Buttel, 1987: 474; 1986: 224; Mohai, 1985; Morrison & Dunlap, 1986; Mitchell, 1979a). Simply considering membership in environmental groups, however, results in a very narrow definition of environmental behaviour. Recently attempts have been made to expand this definition in research designs.

Dunlap (1991) identifies two major types of environmental behaviours: those which focus on individual responsibility and those which emphasize political action. Individual changes in lifestyle include such things as ecologically responsible consumer choices, recycling, and energy saving behaviours. Political behaviours can include voting decisions, letter writing, consumer boycotts and contributing money to, or volunteering for, environmental organizations. Research on these new types of environmental behaviour that extend beyond membership in environmental groups, has only recently begun to be carried out[9] and results are sketchy.

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[9]A small amount of research on individual environmental behaviours, especially with regard to consumerism and recycling, did occur in the 1970's. See for example

The extent of self-reported environmental behaviours, most notably those which fall in the realm of individual responsibility, appears to have increased in recent years (Dunlap & Scarce, 1991: 656-57, 670-72; Dunlap, 1991: 33-34). Not surprisingly the specific types of behaviours that are most popular tend to be those that require minimal effort and personal cost (Dunlap & Scarce, 1991: 657). For example, there is a substantially greater reluctance on the part of consumers to address the issue of auto exhaust, by car pooling, using public transit, and supporting legislation that restricts the use of automobiles, than there is to address this same issue by supporting changes that would not require any behavioural change on their part (i.e. education and provision of better public transport) (Uusitalo, 1990: 222). Dunlap (1991: 34) also points that although majorities consistently support legislation to deal with air pollutants and waste management through banning of harmful products and mandatory recycling, restrictions on the use of automobiles typically fails to receive majority support.

Specifically, reports of the actual amount of environmental behaviour occurring among the public vary. Cambridge Reports show 84 percent of Americans surveyed in 1990 report some type of recycling, and slightly lower numbers reported changing consumer behaviour (Dunlap & Scarce, 1991: 672).[10] However, frequency and quantity of behaviours also need to be considered in the attempt to assess the behavioural commitment to environmental quality. The Roper Organization (1990), by asking which behaviours were done on a regular basis, found that only 46 percent of Americans surveyed recycled bottles or cans and only 26 percent recycled newspapers. Environmentally conscious consumer behaviours in this same survey were reported by seven percent to 25 percent of the sample, depending on the behaviour in question. In contrast to these behaviours, only eight percent reported contributing money to

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McGuinness et al., (1977) and Webster (1975). These were conducted in response to the "voluntary simplicity" movement of the 1970's in the United States which became unfashionable again during the Reagan era (Dunlap, 1991: 33).

[10]Most of the information on environmental behaviours is based on reported rather than observed behaviour and may be upwardly biased as a result (Schuman & Johnson, 1976: 164-65).

environmental groups on a regular basis, eight percent reported reduced use of automobiles, and four percent claimed to write letters to politicians (Roper Organization, 1990).

The results of these surveys have been interpreted differently as well. Cambridge Reports (in Dunlap, 1991: 34) argues that a 'sea-change in the market-place' as represented by green consumerism, is occurring. The Roper Organization, on the other hand, while acknowledging "a high level of 'green attitudes'" exists among the American public, concludes that "judged by their actions ... pro-environmental Americans are a minority today - only 22 percent of the public" (p. 31).[11]

Dunlap (1991: 33) reached similar conclusions with regard to the effect of public environmental concerns on voting behaviour. After assessing evidence of self-reported voting intentions and exit poll results in the United States, he states "there is as yet little evidence of a 'green bloc' of single-issue voters comparable to the anti-abortion or anti-gun control blocs". Reagan's overwhelming electoral victory in 1984, despite his anti-environmental agenda and high levels of public environmental concern, lends support to this contention (Dunlap, 1989: 130-31; 1991: 32).

Some attempts have been made to explain the variance in various types of environmental behaviour with demographic indicators. Thus far, the most important correlates of environmental behaviour in general appear to be income, education and gender (Roper Organization, 1990: 49-57). People with high incomes and education levels are more likely to engage in some type of environmental behaviour and, similarly, women are more likely than men to take some type of environmental action. Age is not a significant predictor of environmental political activism (Mohai, 1985: 824). Where age has been found to correlate with individual environmental behaviour, it is generally in the direction opposite of it's correlation with environmental concern (Uusitalo, 1990: 220-21; Van Liere & Dunlap, 1981: 666). While younger people express more concern

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[11]Based on a cluster analysis which identified five segments in the American population. The analysis took into account amount and types of environmental behaviour, and the relationship between attitudes and behaviour (Roper Organization, 1990: III, 32).

about environmental degradation, they are less willing than their older counterparts to take action to address their concerns. Political ideology does not appear to be a factor in environmental behaviour, at least not in the United States (Roper Organization, 1990: 36, 48). Urban residence is a factor in most types of environmental behaviours, given that environmental groups and programs are generally located in urban areas.

Studies show that although environmental attitudes are generally positively and significantly correlated with environmental behaviours, this association is weak (Uusitalo, 1990: 223; Oskamp et al., 1991: 497). This is in line with other attitude-behaviour findings in social psychology. Attitudes are usually weakly connected to behaviour unless very specific attitudes are used to predict the same specific behaviour (Ajzen & Fishbein, 1980; Weigel & Newman, 1976; Oskamp et al., 1991: 497). Mohai (1985) also found that the environmental attitude-behaviour relationship can be increased if attitude strength is taken into consideration by asking people to report on the intensity of their attitudes or rank them in relative importance.

Recycling, the most prevalent individual environmental behaviour, has been the focus of several studies. The results of these studies suggest that recyclers deviate somewhat from the demographic profile outlined above. Levels of participation in recycling programs have been found to be positively related to general environmental concern, income, occupational status, liberal ideology, age and being female (Webster, 1975; Weigel, 1977; McGuinness et al., 1977; Vining & Ebreo, 1990). Many of these results, however, were obtained in the 1970's, a time when recycling was far less common than it is now; they have not proven to be consistent across time. Rather, recent studies suggest that the most useful predictors of recycling appear to be found in what Oskamp et al. (1991) refer to as contextual factors (Oskamp et al., 1991: 497, 500).

Variables which fall under the rubric of contextual factors include convenience of behaviour, knowledge of environmental issues, social network variables such as family composition, and social-psychological variables such as neighbours' expectations and behaviour, sense of personal efficacy, and degree of intrinsic satisfaction associated with the behaviour. Following this it is not surprising that studies have found convenience to be significant factor in people's decisions to recycle and the availability of recycling

collection depots and curbside programs to be a strong predictor of recycling behaviour (Vining & Ebreo, 1990; Oskamp et al., 1991: 499).

Knowledge of environmental issues has also proven to be an important factor. Vining and Ebreo (1990) found that recyclers were better informed overall than non-recyclers and that education level was related to the types of information sources used[12]. In addition to knowledge about why environmental behaviour is important, De Young (1989) suggests that specific information about how to perform the behaviour is also often required.

In examining some social network variables, Oskamp et al. (1991) found that the presence of children in the house failed to discriminate between recyclers and non-recyclers[13], but recycling behaviour by neighbours did discriminate between the two groups. Hopper and Nielsen (1991) also found that the most effective intervention strategy to encourage recycling was the existence of block leaders who promoted recycling behaviour in their neighbourhoods.

Oskamp et al. (1991) point out that curbside recycling programs address many of the issues identified above. They alleviate problems of convenience, and lack of knowledge of recycling procedures. They also increase the influence of peer participation and modelling (Oskamp et al., 1991: 514-15). It is reasonable to expect that the strong influence of these factors would set curbside recyclers apart from other environmental actors by diminishing the effect of other demographic and attitudinal predictors, and this

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[12]Highly educated respondents were more likely to have received information from newspapers while less educated individuals were more likely to have received their information from television (Vining & Ebreo, 1990: 67).

[13]The rationale for the inclusion of children in this study was not elaborated upon, but two possible effects of this variable come to mind. First, concern about the effects of environmental degradation on future generations of children is a theme expounded upon in the presentation of environmental issues by environmental organizations and the media. Thus presence of children in the home may be expected to increase environmental concern and behaviour. However, presence of children in the home may also detract from the resources of time and money needed to engage in environmental action.

is consistent with Oskamp et al.'s findings.

Finally, several studies, through an examination of locus of control factors and belief in the ability to make a difference, suggest that a personal sense of power and efficacy contribute to recycling behaviour and pro-environmental behaviour in general (De Young, 1986; Huebner & Lipsey, 1981). De Young's (1986) results also suggest that people do derive distinct intrinsic satisfactions, relating to frugality and community participation, from recycling behaviour.

Further investigation of the effect of these contextual or situational variables can not only add to an understanding of the motives and constraints associated with recycling, but also has the potential to increase the understanding of environmental attitudes and other types of environmental behaviour. It is reasonable to expect that variables such as knowledge of issues, concern for children's health and future, and a personal sense of efficacy may not only affect recycling and other types of environmental behaviour directly but also indirectly through attitude change.

More research is needed in the area of environmental behaviours in order to elucidate the extent and type of behaviours people are willing to engage in and the barriers to action that exist for individuals. The distinction between types of environmental behaviours also needs to be attended to. As is suggested by the results of Tracy and Oskamp (1983), environmental behaviours may not necessarily be linked by any underlying factor of concern, and different behaviours may be associated with different predictor variables. On the other hand, the contextual variables being tested in recent recycling studies, may inform future research into environmental attitudes and other types of environmental behaviours.

There have been several theoretical attempts to explain why only a minority of people act on their environmental concerns and to distinguish between those who act and those who do not. These explanations, which build upon research findings and inform variable selection in current studies, are drawn from a broad range of social scientific thought. Both those theoretical explanations that have been tailored specifically to environmental behaviour, as well as broader areas of research and theory that provide insights into this phenomena, are outlined in the following section.

Theoretical Explanations for Environmental Behaviour

Traditional Social Psychological Explanations and Their Critiques

An investigation of social psychological research is particularly illuminating for addressing the incongruence between attitudes and behaviour, given the long history of debate this issue has seen in social psychological literature. LaPiere's now famous 1934 study into the attitude-behaviour relationship raised the very real possibility that there was virtually no agreement between attitudes and behaviour. Schuman and Johnson (1976) point out that research since LaPiere has shown that this is clearly not the case. Rather, the level of congruence found between attitudes and behaviour depends on the behaviour studied and the features associated with it (p. 166-170). However, in most empirical studies where an association is found between attitudes and behaviours, the relationship remains rather low (Uusitalo, 1990: 213).

Studies aimed at better explaining the attitude-behaviour relationship in social psychology focused on improving measurement and theoretical modelling. Following this it was found that the attitude-behaviour relationship could be improved if attitudes and behaviour were measured at the same level of specificity, if strength of attitudes were considered, and if behavioural intentions, situational factors and reference groups were included in models explaining behaviour (Schuman & Johnson, 1976; Weigel & Newman, 1976; Frideres, 1971).

Ajzen and Fishbein (1980) developed an attitude-behaviour model that consolidated the above recommendations. Their recursive path model incorporated the three traditional components of attitude (affect, cognition and conation[14]), and the influence of subjective norms. Behaviour, in this model, was influenced most directly by behavioural intentions. Behavioural intentions, then, which were a mediating factor in this model, were proposed to be a function of the evaluative component of attitudes and subjective norms which, in turn, were influenced by beliefs about the consequences

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[14]The affective dimension reflects an affective evaluation of an attitude object, the cognitive dimension reflects beliefs about an object and the conative dimension refers to behaviourial intentions (Kiecolt, 1988: 383).

of behaviour and beliefs about the social expectations of others.

Liska (1984), in a critique of this model, points out that Ajzen and Fishbein acknowledge that the model is only applicable for behaviour which is under volitional control, defined as "behaviour which does not require skills, abilities, opportunities and the cooperation of others" (Liska, 1984: 63). Liska argues that this is rarely the case. Rather, he posits that most behaviour ranges on a scale from volitional to involitional. He acknowledges that Ajzen and Fishbein's model may accurately predict behaviour in cases where there is a wide range of intentions, and resources (skills, opportunities and social cooperation) are relatively constant, but believes that variations in resources may be the best predictor of behaviour when there is little variation in intentions relative to variations in resources. Thus, people who are constrained by a lack of resources and opportunities may not do what they intend to do.

Other researchers, as well, have suggested that the absence of structural constraints leads to greater attitude-behaviour consistency (Heberlein & Black, 1981). With this in mind, Liska proposed a reformulation of the Ajzen-Fishbein model, to include both volitional and involitional behaviour, in which social structure is conceptualized as a background variable. In his words, "social structure is important because it allocates resources and opportunities, which directly influence behaviour and which provide the medium through which attitudes, subjective norms and intentions are expressed in behaviour" (Liska, 1984: 72).

In a related conceptualization of the attitude-behaviour relationship, Inglehart (1990: 383-84) proposes a model of support for the environmental movement that conceptualizes behavioural intentions as falling on a continuum between attitudes and behaviour. The differences between predictors of attitudes and behaviours in his model are partially explained by the fact that attitudes represent a "'soft' indicator that contains a large component of spur of the moment response" and behaviour a "relatively 'hard' indicator that refers to specific activities one either has or has not done." Behavioural intentions fall somewhere in between and the causal variables related to it are expected to reflect this.

Social psychological theories, and subsequent critiques and revisions, have

influenced much of the research into the incongruity between environmental attitudes and behaviour. Social psychological perspectives have also been applied to explanations of participation in social movements, and specifically to membership in environmental organizations. Although these explanations refer to collective action, they provide insights that can be applied to an understanding of individual environmental behaviour as well.

Social psychological explanations for participation in environmental organizations focus on motivational concepts such as cumulative or relative deprivation experienced personally by the individual in society (Mohai, 1985: 822). People who disproportionately experience the effects of environmental degradation or fear the loss of environmental quality relative to their expectations, would thus be motivated to participate in environmental organizations or take action individually.

Another motivational variable that is discussed in social psychological theory is concept of personal efficacy. This concept relates to an individual's belief in his or her own ability to make a difference (Mohai, 1985: 823). As would be expected, people with high efficacy are more likely to become involved in social movements in general and environmental activism in particular (Mohai, 1985: 823; Huebner & Lipsey, 1981: 46). Studies have been undertaken which relate class factors such as education and occupation to subjective political powerlessness and psychological well being in general (Grabb, 1988; Archibald, 1978: 123-85). Advantaged groups have more resources and relatively more success in pursuing their interests and thus experience a greater sense of personal power in their lives. It is not surprising then, that Samuel Hays, in documenting the history of environmental politics in the United States, found that "public action was often frustrated by the lethargy of the less affluent who were often far less interested in the very environmental conditions others considered a threat. Successful urban environmental action seemed to require affluence, interest, awareness and knowledge ... not widely present in the low-income urban areas." (Hays, 1987: 269).

A more structural response to social psychological explanations for social movement participation is found in resource mobilization theory. This theory of collective action compliments social psychological explanations of relative deprivation and

it, as well, utilizes concepts which can contribute to explanations of individual environmental action.

Resource Mobilization Theory

Resource mobilization theory represents the major direction taken by North American social movement theorists and has been employed by past environmental behaviour researchers to provide an explanation for participation in environmental organizations (Canel, 1992: 22; Buttel, 1987: 477). This theory expanded on relative deprivation explanations for support of social movements by stipulating that the existence of inequality and unmet expectations were not enough to account for the rise of a social movement. The emergence of a social movement would also depend on the availability of group resources and opportunities (Canel, 1992: 24). Taking these conditions as given, resource mobilization theory goes on to analyze the organizational strategies and dynamics that characterize social movement relations (Canel, 1992: 38-39).

The assumptions underlying resource mobilization theory suggest potential explanations for individual environmental action as well. Specifically just as social movement mobilization requires both perceptions of relative deprivation and the availability of resources at the group level, appropriate environmental attitudes, on their own, may not be enough to produce individual environmental action. The opportunities and resources necessary to act on those concerns may also be required.

Resource mobilization theory, which is based on an assumption of self-interested rational choice, was influenced by the reconceptualizations of interest group and social movement theory that followed the publication of *The Logic of Collective Action* by Mancur Olson in 1965 (Mitchell, 1979b, 87-88). Other variants of rational choice theory following Olson have had a direct impact on the study of environmental behaviour. Suggestions have also been made that rational choice theory, a micro theory of action, be situated within a broader context of structural inequality in order to extend an understanding of environmental behaviour (Lowe & Rüdig, 1987: 523). The following overview of rational choice theory, as it pertains to environmental action, will also include a discussion of how to incorporate notions of rational choice and social inequality to help provide an understanding of environmental behaviour in this study.

Rational Choice Theory

Rational choice perspectives are based on conceptions of individuals as purposive actors who, when confronted with constraints which derive from the scarcity of resources and the costs associated with various courses of action, weigh the alternatives and make rational decisions based on maximization of utility (Friedman & Hechter, 1988: 202; Pescosolido, 1992: 1100). Starting with this perception of individual action, and with insights concerning the nature of collective goods, rational choice theorists go on to develop a theory of collective action which adds to an understanding of environmental behaviour.

Most elaborations of rational choice theory as applied to environmental action have their origins in Olson's work on group behaviour (Smith, 1985: 133; Lowe & Rüdig, 1987: 523). According to Smith (1985: 132), Olson's theories provided a major challenge to pluralist explanations for interest group support. Pluralist theories proposed that support of group goals by an individual was the major explanation for joining a group. Olson on the other hand, while making the assumption that individuals acted rationally to maximize utility, maintained that selective incentives were necessary for individuals to lend support to interest groups (Smith, 1985: 132). This is due to the nature of environmental quality as a collective good. "The rational, utility-maximizing person, it is argued, will not be inclined to help achieve a group benefit which will then be enjoyed equally by those who do not contribute" unless separate individual incentives exist (Mitchell, 1979b: 89-90). Uusitalo (1990: 213) refers to this as the "individual utility versus collective welfare dilemma".

Thus, according to rational choice theorists, the paradox of collective versus individual good leads to the tendency of economic actors to free-ride and enjoy collective benefits without engaging in the co-operative behaviour necessary to bring them about. As Uusitalo (1990) points out, in the case of environmental behaviour, this is associated with the economic nature of capitalist societies. The market mechanism in these societies does not, on its own, provide incentives for the protection of common goods. For example, consumer choices, which may increase the welfare of individual purchasers, can bring about unintended environmental damage overall (Uusitalo, 1990: 212). In this

case, preferences for environmental quality and choices based on self interest are inconsistent and although people may be genuinely concerned about environmental protection, their individual actions bring about environmental damage as an unintended consequence.

Given the nature of environmental quality as a collective good and following a rational choice analysis, individuals cannot be expected to participate in environmental action as long as they can "reap the fruit of cooperation by others and/or cannot reckon on others following (their) example" (Hirsch, 1976: 144). According to rational choice theorists, overcoming the free rider problem and obtaining the co-operative behaviour necessary to achieve the collective good, requires that positive individual incentives or benefits associated with participation, negative or coercive individual incentives in the form of increased costs for non-compliance, or internalized social norms, be present (Hirsch, 1976: 144; Mitchell, 1979: 90). The extent to which collective action occurs with regard to a given issue will thus depend on an individual's assessment of likelihood of others to cooperate and the degree to which incentives, disincentives or internalized social norms exist.

Since Olson's theory of collective action appeared, rational choice theorists have suggested that additional economic and non-economic considerations be added to the calculus of individual costs and benefits that go into the decision to participate in environmental action. Several theorists have suggested that non-economic motives for participation such as altruism, status, prestige, moral beliefs and a sense of togetherness and purpose are not only applicable to small groups as Olson suggested, but also play a part in people's decision to participate in environmental lobbies (Smith, 1985: 134; Mitchell, 1979b; Wilson in Lowe & Rüdig, 1987: 524). An example of this type of formulation is found in Raymond De Young's (1986) study of the satisfactions associated with recycling. De Young concluded that people who recycled derived distinct intrinsic satisfactions from their behaviour. These satisfactions were related to the chance to make a difference, participate in the community, and avoid waste.

One of the first to expand the notion of economic incentives and disincentives with regard to environmental behaviour was R.C. Mitchell in 1979. Mitchell argued that

environmental collective goods (or bads) are themselves a source of motivation for individuals, especially for those who suffer from the immediate consequences of pollution or environmental degradation. In other words, Mitchell argued, the potential costs of not participating (continued or worsened environmental conditions) may be greater than the time and money it takes to contribute to environmental lobbies (Mitchell, 1979b: 98-100). Jones and Dunlap (1992: 44-45) make reference to a similar notion when they suggest that fear of perceived health hazards may override barriers to environmental activism that exist among lower socioeconomic groups.

Rational choice theorists have also proposed that feelings of insignificance and limited efficacy can increase free riding, while the effectiveness of environmental organizations in convincing people that their individual actions can make a difference will increase the likelihood of participation (Uusitalo, 1990: 214; Mitchell 1979b: 120).

As Lowe and Rüdig (1987: 523) point out, the fact that the rationality of behaviour is difficult to test empirically, and the fact that almost any action can be characterized as rational after the fact, leads to charges of tautology by critics of rational choice theory. Regardless of this, however, assumptions that individuals or groups behave in a rational and self-interested fashion are implicit in a great many social scientific theories (Coleman, 1990: 5)[15]. The present research concurs with Lowe and Rüdig that the explicit expression of these assumptions in rational choice theory can contribute to an understanding of environmental behaviour if attention is directed to "the personal costs of participation and their varying significance for different social groups" (p. 523).

Rational choice theory has traditionally taken structural constraints as given and has stipulated that among the set of feasible actions that exist within structural boundaries, people will choose the behaviours they believe will bring the best results (Elster, 1982: 464). What Lowe and Rüdig suggest is that this analysis be extended to make structural

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[15]Lowe and Rüdig (1987: 581, 524) point out that an assumption that social movement participation is associated with irrationality, as can be found in some American sociology, results in researchers ignoring the impact of real environmental problems on attitudes and behaviour.

constraints explicit by acknowledging that the costs associated with environmental behaviour are greater for some social groups than they are for others. The studies of environmental behaviour that include class variables are based on this assumption. As Morrison and Dunlap (1986: 583) point out, the time, money, knowledge and experience necessary for collective action will, by definition, be found among the more privileged. Given reports of lethargy and lack of interest among the disadvantaged regarding political action[16], it makes sense that energy should also be added to this list of resources, and would be related to the relative shortage of time and money, and the psychological distress and feelings of powerlessness that accompany economic disadvantage.

The analysis completed by the Roper Organization in 1990 also supports a combined rational choice and class analysis of environmental behaviour. Using cluster analysis this study identified five distinct segments of Americans based on their attitudes and behaviour. The group most dedicated to all types of environmental behaviour had above average socioeconomic status and disproportionately higher numbers of older people, women, and part-time workers which Roper relates to relatively more available time to devote to environmental activities (Roper Organization, 1990: 34). The group most likely to make monetary contributions to enhance environmental protection but less likely than the previous group to practice almost any environmental activity that required direct, individual efforts, was a younger group, more of whom were employed. This group ranked highest in income level, but relatively more of their time was taken up with employment activities (pp. 37-39). The largest and least environmentally active of the five groups was characterized by those who had the lowest mean incomes, lowest levels of education, highest percentage of blue collar workers and the least exposure to all kinds of information about the environment (pp. 45-47).

Thus, the personal costs of participation in environmental activities would appear to be relatively higher for the socially and economically disadvantaged. They have less time, money and energy to devote to environmental causes and any resources donated to environmental behaviour may detract from resources available to deal with the other

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[16]See Hays (1987: 269).

social and economic concerns that they encounter. This group would also be less likely to expend the effort required to gain access to the necessary information to participate given their relative information deficits, and lower levels of personal efficacy and interest. The benefits of participation or the costs of not participating, it would follow, would have to be somewhat higher for this group to encourage the same level of participation as would be expected from those with more resources.

Rational choice analysis can thus be used to understand both the personal costs associated with participation in environmental activities in general and in an explanation of environmental behaviour that varies on the basis of class[17]. The notion of the unintended consequences of behaviour and the free rider phenomena characteristic of collective action can also be used to help explain the failure of high levels of concern to translate into corresponding behaviour.

Applications

The upcoming models proposed to test the predictors of general environmental concern and specific environmental behaviours, and to explore the predictors of the consistency between attitudes and concern, where made possible by survey questions, incorporate variables that are suggested by research and theory in the area of environmental attitudes, past empirical findings regarding environmental behaviour, social psychological theory, class analysis[18] and rational choice theory. Following the

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[17]This combination of rational choice theory and class analysis can also be found in the theorizing of rational choice Marxists such as Jon Elster (1982) and John Roemer (1986). They use rational choice theory, and in particular, game analysis, as a tool for explaining the micro-foundations of a macro class analysis. In other words, rational choice theory is employed in the establishment of the micro-foundations for "behaviour which Marxists think are characteristic of capitalism" (Roemer, 1986: 192).

[18]Incorporation of class analysis will be done using both traditional measures of class and individual perceptions of mobility. The use of both measures of class is based loosely on the distinction Wright and Shin have made between processual and structural views of class and their attempts at integration (Wright and Shin, 1988). Processual views of class refer to the effect of cultural and personal experiences on class identity over time while structural views refer to current objective realities which

critiques, developments and suggestions that have arisen in all these areas regarding the tension between the placement of explanatory primacy with individual psychological levels of analysis (attitudes, values, and beliefs), or with individual experiences with the social structure (resources and opportunities), both levels of analysis will be included in the models with structural and perceptual variables hypothesized to affect behaviour both directly and indirectly through individual attitudes.

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determine class location.

CHAPTER 3
RESEARCH DESIGN, DATA AND METHODS

Models and Hypotheses

The models proposed to test the socioeconomic, demographic, contextual and perceptual influences on environmental concern, consumer behavioural intentions, recycling behaviour, and consumer attempts to purchase organically grown food are outlined in Figures 1 through 3. Three behaviours were chosen for study in order to allow comparison between behaviours. The available data restricted the choice of behaviours for study to individual environmental lifestyle choices.

The rationale behind the inclusion of explanatory variables will be discussed in this chapter in conjunction with the delineation of hypotheses. Following the format of the literature review, hypotheses relating to environmental attitudes will be outlined first, followed by hypotheses relating to environmental behaviours. The rationale for the model designs will be incorporated in these discussions and later summarized. Although measurement considerations will enter into the discussion of hypotheses, specific measurement of variables will be described in the data and methods section. A discussion of a model to examine the influences on attitude-behaviour consistency, and the method for validation of hypotheses with comparable data, will also be outlined under data and methods given the exploratory and confirmatory nature of these projects respectively.

Model Considerations and Hypotheses Regarding Environmental Attitudes

As outlined in the literature review, age, education, and political ideology have been found to be consistent predictors of environmental attitudes. It is expected that younger age, higher education and liberal political views will predict greater general environmental concern. Urban residence, the other consistent influence on environmental attitudes, is controlled for by virtue of the urban sample used for this study.

Political party identification was also included in the models as a predictor of environmental attitudes. Although American studies have shown associations of environmental concern with political party identification (Republican or Democrat) to be weaker and more inconsistent than associations with political ideology, there is reason to

FIGURE 1

ESTIMATED MODEL FOR CONSUMER BEHAVIOURAL INTENTIONS - MODEL 1

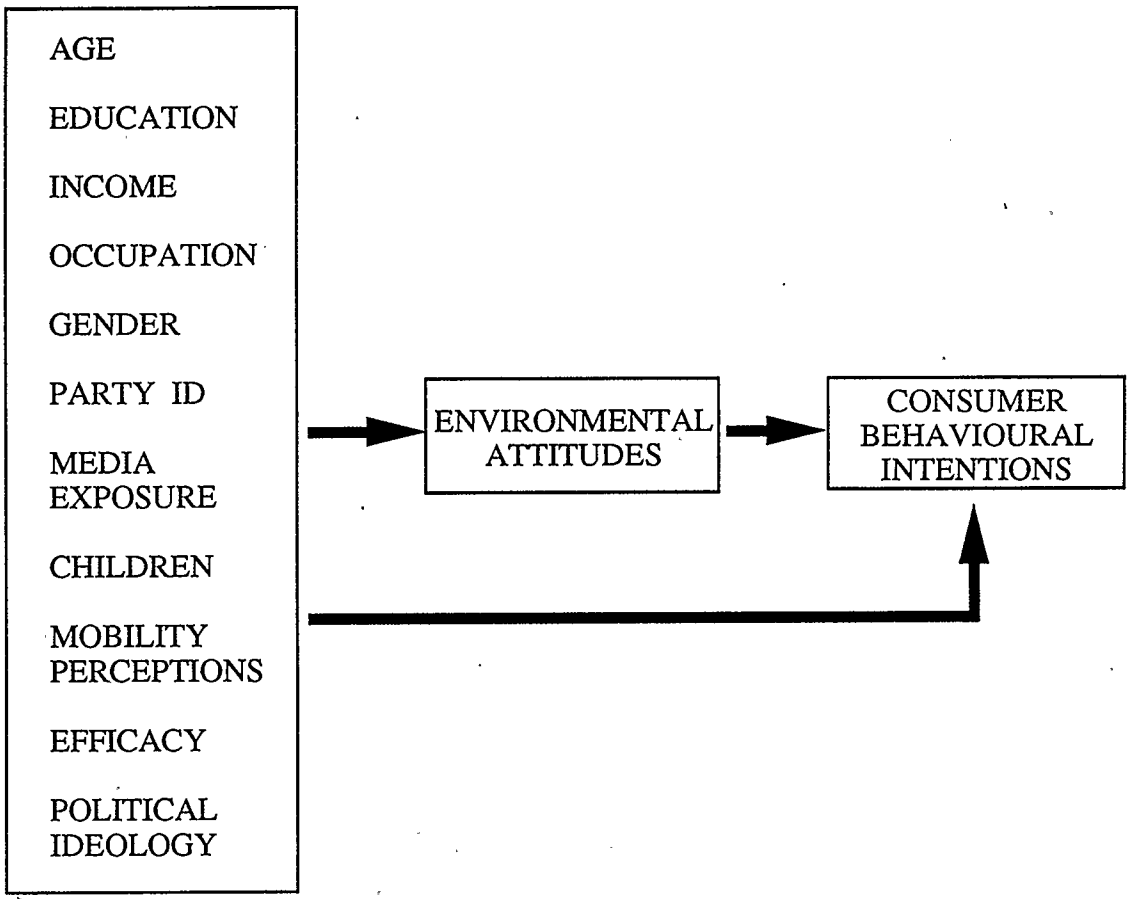


FIGURE 2

ESTIMATED MODEL FOR RECYCLING BEHAVIOUR - MODEL 2

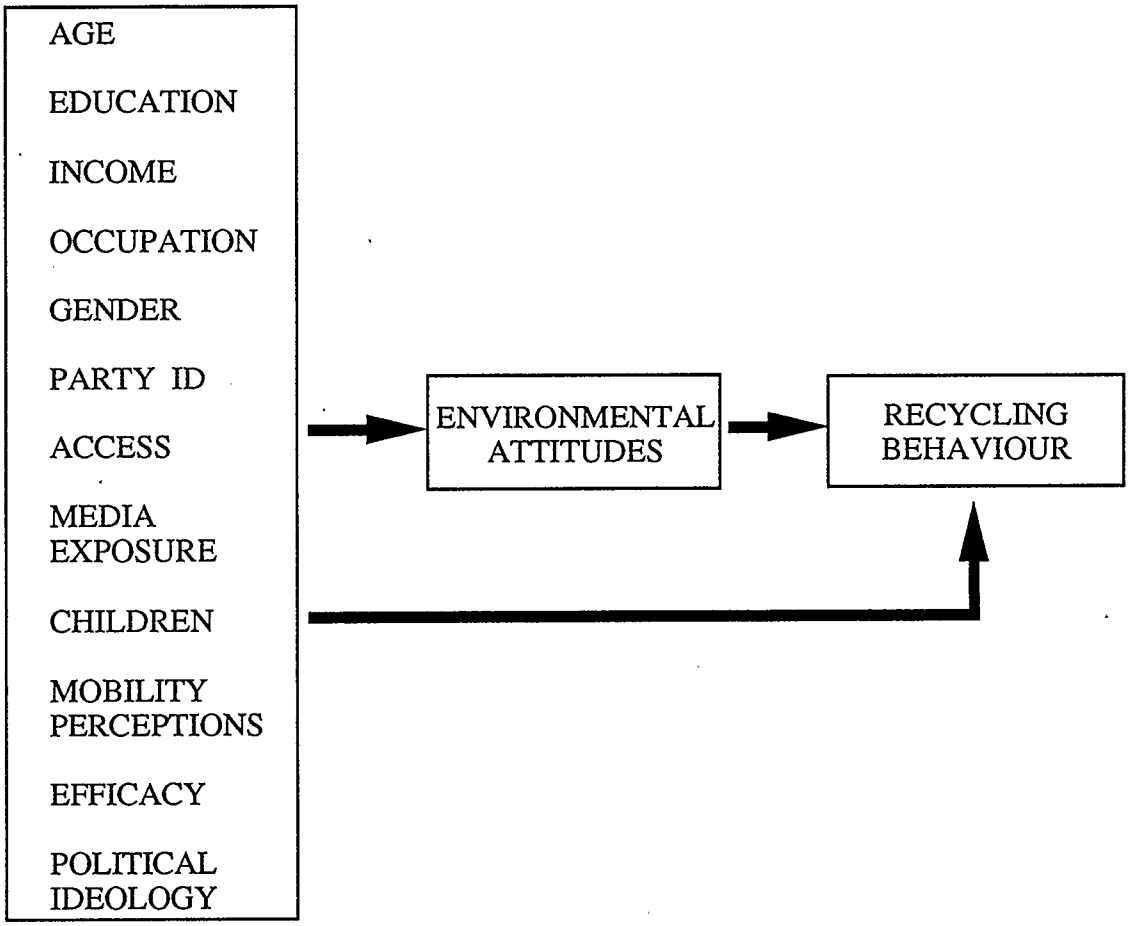
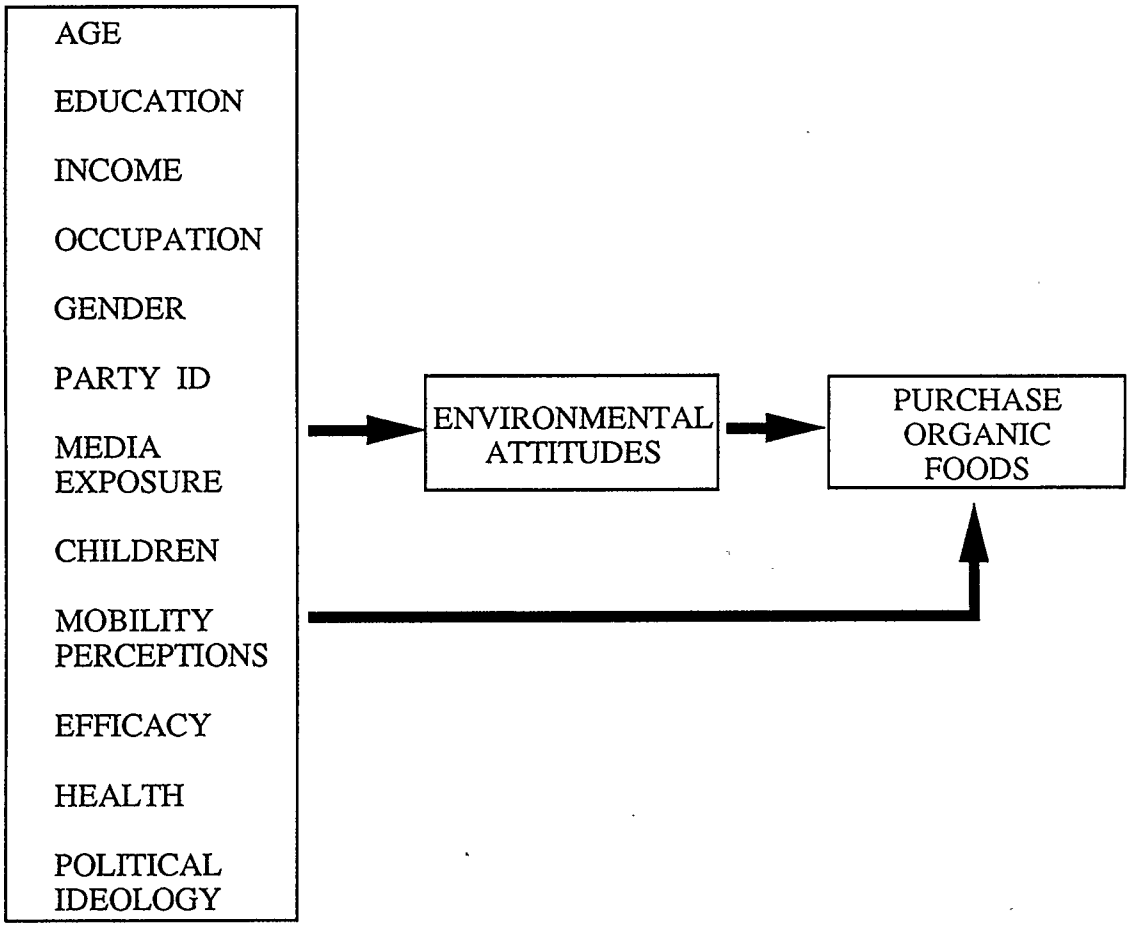


FIGURE 3

ESTIMATED MODEL FOR CONSUMER PURCHASES OF ORGANIC FOOD - MODEL 3



expect that the political structure of support for environmental protection in Canada will be somewhat different. Weak associations between party identification and environmental concern in the United States have been attributed to the relatively undifferentiated two-party system in the United States (Van Liere & Dunlap, 1980: 185). As Morrison (1986: 212) states, "in the U.S. the left is, in general, not very far left, and where it is far left is not very well organized". In Canada, however, three major political parties exist[19] with the New Democrats offering a more left wing alternative than is available to voters in the United States. Thus it is expected that effects of political party identification on environmental attitudes will be stronger in this study than has been the case in American studies, with identification with New Democrats producing greater concern.

Media exposure is included as a variable predicted to influence environmental attitudes. As previously mentioned, increased media exposure results in additional information about the nature of environmental problems, and does so in a way that encourages greater concern given journalistic preference for stories which tend toward the dramatic and sensational. The degree of exposure of individuals to media coverage of a given issue is very difficult to measure. In the literature, rather than direct measures of media exposure, one generally finds that individuals' knowledge of environmental problems is measured and attributed to degree of media exposure. Although knowledge of environmental issues was not measured in this data set, a question was available which tapped individuals' viewing preferences regarding television programs dealing with environmental issues.

There are several weaknesses associated with this measure. It does not measure the effect of media exposure comprehensively or exclusively. People derive information from a variety of media sources, television programs being only one. This variable is also a measure of people's interest in environmental issues and is no doubt affected by environmental concern in a reciprocal relationship[20]. However, given the importance

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[19]In Alberta the right wing Reform Party forms a fourth alternative.

[20]Unfortunately, statistical limitations in this study prevent the inclusion of a reciprocal relationship between media exposure and attitudes.

attributed to the effect of media coverage on attitudes in the literature, and the difficulty associated with designing a good measure of this variable, this measure of media exposure was included in the models despite the weaknesses associated with it. These limitations will be considered in the interpretation of effects.

Access to the curbside recycling program referred to in Model 2 (ACCESS) is available to residents of single family dwellings in residential neighbourhoods and allows residents to set out a number of sorted recyclable products for curbside pick up. As previously outlined, social psychological theory in the area of environmental attitudes suggests that cultural norms and values influence attitude development, and studies of recycling behaviour suggest that community norms of recycling within neighbourhoods encourages further recycling behaviour. Given this, it is hypothesized that access to a recycling program will result in increased environmental concern.

Finally, higher levels of health concerns regarding safety of foods (variable HEALTH in Model 3) is expected to result in greater environmental concern given the evidence outlined which suggests that increasing environmental concern is related to increasing concerns about individual health and safety, and to personal experience with environmental problems.

Income, occupation and gender are included as control variables in the equations predicting attitudes and are not expected to have any significant effects on level of concern. Efficacy, mobility perceptions and presence of children in the home are included for exploratory purposes and no predictions are made about their effects.

Model Considerations and Hypotheses Regarding Environmental Behaviours

Prior to delineation of hypotheses with regard to environmental behaviour, the differences between the specific behaviours, that will affect both the variables to be included in the various models and the analysis of results, will be discussed. The measure of environmental behaviour in Model 1 reflects the amount extra consumers would be willing to pay for an environmentally safe product. While all of the information on environmental behaviours in this study is based on reported rather than observed behaviour, and suffers from bias as a result, the behaviour measured in Model 1 is even further distanced from actual behaviour by virtue of the fact that it asks

respondents to report on behaviour they would undertake under certain conditions rather than actions they have performed. The analysis of findings from this model will be based on the understanding that the behaviour being measured is in fact a behavioural intention and, as such, lies somewhere between attitudes and actions, if Inglehart's use of the conception of a continuum between attitudes and behaviour is followed.

The environmental behaviour referred to in Model 3 is the purchase of organically grown foods. The costs associated with this behaviour include money, convenience and time. Price mark-ups compared with non-organic foods vary with the product from no price increase to a substantial one. Searching for organically grown products may also require extra time and energy on the part of the respondent. Although organically grown food products are becoming easier to find in grocery stores than in the past, consumers must still frequent specialty retail outlets such as health food stores to find many of the products[21].

As has already been alluded to in the attitudinal hypotheses section, an additional variable is included for analysis in each of Models 2 and 3. All of the variables included in Model 1 are also included in Models 2 and 3, and are based on findings and theorizing relevant to environmental behaviour in general. It was possible, however, to accommodate the different nature of the specific behaviours being studied with the addition of ACCESS, a variable which refers to access to a curbside recycling program, in Model 2, and HEALTH, a variable which refers to health concerns regarding the safety of food products, in Model 3.

Keeping these considerations in mind, the justification for variable inclusion in the behaviour models will be based on empirical findings regarding environmental behaviour in general, empirical research on recycling behaviour, and issues raised in the theoretical work reviewed. Previous empirical findings have suggested that income, education and gender predict a higher level of participation in environmental behaviour in general. If recycling and consumer behaviour reflect this pattern, people with higher incomes and education levels, and women more so than men, will be more likely to engage in these

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[21]Information obtained from Earth Harvest Co-op in Calgary.

specific behaviours.

Income and education, along with occupational status, are measures of economic and social advantage. Since a rational choice analysis posits that costs of participation will be relatively higher for those with fewer resources to divide among their priorities, it is expected that income, education and occupational status will be positively related to participation in environmental activities.

Empirical studies have shown that although age is often not significantly related to environmental behaviour, where it is, it is in a positive direction. Thus, while it can be expected that increasing age will be associated with recycling and consumer actions, no prediction about the strength of the relationship will be made.

Although political ideology and party identification have not been associated with environmental behaviour in American studies, their effects on environmental behaviour are included in this analysis for exploratory purposes given the differences in political structure and ideology that characterize Canada. Similarly, no prediction about the effects of media influence on behaviour are made given the lack of inclusion of media influence, as measured here, in previous research studies, and given the lack of speculation about the effects of such a variable on behaviour in the literature.

Based on the findings of empirical studies, and social-psychological theories, the prediction that attitudes will be positively but weakly correlated with behaviour can be made. A strong correlation cannot be expected given the fact that attitude reflects concern about the environment in general and behaviour refers to specific issues.

Some of the variables included reflect findings from the research that has been conducted on recycling behaviour specifically. Of the contextual factors outlined as being of importance in these studies, access to a recycling program stands out. As Oskamp et al. (1991) have pointed out, access to a curbside program addresses the issues of convenience and lack of knowledge that contribute to the costs normally associated with recycling. It also provides the setting to increase community norms of recycling behaviour. Thus it is expected that access to a curbside program will be a strong predictor of recycling behaviour, and will act to diminish the effects of other variables associated with the costs of recycling.

Another variable that has arisen in studies of recycling behaviour, and appears appropriate to include in analyses of other types of environmental behaviours as well, is the presence of children in a home. Although this variable, when tested, has not been shown to affect recycling, perhaps because of its potential contradictory effects (while it may give people more incentive to behave, it can also result in a greater strain on family resources), it may be expected to be positively related to behaviour when more immediate concerns about personal well-being are present as in Model 3.

Personal efficacy, a factor that has been suggested in social psychology, and tested in recycling studies, has been shown to be positively related to environmental behaviour. Closely related to the sense of ability to make a difference is the interest and energy necessary to do so. If little hope of making a difference exists, it follows that interest in participation will be low. Both apathy and powerlessness have been connected to social class and to lack of participation in environmental behaviours. The socially and economically advantaged have greater access to resources, and more experience with success, which lead to both a greater sense of power and more interest in devoting energy to the issue.

Based on the argument that efficacy and apathy are related and equally important psychological determinants of behaviour, the measure of efficacy that is included in all three models is actually a broader concept that incorporates both of the lack of interest in things and lack of hope about the future in general. It is expected that this measure of efficacy and interest will be positively related to class variables of income, education and occupational status and to environmental behaviours. The relation between efficacy and behaviour is not expected to be large, however, given that the measure of efficacy and interest relates to generalized rather than situation-specific perceptions (Huebner & Lipsey, 1981). The specific question wording of these indicators can be found in the data and methods section.

Perceptions of mobility are included given their relation to class identity. As mentioned previously, this is based loosely on Wright and Shin's (1988) suggestion that both class identity and objective realities of structure be incorporated in a measure of class. The notion that mobility perceptions will affect behaviour is also related to the

concept of relative deprivation found in social psychology literature. If people feel deprived relative to their expectations, this may affect their behaviour in much the same way that absolute deprivation would be expected to. The two indicators used to measure mobility perceptions refer to conceptions of affluence compared to past conditions and to that expected in the future. Like education, income and occupational status, perceptions of greater mobility are expected to be positively related to environmental behaviours.

Several researchers, including those who use a rational choice analysis, have suggested that motivation for participation will increase with fear of perceived personal health hazards, given the increased personal risk associated with not participating. A measure of the perceived health hazards associated with food additives was available and deemed appropriate to include as a variable in Model 3. The exact wording for this question is listed in the section below. A tighter causal connection between this measure of health concerns and the purchase of organic foods could have been made if the question had referred specifically to the chemicals or preservatives used in the production of grains, vegetables and fruits. However, this variable does measure a health concern about the effect of chemical additives and preservatives on the safety of food in general, and is expected to result in not only increased environmental concern but also in increased purchase of organically grown food.

Thus, the predictor variables included in each model reflect the empirical findings and theories outlined in the literature review. The prominent hypotheses being tested are as follows:

- Following a cost-benefit analysis, environmental behaviour will increase when programs are accessible which lower the cost of participation, such as a curbside recycling program, and when personal health risks are associated with non-participation.
- Because the personal costs of participation vary across social groups, variables related to economic and social advantage such as income, education, occupational status, mobility perceptions and efficacy are also expected to affect the level of participation in environmental activities with increased advantage associated with greater participation.
- General environmental attitudes will have a weak positive effect on the behaviours

studied such that higher degrees of concern will result in increased environmental activity. Attitudes, in turn, are related to structural, contextual and perceptual variables such as age, education, political beliefs and affiliations, media exposure, and health concerns.

The structural design of the models reflects theoretical considerations and allows for the measurement of indirect effects on environmental behaviour. The placement of environmental attitudes in the centre of the model follows Liska's (1984) conceptualization of social conditions and social norms as background variables in studies of attitudes and behaviour. It acknowledges the effect of attitudes on behaviour and the effect of social structure, situational factors, and other psychological processes on both attitudes and behaviour[22] It follows that to the degree that the pre-determined variables affect attitudes, their total effect on behaviour will include an indirect effect as mediated by attitudes.

Data and Methods

Data for this study were obtained from the 1990 Edmonton Area Study, an annual survey conducted by the Population Research Laboratory at the University of Alberta. Personal interviews were conducted with a total of 448 residents of Edmonton in this random sample survey. One adult resident per household was interviewed. A quota system was used to obtain an equal number of male and female respondents, and the overall response rate was 75 percent (Kinzel & Odynak, 1990).

Measures

All of the pre-determined variables in each model were measured using single indicators with the exception of mobility perceptions, efficacy, and political ideology. Age was measured in actual years. Level of education completed was measured on a 15 point scale ranging from no schooling to a university doctorate degree and included technical training. Family income was determined by thousands of dollars of gross income. Occupational status was measured using Blishen, Carroll and Moore's (1987)

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[22]As was mentioned previously, the possibility that reciprocal effects exist between environmental attitudes and the pre-determined variables is acknowledged, but unable to be accommodated by the statistical procedures used in this study.

socio-economic index. Gender was a dummy variable coded 1 if the respondent was male. Presence of children in the home was also a dummy variable coded 1 if children under 18 years resided in the home (n = 179).

Political party identification was determined from responses to the question: "if an election were held today, how would you vote provincially?" This variable was dummy coded. Those who identified with the party furthest to the left of the political spectrum in Canada, the New Democratic Party (n = 115), were coded as 1 and those who identified with other political parties or with no political party were coded as 0.

Media exposure was measured with a question which asked respondents to list the three types of television programs they preferred most to watch. Programs on environmental issues represented one choice out of eleven. Other choices included drama, issues facing families, health issues, natural science and wildlife, and "how to" programs. The variable created was a dummy variable coded 1 if respondents indicated programs on environmental issues as one of the three types of programs they preferred to watch (n = 129), and 0 otherwise.

Access to a recycling program, as used in Model 2, was available to residents of single family dwellings or side by side duplexes in Edmonton in 1990 (Derksen & Gartrell, 1991: 17). Other residents could recycle the same products as those collected in the curbside program, but would have to transport these goods to a recycling depot[23]. Thus, residents who lived in single family dwellings or duplexes were coded 1 (n = 267) and all others were coded 0.

Health concerns regarding the safety of food products in Model 3 is represented by responses to the statement: "Our food is becoming unsafe because of food additives". Responses range from 1 (strongly disagree) to 7 (strongly agree). Thus high scores on this item represent high levels of health concern.

Multiple indicators were available to measure mobility perceptions and efficacy. Responses from the questions: "Would you say that you (and your family) are better off or worse off or just the same financially than you were a year ago?" (Mobility 1) and

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[23]Information obtained from the Edmonton Recycling Society.

"Do you think that a year from now you (and your family) will be better off financially, or worse off financially, or just about the same as now" (Mobility 2), were used to measure mobility perceptions. These items are coded on a scale of 1 to 3, with 3 representing perceptions of increased mobility. The items used to measure efficacy are: "In the past year how much were you distressed by feeling no interest in things?" (Efficacy 1) and "In the past year how much were you distressed by feeling hopeless about the future?" (Efficacy 2). These items were coded on a scale of 1 through 5, with 5 representing high feelings of efficacy. The standardized factor loadings for the items used to measure mobility perceptions and efficacy are listed in Table 1.

No scale of self-identified political ideology was available in the questionnaire. Thus, political ideology was measured instead with the multiple indicators listed in Appendix I. These items represent a limited measure of political ideology. Specifically, they tap respondents' attitudes toward government spending on social programs and, to some extent, respondents' feelings regarding the nature of the family and family values. As such, they do measure parts of the economic and social dimensions that have been identified as components of political ideology (Conover & Feldman, 1981: 618; Fleishman, 1988), but do not do so in a comprehensive way, and this must be taken into consideration in the analysis of results. The standardized factor loadings for these items, for each model, can be found in Table 1.

Multiple indicators were not available to provide measures for the two endogenous variables in each Model. The concept of environmental attitudes, included in each model, is reflected by responses to the single item: "How concerned are you about the state of the earth's environment?" Responses range from 1 (not at all concerned) to 7 (very concerned).

The first measure of behaviour, consumer behavioural intentions, is represented by responses to the statement and question: "Think about a product in a grocery store or a hardware store that usually costs you $10.00. If an environmentally safe alternative to that product was available, how much more money would you be willing to pay for it? Responses to this question originally ranged from $0 to more than $ 5.00 on a 9 point scale. Given that this scale contained unequal intervals and that most of the responses

Table 1 - Standardized Estimates For Measurement Components

	Factor Loadings[1]		
Latent Constructs[2]	Model 1	Model 2	Model 3
Political Ideology			
Item 1	(.696)	(.686)	(.683)
Item 2	.892*	.879*	.867*
Item 3	.481*	.476*	.475*
Item 4	.477*	.471*	.463*
Item 5	.438*	.397*	.403*
Mobility Perceptions			
Item 1	(.754)	(.697)	(.581)
Item 2	.412*	.447*	.522*
Efficacy			
Item 1	(.649)	(.634)	(.660)
Item 2	.643*	.652*	.628*

[1] Coefficients are lambdas calculated using maximum likelihood estimates.

[2] Item definitions for political ideology are listed in Appendix I. Definitions for mobility perceptions and efficacy items are contained in the text.

Note: Factor loadings in parentheses were fixed at 1 prior to standardization to establish a metric for the loadings.

* Estimates are significant beyond the .05 level.

fell under $3.00, it was recoded to a 4 point scale that ranged from $0 to $3.00. Those who indicated more than $3.00 were included in the $3.00 category.

Recycling behaviour in Model 2 is a continuous variable measured by calculating the number of different types of items currently recycled in a household. The possible types of items respondents were able to choose from are: beverage cans and bottles, newspapers, household plastics, milk cartons, food cans, other paper products, compost material, motor oil, glass, clothing/toys/furniture, and other. The first six items on this list are collected in the curbside recycling program (Derksen & Gartrell, 1991: 14).

The purchase of organically grown foods, the environmental behaviour referred to in Model 3, is represented by responses to the query; "please tell me how often you .... try to purchase organically grown foods". Responses range from 1 (never) to 7 (always).

Data Analysis

Given that multiple indicators were available for the constructs of political ideology, mobility perceptions and efficacy, latent construct structural equation estimation using LISREL[24] version 6.6 was chosen to analyze the data. Using maximum likelihood estimation procedures, this program allows for the simultaneous estimation of the structural and measurement models (Jöreskog & Sörbom, 1989: 1-3). When multiple indicators are available for latent constructs, the use of LISREL allows measurement error to be considered in the estimation of structural equations rather than assuming unrealistically that the variables are measured without error as is the case in regression analysis (Pedhazur, 1982: 636-41). LISREL also provides a number of goodness-of-fit indicators and information regarding specific areas of weakness in the model that is not available using ordinary least squares regression.

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[24]LISREL, or linear structural relations, has become known as both the name of a statistical software package and a statistical model and approach to data analysis (Long, 1983: 7).

Subsequent Exploratory Analysis: Attitude-Behaviour Consistency

Thus far the models described are appropriate for an examination of the determinants of environmental attitudes and for an examination of the determinants of environmental behaviour, one of which is hypothesized to be environmental attitudes. The strength of the environmental attitude-behaviour relationship and the indirect effects of attitudinal determinants on behaviour are considered in Models 1 through 3, along with the effects of the other structural, situational and perceptual variables on behaviour. Thus the analysis up to this point allows for identification of the barriers and motivations associated with the degree of environmental behaviour and, assuming that people would act on attitudes if costs were not too high, it allows one to speculate that attitude-behaviour consistency could also be increased if barriers were removed. A more direct examination of the nature of the attitude-behaviour relationship could supplement this analysis, however, especially given that in the case of environmental issues, attitudes indicating concern are generally common, while corresponding behaviour is not.

Support can be found in the social psychological and social movement literature reviewed for an exploratory analysis of attitude-behaviour consistency using the same structural equations as those used to predict attitudes and behaviour. Liska (1984: 63) postulates that resources may be the best predictors of behaviour when there is little variation in intentions relative to variation in resources. Resource mobilization theory also suggests that opportunities and resources are required in addition to psychological motivation for activism to occur. The effect of situational and normative factors on attitude-behaviour consistency has also been widely explored in social psychological literature. Thus, there is reason to believe that there may indeed be direct causal relations between the variables identified and the degree of consistency between attitudes and behaviour.

The exploration of attitude-behaviour consistency, for each type of behaviour examined, was undertaken by creating a measure of consistency between attitudes and behaviours and treating it as a dependent variable in a causal analysis that included the previously identified pre-determined variables in Models 1 through 3. The measure of consistency between attitudes and each of the three behaviours was created by coding all

of the variables on a 7 point scale and then subtracting concern from behaviour. Consumer intentions and recycling behaviour, previously not coded on 7 point scales, were recoded. Consumer intentions to pay more were coded from $0 to more than $5.00 on a 7 point scale and recycling behaviour was coded from 0 to 6 items or more recycled per household. Attitudes and purchasing of organic foods were left in their original 7 point form. The scale which resulted from subtracting concern from behaviour ranged from 1 (very inconsistent) to 7 (very consistent).

Given that the focus of this exploration was on those factors that would increase the relationship between expressed environmental concern and behaviour, only those situations where measures of concern equalled or exceeded measures of behaviour were used in the analysis, and these included the majority of the cases. Restricting the analysis to these cases will provide information on the factors that affect the degree to which people act on the concerns they hold. The remaining cases are examples of situations where behaviour occurred in the absence of strong concern and are supportive of the contention that factors other than attitudes affect behaviour independently.

The inclusion of an analysis of environmental attitude-behaviour consistency in this research allows the study to move beyond an identification of the variables which affect attitudes and/or behaviour, to an examination of the influence of these variables on the degree of congruity between attitudes and behaviour, when appropriate attitudes exist but are not met with equal levels of behaviour. Essentially, this is one way of exploring for interaction between environmental attitudes and the other predictor variables in a study of behaviour, for those cases where concern meets or exceeds levels of behaviour. It entails examining whether environmental concern affects behaviour differently for different values of the predictor variables.

Confirmatory Analysis For Recycling Behaviour

The 1991 Edmonton area study repeated questions regarding general environmental concern and recycling behaviour. Data from this random sample telephone survey of 491[25] Edmonton residents was used to confirm results of the analysis of recycling behaviour by re-testing a reduced model suggested by the 1990 findings[26] (Kinzel & Odynak, 1991). The variables included in this analysis were age, education, political party affiliation, media exposure, mobility perceptions, political ideology, access to a recycling program, and general environmental attitudes. Although comparable data was available to test the determinants of recycling behaviour in this survey, the questions used to measure media exposure and access to a recycling program were worded in slightly different ways. As well, it was necessary to use single item indicators to measure political ideology and mobility perceptions rather than scales.

Media exposure to environmental issues was measured in the 1991 survey as a continuous variable and reflected responses to a question that asked respondents how likely they were to watch documentaries on environmental issues. Responses ranged from 1 (highly unlikely) to 7 (highly likely). A measure of access to a recycling program was ascertained from the 1991 survey by asking respondent's directly if their household participated in a 'Blue Box' program. This variable was dummy-coded with 1 representing participation in the program.

No comparable, reliable scale of political ideology was found in the 1991 data, but a single item was available that appeared conceptually close to the concept captured by the 1990 scale of political ideology. This item was "It is all right for a married woman with pre-school children to work outside the home". Responses ranged from 1 (strongly disagree) to 7 (strongly agree). The same two items used to measure mobility perceptions in the 1990 survey also appeared in the 1991 survey. These items, however, displayed considerably different, and statistically insignificant, factor loadings when

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[25]Response rate was 71%.

[26]Comparable data was not available to re-test the original model in its entirety.

incorporated into a measurement model using LISREL. It thus appeared that in the 1991 sample, these items did not form a reliable scale and as a result the decision was made to use only the first item[27]; "would you say that you and your family are better off or worse off or just the same financially than you were a year ago?", as a measure of mobility perceptions. This was again coded on a 3 point scale with 3 representing increased mobility perceptions.

The results of this confirmatory analysis, to the degree that they correspond with the original study, lend support to the analysis of the results of this thesis and the implications discussed.

[27]This suggests that either the structure of mobility perceptions changed in the population during the time between surveys or that coding or sampling error occurred in one of the two surveys.

CHAPTER 4

RESULTS

Aspects of the study outlined and discussed in this chapter include descriptive findings, structural equation results with regard to attitudes and specific behaviours, a comparison of specific behaviours, the outcome of the exploration of attitude-behaviour consistency, and the confirmatory findings with regard to 1991 recycling behaviour. Most of the information will be presented in tabular form with the main findings highlighted in the text. Interpretations of individual results based on previous empirical findings and theoretical insights, as well as comment on the degree of support found for various hypotheses, will be incorporated into the discussion of findings.

Descriptive Results

The means and standard deviations for the variables included in Models 1 through 3 are listed in Appendix II, and the correlations among the explanatory variables are listed in Appendix III. As expected, general environmental concern in these models was very high. On a scale of one to seven the mean for this variable was 5.9 with 47 percent of the sample stating that they were very concerned. In almost all cases concern was higher than levels of behaviour when all were coded on seven point scales in order to construct a measure of consistency. Out of 448 cases, only 19 in Model 1, 74 in Model 2, and 23 in Model 3 represented cases where behaviour, on a seven point scale, exceeded levels of concern on a seven point scale.

The mean amount extra that people were willing to pay for an environmentally safe alternative to a $10.00 product was $1.70 on a four point scale ranging from 0 to $3.00[28]. Bearing in mind that over half of the sample had access to a curbside recycling program where six types of items were collected, the average number of items

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[28]As was mentioned previously, this variable was recoded because it was characterized by unequal intervals and a skewed distribution in its original form. If an average is taken from responses as they existed in their original form (which ranged from 0 to more than $5.00), people stated that they were willing to pay, on average, $2.03 extra for a $10.00 item.

recycled per household was 3.3. Finally on a seven point scale which measured attempts to purchase organic foods that ranged from never to always, the mean was 3.2.

Noteworthy among the correlations found in Appendix III are the relationships among the perceptual (mobility and efficacy) and structural (income, education and occupation) variables associated with socioeconomic advantage. As expected mobility perceptions and efficacy are positively related to each other and to income, education, and occupation, although efficacy, as it is measured in this study, is more strongly related to income and occupation than it is to education. In Model 1 the correlations of mobility perceptions with income, education and occupation are .318, .215 and .235 respectively. For efficacy these associations are .284, .169 and .261 respectively. Also of some interest is the fact that access to a curbside program is positively correlated with income ($r = .398$) and age ($r = .243$). This is not surprising given that most home owners could be expected to be included in this group.

Structural Equation Results

Model 1 - Consumer Behavioural Intentions

The structural equation results for the first model are listed in Table 2. Level of education, political party identification and media exposure are the only three variables that had statistically significant effects on environmental attitudes. Higher levels of education in this sample result in greater environmental concern, and, in comparison with those who choose not to watch television programs dealing with environmental issues, those who prefer such programs exhibit greater environmental concern. Finally, compared with non-New Democrats, identification with the New Democratic Party resulted in greater concern about the earth's environment. The significant effect of political party identification on environmental attitudes in this study may be reflective of stronger ideological divisions among political parties in Canada, than is the case in the United States, as suggested above.

Political ideology also had a positive effect on environmental attitudes such that more liberal political views resulted in higher levels of concern, but this effect did not reach statistical significance at the .05 level. This may, in part, be indicative of the limited measure of political ideology used in this study. Although the factor loadings in

Table 2 - Structural Equation Results For Model 1: Consumer Intentions

	Environmental Attitudes		*Consumer Intentions*	
Explanatory Variables	***U***	***S***	***U***	***S***
Age	.010	.106	-.007	-.105
Education	.084*	.154*	.030	.074
Income	.002	.035	.001	.020
Occupation	-.001	-.011	-.002	-.020
Gender	.121	.045	.001	.000
Party ID	.428*	.144*	.099	.045
Media Exposure	.563*	.192*	.259*	.119*
Children	-.044	-.016	-.075	-.037
Mobility	-.015	-.006	.177	.097
Efficacy	.078	.039	.018	.012
Political Ideology	.138	.107	.038	.040
Attitudes			.086*	.115*
R-Squared	.102*		.078*	

Goodness of Fit = .963
Adjusted Goodness of Fit = .916 N = 344
Chi-Square/DF = 1.50

Structural equation coefficients are unstandardized (U) and standardized (S) gamma and beta coefficients calculated using maximum likelihood estimates. These should be interpreted like regression coefficients produced using ordinary least squares estimation.

* Estimates are significant beyond the .05 level.

the measurement model indicate that the measure of political ideology used is reliable, the extent of its validity may be questionable.

The fact that the effect of age on attitudes was not statistically significant, nor in the direction expected, in any of the three models, lends support to the hypothesis that age is having less impact on environmental attitudes as awareness of environmental issues is dispersed throughout the population.

Of the variables expected to affect consumer behavioural intentions, only media exposure and attitudes were statistically significant. Those who preferred to watch programs on environmental issues were willing to pay 26 cents more on average (when responses were allowed to range from 0 to $3.00) for environmentally safe products than those who did not. Higher levels of environmental concern also resulted in higher estimates of the amount extra people were willing to pay. An increase in one level of concern on the seven point scale resulted in a willingness to pay nine cents more, on average, for a product.

Age, in this equation, had a negative, but insignificant effect, on consumer intentions. The direction of the effect implies that younger age will result in intentions to pay higher amounts for environmentally safe products. The fact that the direction of effect is opposite to that associated with environmental concern is of some interest, but lack of statistical significance limits any conclusions that can be drawn from this.

Of the variables that reflect individual socio-economic experiences both education and mobility perceptions have positive effects on behavioural intentions such that those with higher education and those who feel their economic situation is improving are willing to pay more for environmental protection, but these effects did not reach statistically significant levels. The effects of income and occupation were negligible.

The goodness-of-fit indicators and chi-square to degrees of freedom ratio suggests a reasonable, but not exceptional, fit of the model to the data. Goodness-of-fit indicators are measures of the overall fit of the model to the data. They range between zero and one and indicate the relative amount of variance and covariance explained by a model (Price & Hsu, 1992: 38). The adjusted goodness-of-fit index is adjusted for degrees of freedom. Large chi-squares in the context of a LISREL model indicate a poor fit of the

model to the data and degrees of freedom serve as a standard by which to judge the size of chi-square (Jöreskog & Sörbom, 1989: 43). There are differences among researchers as to what constitutes an acceptable chi-square to degree-of-freedom ratio. The "acceptable" ratios range from two or three up to five (Hayduk, 1987: 168).

Thus, with a goodness-of-fit indexes and adjusted-goodness-of fit indexes over .9 and chi-square to degree-of-freedom ratios under two, all three behavioural models fall within acceptable fit limits. The error that does exist in the estimation of the models is due in part to the inclusion of several variables, many of which have weak effects (Pedhazur, 1982: 148, 228-29).

Ten percent of the variance in environmental attitudes is explained by the explanatory variables in Model 1, a figure which is in line with that found in other studies. However, only eight percent of the variance in consumer intentions is accounted for by the variables in the model, a finding which may be related to the nature of behavioural intentions and the difference between intentions and reports of actual behaviour. Intentions are not necessarily followed up on and may, in measurement, incorporate speculation and spur of the moment responses. These are characteristics which Inglehart (1990: 383-84) associates with "soft" indicators such as attitudes, and which make explanations of variance based on patterns more difficult to accomplish. The comparison of the predictors of consumer intensions with those of the other environmental behaviours, to follow, will add to an analysis of the contrast between environmental behavioural intentions and environmental behaviours.

Before leaving the discussion of findings in Model 1, some of the indirect effects of the exogenous variables on consumer intentions, found in Table 3, deserve mention. In structural equation models it is possible to consider, not only the direct, but also the indirect effects of explanatory variables, and thus attain an assessment of the total effect of explanatory variables on the dependent variable(s) as a result of more precise model specification. Indirect effects are those parts of an explanatory variable's total effect that are transmitted or mediated by an intervening variable(s), which in this case, is environmental attitudes (Alwin & Hauser, 1975: 30) The values for indirect effects reported in Table 3 are calculated by subtracting the direct effects in the structural

Table 3 - Total and Indirect Effects On Environmental Behaviours[a]

Explanatory Variables	*Consumer Intentions*		*Recycling Behaviour*		*Purchase Organic Foods*	
	Total	Indirect	Total	Indirect	Total	Indirect
Age	-.093	.012	.084	.010	.046	.015
Education	.091	.017	.121	.021	.068	.041
Income	.024	.004	.029	.005	-.058	.009
Occupation	-.021	-.001	.064	-.001	.004	.004
Gender	.006 (.011)	.006 (.010)	-.054 (-.284)	.004 (.016)	.027 (.104)	.008 (.029)
Party ID	.061 (.136)	.016 (.037)	.003 (.016)	.015 (.078)	-.077 (-.336)	.023 (.102)
Access			.516 (2.413)	.006 (.029)		
Media Exposure	.141 (.308)	.022 (.049)	.054 (.275)	.026 (.134)	.115 (.492)	.035 (.152)
Children	-.039 (-.078)	-.002 (-.003)	.038 (.178)	-.001 (-.007)	.105 (.415)	-.008 (-.029)
Mobility	.096	-.001	-.101	.002	-.140	.013
Efficacy	.016	.004	.074	-.001	.036	.006
Health					.270	.065
Political Ideology	.052	.012	-.018	.013	.004	.020
Attitudes	.115		.130		.208	

[a] Coefficients are standardized. Coefficients are in parentheses are unstandardized coefficients for the dummy variables.

equations from the total effects.

Education, party identification and media exposure, all of which had significant positive effects on attitudes, also had noticeable indirect effects on consumer intentions. The total standardized effect of education on consumer intentions was .091 of which .017, or 19 percent, was mediated by attitudes. In other words, 19 percent of the total effect of education on consumer intentions is due to the effect that education has on attitudes which then, in turn, positively affect consumer intentions. Similarly when total effects were considered, the already significant positive effect of media exposure on consumer intentions increased by .049, such that 16 percent of the total effects of media exposure on consumer intentions were transmitted via attitudes. The total effects of other variables on consumer intentions were similarly influenced by the effect these variables first had on attitudes.

Model 2 - Recycling Behaviour

The results of the structural equation models for Model 2 are reported in Table 4. The conclusions applied to attitudes in the previous section apply here as well, however an additional variable, ACCESS, was expected to affect attitudes in this equation, but that expectation was not supported. Only two variables predicted recycling behaviour in this model, those being access to a recycling program and environmental concern. Of these, access to a recycling program was by far the strongest predictor. Every one point increase in concern on the seven point environmental attitude scale resulted in the recycling of .216 more items per household. This means that the difference, in the number of items recycled, between someone who is not at all concerned about the environment (controlling for access to a recycling program and all of the other explanatory variables in the model) and someone who is very concerned (in other words between 1 and 7 on the attitude scale) is 1.3 items. Access to a curbside, regardless of level of concern, resulted in, on average, the recycling of 2.4 more types of items per household compared to those who did not have access to such a program.

The effect of education on recycling fell slightly short of reaching significance at the .05 level but was significant at the .1 level. Oddly enough, although education, income, occupational status and efficacy all have positive (although insignificant) effects

Table 4 - Structural Equation Results For Model 2: Recycling Behaviour

	Environmental Attitudes		*Recycling Behaviour*	
Explanatory Variables	***U***	***S***	***U***	***S***
Age	.007	.077	.012	.074
Education	.090*	.161*	.092	.100
Income	.002	.037	.003	.024
Occupation	.001	.011	.012	.063
Gender	.096	.035	-.268	-.058
Party ID	.361*	.116*	-.062	-.012
Access	.133	.047	2.384*	.510*
Media Exposure	.620*	.202*	.141	.028
Children	-.030	-.011	.185	.039
Mobility	.037	.013	-.475	-.103
Efficacy	-.011	-.005	.263	.075
Political Ideology	.135	.102	-.068	-.031
Attitudes			.216*	.130*
R-Squared	.100*		.407*	
Goodness of Fit = .961				
Adjusted Goodness of Fit = .909	N = 360			
Chi-Square/DF = 1.61				

Structural equation coefficients are unstandardized (U) and standardized (S) gamma and beta coefficients calculated using maximum likelihood estimates. These should be interpreted like regression coefficients produced using ordinary least squares estimation.

* Estimates are significant beyond the .05 level.

on recycling behaviour, mobility perceptions have a negative effect such that perceptions of worsening economic situations are linked with increased recycling. Given that the coefficient is not statistically significant, this result could be put down to sampling fluctuations. An alternative speculation to consider is one suggested by De Young (1986: 442-43). De Young described the satisfaction from frugality, that is "the careful use of resources and avoidance of waste", as one of the intrinsic satisfactions people gain from recycling and this could be associated with people's perceptions of worsening economic situations.

Although media exposure had a strong effect on environmental attitudes it did not have a significant direct effect on recycling behaviour. Thus, although a preference for programs examining environmental issues increases general environmental concern, it does not increase recycling behaviour. A similar conclusion can be drawn with regard to political party preference. Compared with those who do not identify themselves with the New Democratic Party, those who do, display increased environmental concern but are not any more likely than others to increase recycling behaviour[29]. The strong effect that both media exposure and party identification have on attitudes is reflected, however, in the indirect effects of these variables on recycling behaviour as discussed below.

A large portion of variance (41 percent) is explained in the equation for recycling behaviour and the majority of this can be attributed to the presence of a curbside program[30]. The convenience afforded by this program alleviates the costs of time, money and energy associated with recycling in the absence of a curbside program. The fact that over half of those sampled had access to the program may have contributed to the lack of statistical significance of those variables associated with economic advantage.

Among the indirect effects of the explanatory variables on recycling (Table 3), the

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[29]The effect of political ideology, although not significant, displayed the same directional pattern when moving from attitudes to behaviour.

[30]When recycling behaviour is regressed on access to a recycling program in a bivariate equation, 34 percent of the variance in recycling behaviour is accounted for. If recycling behaviour is regressed on general environmental concern in a bivariate equation, only four percent of the variance in recycling behaviour is accounted for.

effect of education stands out, especially given the fact that the direct effect of education was just shy of reaching significance at the .05 level. When the total effect of education on recycling behaviour is considered, the standardized effect coefficient increases from .100 to .121. An examination of the rank ordering of total effects compared to direct effects reveals that education increased in relative importance from fourth to third, and ranked just under attitudes in relative importance when total effects were considered. Seventeen percent of this total effect of education on recycling is mediated by attitudes.

As alluded to above, a large portion of the total effect of media exposure on recycling behaviour occurs indirectly through attitudes. Media exposure did not have a large total effect on recycling behaviour, but 48 percent of the effect that was recorded was transmitted through attitudes. A positive indirect effect of party identification was also transmitted through attitudes, but this was not enough to increase the slope associated with party identification by any substantial amount.

Model 3 - Consumer Purchasing Behaviour

The structural equation results for Model 3 listed in Table 5 show that political party identification, presence of children in the home and environmental concern all significantly affect the purchase of organic foods, while health concerns affect both environmental attitudes and purchasing behaviour. Seventeen percent of the variance in attitudes, and 18 percent of the variance in consumer purchasing behaviour is explained by the variables in the structural equations.

Health concerns ranked as the strongest predictor of both attitudes and behaviour in this model. Each one point increase on the seven point scale measuring concern about the safety of foods resulted in a .21 increase on the seven point scale measuring general environmental concern and a .24 increase on the seven point scale measuring purchasing behaviour. This finding lends support to those researchers who claim that increasing concerns with health and safety are becoming a prominent factor in shaping people's attitudes toward the environment. It also supports the self interest notion that behavioural motivation increases with perceptions of personal risk.

General environmental concern was the second strongest significant predictor of how often the attempt is made to purchase organically grown foods, followed by presence

Table 5 - Structural Equation Results For Model 3: Purchase Organic Foods

	Environmental Attitudes		*Purchase Organic Foods*	
Explanatory Variables	***U***	***S***	***U***	***S***
Age	.007	.072	.004	.031
Education	.112*	.197*	.022	.027
Income	.003	.043	-.006	-.067
Occupation	.002	.019	.000	.000
Gender	.102	.037	.075	.019
Party ID	.350*	.111*	-.438*	-.100*
Media Exposure	.525*	.171*	.340	.080
Children	-.101	-.035	.444*	.113*
Mobility	.210	.063	-.711	-.153
Efficacy	.056	.028	.085	.030
Health	.215*	.264*	.242*	.215*
Political Ideology	.129	.096	-.030	-.016
Attitudes			.290*	.208*
R-Squared	.169*		.180*	
Goodness of Fit = .958				
Adjusted Goodness of Fit = .901	N = 354			
Chi-Square/DF = 1.71				

Structural equation coefficients are unstandardized (U) and standardized (S) gamma and beta coefficients calculated using maximum likelihood estimates. These should be interpreted like regression coefficients produced using ordinary least squares estimation.

* Estimates are significant beyond the .05 level.

of children in the house and party identification. Those respondents with greater general environmental concern, and those with children under 18 years of age in the home compared to those with no children in the home, indicated increased attempts to purchase organic foods. These effects are in the directions hypothesized. The effect of party identification, however, is not.

Those respondents who identify with the New Democratic Party, although expressing greater degrees of concern about the environment in general, are less likely than people who do not identify with the New Democrat Party, to attempt to purchase organic foods. One possible explanation for this is offered by Inglehart (1990: 384). He suggested that although the traditional Left, i.e., those involved in party politics, are generally favourably inclined toward change oriented movements they see as progressive, they will hesitate to follow through on this by becoming involved in new social movements given the lack of a clear link between this behaviour and their top priorities of economic and physical security. Although Inglehart's explanation is drawn in an attempt to distinguish between the "new" and "traditional" Left in the context of support for new social movements, in the context of this study it suggests that the purchase of organic foods is not seen, by those identifying with the New Democratic Party, as a beneficial use of time and resources given their priorities. As noted below, the negative effect of party identification on purchasing behaviour is substantially diminished when the indirect effects of party identification as mediated by attitudes is considered.

The negative effect of party identification on the purchase of organic foods was an unexpected result and the explanation offered is merely speculative. Given the lack of corroboration with regard to other environmental behaviours in the literature, further study is required before reliable conclusions regarding the direction and nature of political party identification and the purchase of organic foods can be drawn.

The negative effect of mobility on the purchase of organic foods, although relatively large, is not significant at the .05 or .1 levels. One possible explanation for this is that mobility is intercorrelated to a considerable degree with several other variables in the equation (correlations with age, education, income, occupation, efficacy and health range between the absolute values of .2 and .3) resulting in a larger standard error

associated with its slope than would have been the case in the absence of these intercorrelations (Pedhazur, 1982: 59). Since perceptions of mobility are conceptually separate from absolute levels of income and from the other variables with which it shares association, multicollinearity is not suspected as the cause of the intercorrelations.

Of the indirect effects on the purchase of organic foods (Table 3), education again had a substantial effect. Given the low direct effect of education on the purchase of organic foods, 60 percent of the total effect of education on the purchase of organic foods was mediated by attitudes. The total standardized effect of health on consumer purchases jumped from .215 to .270, with 24 percent of this transmitted via attitudes. Media exposure also had noticeable indirect effects in this equation. The unstandardized slope for media exposure increased from .340 to .492 when total effects were considered.

The positive effect of party identification on attitudes tempers the total negative effect of party identification on consumer purchasing. The unstandardized effect of New Democrat identification on the purchase of organic food when total effects are considered is -.336, as opposed to -.438 when only direct effects are considered.

Model Comparisons

The results from the above analysis of three types of environmental behaviours lends support to the contention that environmental behaviours are not necessarily strongly linked and need to be considered separately. Although all of the behaviours in this study were weakly connected to general environmental concern, this was the only predictor they shared. Media exposure had a direct effect on consumer behavioural intentions but did not directly affect recycling behaviour or the purchase of organic foods. The fact that media exposure (a predictor of attitudes in this study) was the only variable other than attitudes to directly affect consumer behavioural intentions lends support to the suggestion that reports of behavioural intentions are further distanced from actual behaviour than reports of behaviour undertaken, and may in fact be closer to attitudes than actual behaviour on a continuum.

Given the reservations associated with the use of behavioural intentions as a valid measure of behaviour, conclusions regarding environmental behaviours will be taken, for the most part, from the results of Models 2 and 3. Although these models had different

predictive structures, due to the nature of the problem being addressed in each case and the presence or absence of mechanisms to facilitate the behaviour, some similarities emerge especially with regard to hypotheses which were not supported.

With the possible exception of education in Model 2, the variables associated with socioeconomic advantage did not have statistically significant effects on recycling behaviour or purchases of organic foods, and in both cases mobility perceptions had effects in the direction opposite to that predicted. Possible explanations for this include the over-riding effect of a curbside recycling program in Model 2, and the presence of weak measures, especially in the case of efficacy. A measure of efficacy that tapped specific interest in, and hope for change with regard to, the environmental issue being studied may have resulted in stronger effects. With regard to the unexpected direction of mobility perceptions, it is possible that the relative deprivation measured with mobility perceptions does not share any of the effects that measures of more absolute disadvantage have on behaviour. Too much weight should not be given to the unexpected direction of mobility perceptions, however, given that it is not statistically significant. Speculation aside, the fact remains that the expectation that the higher costs of participation for those who are socially and economically disadvantaged would result in a positive effect of income, education, occupational status, mobility perceptions and efficacy on environmental behaviour was not, for the most part, supported by the models used in this study.

Age and gender did not have statistically significant effects on environmental attitudes or on any of the behaviours studied. As previously mentioned the direction of the effect of age on attitudes was unexpected. However, the positive and insignificant effect of age on recycling behaviour and consumer purchasing is in line with that found in other studies.

Finally, in an overview of model similarities the analyses of total and indirect effects deserve mention as well. The ability to assess total effects in the proposed models provided additional information, the most pronounced of which was the strong indirect effect of education on all types of environmental behaviours studied. Another piece of information provided by the examination of total effects is that the only clear effect that

media exposure, as measured in this study, has on recycling and consumer purchasing behaviour is an indirect one due to the influence of media exposure on attitudes.

Attitude-Behaviour Consistency

As previously mentioned, examining the different correlational and predictive structures of attitudes and behaviour is a conceptually different task than that of examining the nature of attitude-behaviour relationship itself. Both analyses were completed in this study and the results outlining the determinants of attitude-behaviour consistency for those cases where levels of concern exceed behaviour are listed in Table 6. The fit of the model to the data was acceptable in all of the three cases examined.

In Model 1 the only variable that predicted the consistency between general environmental attitudes and consumer intentions was age. Younger people in this sample were more likely than older people to display consistency between their level of concern about the environment and the amount more they were willing to pay for environmentally safe products. Only four percent of the variance in consistency between attitudes and intentions is explained by this equation, a figure which was not statistically significant at the .05 level. Given the reservations already expressed about using behavioural intentions as measures of behaviour, it follows that more substantively interesting conclusions can be drawn regarding consistency between environmental concern and reports of actual behaviour.

In Model 2 both education and access to a recycling program affected the consistency between general concern and number of items recycled. Access to a recycling program, compared to no access, had the strongest effect. Thus, not only does a curbside program result in increased levels of recycling when controlling for attitudes, it also increases the level of consistency between attitudes and behaviour such that positive environmental attitudes will have a greater impact on behaviour for those people who have access to a curbside program than for those who do not[31].

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[31]As mentioned in Chapter 3, proposing a structural equation model to examine the consistency between attitudes and behaviour is one way of exploring for interaction between environmental attitudes and the other explanatory variables in a study of behaviour. As before, interpretations of the results are based on the assumption that

Table 6 - Structural Equation Results For Attitude-Behaviour Consistency

Explanatory Variables	*Consistency Model 1*		*Consistency Model 2*		*Consistency Model 3*	
	U	***S***	***U***	***S***	***U***	***S***
Age	-.020*	-.176*	.006	.052	.000	.003
Education	-.033	-.049	.110*	.149*	-.025	-.033
Income	.002	.027	.003	.037	-.006	-.062
Occupation	-.002	-.018	-.008	-.052	-.005	-.032
Gender	-.139	-.042	-.286	-.079	-.015	-.004
Party ID	-.243	-.065	-.113	-.028	-.632*	-.149*
Access			1.670*	.459*		
Media Exposure	-.012	-.003	-.044	-.011	.057	.014
Children	-.130	-.039	.100	.027	.551*	.144*
Mobility	.162	.055	-.446	-.114	-.690	-.160
Efficacy	-.001	-.001	.201	.074	.030	.012
Health					.096	.088
Political Ideology	-.072	-.045	-.038	-.022	-.158	-.089
R-Squared	.040		.304*		.095*	
Goodness of Fit	.961		.962		.959	
Adjusted Goodness of Fit	.916		.913		.907	
Chi-Square/DF	1.53		1.34		1.59	
N	328		298		337	

Structural equation coefficients are unstandardized (U) and standardized (S) gamma coefficients calculated using maximum likelihood estimates. These should be interpreted like regression coefficients produced using ordinary least squares estimation.

*Estimates are significant beyond the .05 level.

The effect of education on recycling behaviour when attitudes was one of the variables controlled for, as reported in Table 3, fell just short of reaching significance at the .05 level. However, the effect of education on the consistency between environmental concern and recycling behaviour was clearly significant. Higher levels of education in this sample resulted in greater consistency between environmental concern and recycling behaviour.

Consistency between environmental concern and attempts to purchase organic foods for Model 3 is affected by political party identification and the presence of children in the home, and 10 percent of the variance in consistency is explained by the variables in the model. Given that identification with the New Democratic Party, compared with non-identification, predicted increased environmental concern as well as decreased attempts at organic food purchases in the equation outlined in Table 4, it is not surprising that identification with the New Democratic Party emerged as a variable responsible for decreased consistency between general environmental concern and organic food purchases.

The presence of children in the home was a variable that predicted the purchase of organic foods when attitudes were controlled for. It is also a variable that predicts consistency between environmental attitudes and the purchase of organic foods. Respondents who had children under 18 in the home were more likely than those who did not to respond to environmental concerns with corresponding behaviour in the form of organic food purchases.

The examination of attitude-behaviour consistency constituted an exploratory aspect of this study and the implications of the results obtained will be commented on in the next chapter. The analysis of the results will be made bearing in mind that what was examined were measures of consistency between a small number of specific behaviours and general environmental concern. Different results and increased explanatory power may have resulted with different measures of behaviour and with measures of concern

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the major direction of influence is from attitudes to behaviour, although the possibility of a reciprocal influence is acknowledged.

specific to the behaviour in question. Nevertheless, the inclusion of a measure of consistency between environmental concern and behaviour does serve to add to an understanding of the factors affecting environmental behaviour within the limits of this study, and suggests possibilities for expanding analyses in future studies.

Confirmatory Results

The reduced model used to confirm results obtained in the 1990 analysis of recycling behaviour is shown in Figure 4. To arrive at this model all paths with standardized effect coefficients less than .100 were taken out of the 1990 model with the exception of age. The decision to leave age in the reduced model was based on the fact that the standardized coefficients measuring the effect of age were moderate for both attitudes and behaviour (.077 and .074) respectively and, although there is some evidence that the importance of age is declining as a determinant of attitudes, there is still enough uncertainty around this issue, and around the effect of age on environmental behaviours, to continue controlling for this variable in present studies[32].

The means and standard deviations for the variables used in the 1991 reduced model are listed in Appendix II and the structural equation results are listed in Table 7. The structure of support for environmental attitudes is substantially different in this sample. Education and party identification are no longer significant predictors of concern, and age emerges as a predictor in the direction most commonly found in the literature, that being greater concern displayed by younger people. The effect of political ideology and media exposure, however, remained consistent with that found in the 1990 sample. The positive effect of liberal political beliefs on environmental concern was significant at the .1 level and media exposure remained a positive and significant predictor of attitudes as it was in the 1990 sample.

These results call into question the reliability of the item used to assess environmental attitudes. The fact that general environmental attitudes are widespread in

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[32]A measure of efficacy (which had a standardized coefficient of .075 in the recycling equation) was not available in the 1991 survey. Had it been, this effect would have been controlled for as well.

FIGURE 4

1991 REDUCED MODEL FOR RECYCLING BEHAVIOUR

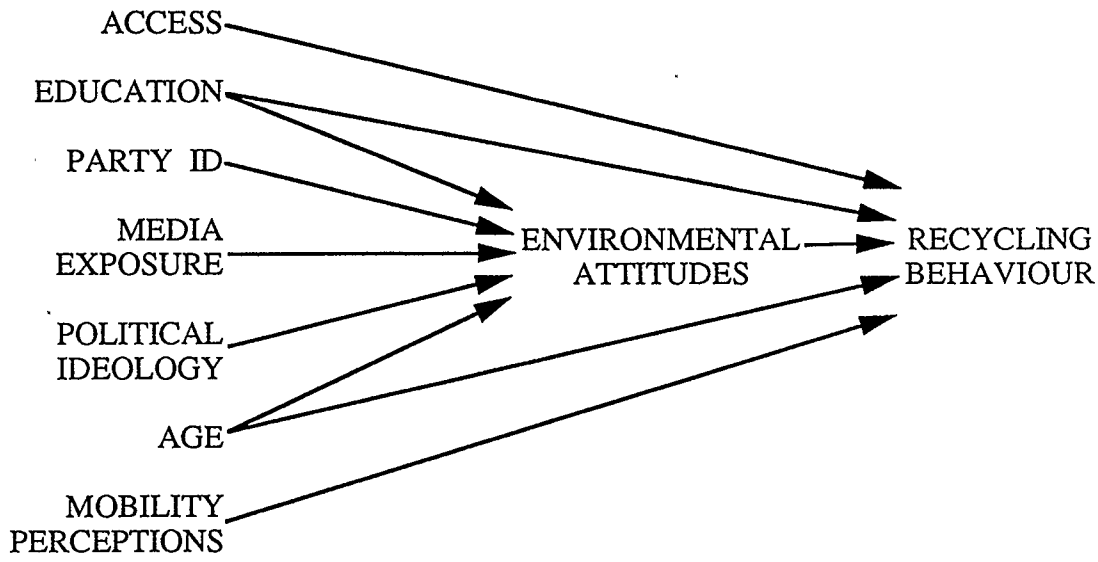

Table 7 - Structural Equation Results For Recycling Behaviour - 1991 Model

	Environmental Attitudes		*Recycling Behaviour*	
Explanatory Variables	***U***	***S***	***U***	***S***
Age	-.007*	-.090*	-.001	-.006
Education	.011	.023	.049	.066
Party ID	.073	.026	____	____
Access	____	____	1.959*	.510*
Media Exposure	.244*	.318*	____	____
Mobility	____	____	.135	.054
Political Ideology	.053	.083	____	____
Attitudes			.144*	.092*
R-Squared	.117*		.279*	

Goodness of Fit = .992
Adjusted Goodness of Fit = .928 N = 471
Chi-Square/DF = 3.45

Structural equation coefficients are unstandardized (U) and standardized (S) gamma and beta coefficients calculated using maximum likelihood estimates. These should be interpreted like regression coefficients produced using ordinary least squares estimation.

* Estimates are significant beyond the .05 level.

the population has contributed to difficulty in explaining variance and determining the structure of support for environmental protection in previous studies, and is likely a factor here as well (Van Liere & Dunlap, 1980). Many of the effects traditionally associated with environmental concern are weak ones, and consequently the possibility of different results due sampling fluctuations is higher than if the effects found were strong ones, especially if sample sizes are small. In this sample, media exposure, the strongest predictor of environmental concern in the 1990 sample, remains a significant predictor of environmental attitudes in the 1991 sample even though the strength and effects of other variables changed.

Confidence in the determinants of recycling behaviour as assessed in the 1990 sample is enhanced by the results of the 1991 test. Both increased environmental concern and access to a curbside recycling program are again significant predictors of recycling behaviour. Increased levels of education fell short of significance at the .05 level but, as in the 1990 sample, it was significant at the .1 level. Although the directions of age and mobility both changed in this equation, they were, again, not significant predictors of recycling behaviour[33].

The fit of this model to the data is acceptable with a goodness-of-fit index of .992, an adjusted goodness-of-fit index of .928 and a chi-square to degree of freedom ratio of 3.4[34]. Twenty-eight percent of the variance in recycling behaviour is explained in this reduced model, while 12 percent of the variance in attitudes is explained.

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[33] The correlations of mobility with the other variables was significantly different in the two samples. For example in the 1990 sample the correlation of mobility with education was .225 while in the 1991 sample it was .051. This suggests the possibility of an error in the measurement process with regard to this variable in one or both of the samples. In any case the degree to which the 1990 and 1991 measures of mobility are comparable is debatable.

[34]Incidently, the fit of this model improves greatly if the path between access to a recycling program and environmental attitudes is freed. In this sample, access to a recycling program does become a weak, but significant predictor of attitudes, providing further reason for caution in interpreting the results of the 1990 equation for environmental attitudes.

CHAPTER 5
CONCLUSIONS

The significance of a research project such as this is enhanced by the degree to which it contributes to an understanding of the barriers associated with environmental action, and to an understanding of the ways in which environmental behaviour can be encouraged. This study provided information on the determinants of environmental concern, the determinants of specific environmental behaviours and the strength of the relationship between the two. It also provided information about the factors associated with mobilizing the concern that exists by increasing the consistency between environmental attitudes and behaviour. Although the conclusions that can be drawn from this research are limited by the specific nature of the behaviours studied and the measurement weaknesses associated with the use of secondary data analysis, it does have contributions to make to knowledge in the area of environmental attitudes and behaviours, and offers methodological and theoretical suggestions for consideration in future research.

Findings with regard to the hypotheses offered around environmental attitudes and behaviours will be summarized in this chapter as will the findings and implications of the exploratory study of attitude-behaviour consistency. This will be followed by a discussion of the limitations associated with this study and the implications for future research suggested by both the limitations and the findings.

Environmental Attitudes

High levels of general environmental concern were common in this study, a finding not unexpected given past research. Attitudes were influenced by education, political party identification, media exposure and health concerns. A comparison of these results with the determinants of attitudes in the same city in 1991, however, casts doubt on the reliability of the findings with regard to education and party identification. Media exposure, a strong determinant of attitudes in both years, was determined by means of a limited measure. Media exposure, as measured in this study, tapped an interest in watching television programs that dealt with environmental issues. This measure does not necessarily tap the amount of specific information about environmental issues or

behavioural options that people obtain from all media sources. However, although this variable is no doubt reciprocally affected by environmental concern[35], it may provide some information about the effect of the presentation of environmental issues in the media, and the ability of media coverage to influence people's impressions and degree of concern.

Environmental Behaviours

Regardless of the determinants of environmental attitudes, attitudes themselves were predictors of behaviour in all cases. The strength of the relationship between attitudes and behaviour, however, was weak. This was not unexpected given that attitudes and behaviour were not measured on the same level of specificity, and given what is known about the strength of the attitude-behaviour relationship and the costs associated with collective behaviour as outlined in social psychological and rational choice theory respectively. As suggested by these theories, factors other than environmental concern had stronger effects on environmental behaviour in this study.

There was little evidence to support the hypothesis that participation in the environmental activities studied would vary with socio-economic advantage due to the higher costs of participation for those who are disadvantaged. There was, however, evidence to support the hypothesis that the personal costs and risks associated with both environmental problems and environmental behaviours, would affect levels of participation. Access to a curbside recycling program, which lowered the costs of time, money, knowledge and energy associated with recycling resulted in a marked increase in recycling behaviour, and concerns about the safety of food resulted in increases in the purchases of organic foods.

The other variable that resulted in increased purchase of organic foods was the presence of children in the home. Even when controlling for environmental concern and concerns about the safety of foods, the presence of children resulted in greater

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[35]The fact that media exposure does not directly affect recycling behaviour or consumer purchases, while attitudes do, suggests that viewing preferences are not measuring the same concept as that measured by environmental attitudes in this study.

participation in this case, presumably because people are concerned about what is best for their children[36]

The fact that attitudes was only one of several variables to affect behaviour, and a weak one at that, points to the need for a closer examination of the attitude-behaviour relationship in an attempt to understand which variables will increase the effect of environmental concern on behaviour. This is especially important if policy decisions aimed at fostering individual lifestyle changes focus on changing attitudes through information provision.

Attitude-Behaviour Consistency

Existing environmental concern had a greater positive effect on recycling behaviour when respondents had higher levels of education and when respondents had access to a recycling program. Increased education is associated with the ability to more easily access and process information and results in greater awareness and less confusion about the seriousness of issues and their consequences (Morrison & Dunlap, 1986: 583; Roper Organization, 1990: 55). It is also associated with increased social advantage.

The finding that those with access to a curbside program display greater consistency between attitudes and behaviour is most applicable to those concerned with immediate policy initiatives. This result suggests that people who have positive environmental attitudes are more likely to act on their concern by increasing recycling if mechanisms are available to make the behaviour more feasible. To the extent that this finding is replicable, it would seem that a focus on providing information about the seriousness of the problem would have a greater pay-off in terms of increased behaviour when social arrangements, such as the presence of a curbside program, favour ease of action.

The presence of children in the home is the other variable that predicted increased consistency between environmental concern and behaviour, in this case when the

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[36]There was a small positive correlation (.101) between presence of children and health concerns, but it is possible that people may believe that organic foods are better for children even if they are not convinced that non-organic foods are unsafe.

behaviour represented attempts to purchase organically grown food products. This finding suggests that, in some cases, people are more likely to act on their concern if they are responsible for the care of children. Of interest is whether inclusion of this variable in future research examining the consistency of environmental concern with consumer purchasing and other types of environmental behaviours will yield similar results.

Notable among the variables that did not affect consistency in any model was media exposure. It is interesting to note that although media exposure increased the level of environmental concern in this sample, it only affected behaviour indirectly (in Models 2 and 3), and it did not increase the consistency between attitudes and behaviour. This provides further support for the suggestion that those things which increase levels of concern will not necessarily result in substantial increases in behaviour unless the factors that influence the relationship between attitudes and behaviour are heeded.

The methodological decision to study attitude-behaviour consistency by creating a measure of consistency, and using this as a dependent variable in a structural equation model, provided information about the magnitude of the effects of various factors on the attitude-behaviour relationship. Another approach to this question is also available, however, that being the inclusion of product terms between attitudes and other explanatory variables in a model predicting behaviour. This statistical technique is commonly used to test for interaction effects in regression models (Pedhazur, 1982: 427-29). Although both of the techniques discussed provide information about the interaction of attitudes and other variables as it affects behaviour, each provides somewhat different information. The approach used in this study can provide useful information about the constant effects of various factors on the environmental attitude-behaviour relationship (Jaccard et al., 1990: 14-15). The latter technique, the use of product terms, can provide information about both the amount of additional variance in behaviour that is explained by the interaction of attitudes with other predictor variables, and about the effects of attitudes on behaviour at different levels of any moderator variable, and as such also deserves consideration in future research (Pedhazur, 1982: 427-28; Jaccard et al., 1990: 26-27).

Limitations and Implications For Future Research

Secondary data analysis often results in measurement compromises and this study was no exception. More precise measures in many areas would have improved confidence in the research findings. One of the more obvious measurement shortcomings is related to the general nature of environmental concern as measured in this study. Had specific measures of concern relating to waste management, pesticide use, and industrial pollution resulting from the production of consumer products, been available, the strength of the relationship between environmental attitudes and behaviours, and attitude-behaviour consistency, could have been more accurately assessed.

Efficacy, a variable suggested by social psychological research, and linked to class analysis, is another variable that suffered from lack of specificity in this case. Given that some of the error that existed as a result of model specification was no doubt due to the weak effects of several variables, it is reasonable to conclude that the fit of a model such as this one, and information regarding the strength and nature of the individual effects, may be improved in future studies if more accurate measures are employed.

The specific nature of the behaviours studied also suggest ways in which future research can be expanded. For example an interesting research problem exists in the comparison of the predictive structures of other consumer behaviours with that of the purchase of organic foods. With regard to recycling behaviour, Oskamp et al. (1991) point out that different results can be expected from studies of recycling behaviour in the presence of a curbside program, given the large reduction in personal costs that this program provides. The city of Calgary provides an example of a community which does not currently have a curbside recycling program, but is in the process of instituting instead, a city-wide green box program. This program provides easier access to recycling depots by making drop-off bins available in each neighbourhood, thus reducing the transportation distance to depots and the difficulty associated with locating the depots[37]. Obviously this program does not provide the same convenience as a curbside program, but it does reduce some of the costs involved in recycling for all residents, rather than

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[37]Information obtained from the Calgary Recycling Hotline.

just for those who live in houses. It seems reasonable to expect that results regarding the variation in participation across social groups due to socio-economic advantage may differ, in a setting such as this, from that which was found in the present study.

This project dealt only with specific consumer actions and recycling behaviour and many specific determinants of the behaviours studied are linked to the specific nature of those behaviours. This limits generalization to other environmental behaviours, individual or political. Given the recent nature of the phenomenon of environmental behaviours, and the seriousness of the issues at stake, further research into all types of environmental behaviour is clearly required.

Although predictions regarding many of the specific causes of behaviours other than those studied can not be made, the existence of some similarities in the nature of the determinants of environmental behaviour found in this study does allow for comment on the hypotheses made concerning the effect of attitudes on behaviour and the predictions that costs associated with the behaviour will affect participation. General concern about the environment did have a weak positive effect on all of the behaviours in this study and this supports previous research findings which suggest that environmental attitudes do have limited influence on environmental behaviours. In addition, in each of the last two models studied, the alleviation of costs associated with behaviour, or increased personal risk associated with the problem, resulted in higher levels of participation. The findings of this study thus provide some support for the theories on which these hypotheses were based and provide justification for the use of a model which includes both attitudinal influences and the influences associated with individuals' experience with social structure.

A final comment on the implications of this study and directions for future research can be made by examining the wider societal considerations suggested by the research. As was shown in this study, general environmental concern did have a weak effect on the specific behaviours considered, and presumably more specific attitudes would have a somewhat stronger effect on specific behaviours. This suggests that attempts to promote environmental lifestyle changes by increasing attitude strength through information provision would meet with some success. However, the results of this study also suggest that this success would be limited unless the concerns in question

become immediate personal ones or societal mechanisms are put in place to make compliance with environmentally responsible behaviour relatively cost free compared to the alternatives. Murray Bookchin echoes this sentiment when he states "can we blame working people for using cars when the logistics of American society were deliberately structured ... around highways?" (Bookchin, 1980: 39).

This analysis suggests that governments, which have the power to provide and enforce societal incentives and disincentives, have an important role in facilitating environmentally responsible behaviour. However, the degree to which the state can accomplish this has been questioned given the often conflicting obligations of governments to environmental protection and production expansion (Schnaiberg, 1980: 244-46). This suggests the need to focus research on the political and economic barriers that exist when the state attempts to deal with environmental issues.

Closing Remarks

This study, despite its limitations, does contribute to the knowledge in the area of environmental attitudes and behaviour. It provides information about recycling and consumer purchasing behaviour in a Western Canadian city, within the limits outlined. As such it contributes to Canadian research on environmental issues and provides information to compare with that found in other areas of Canada, the United States, and other areas of the world where environmental lifestyle changes are occurring. The methodological and statistical procedures used in this project also provided several types of information about the environmental behaviours studied, including the indirect effect of explanatory variables on behaviour as mediated by attitudes and the determinants of attitude-behaviour consistency. The research findings did provide some support for theoretical explanations based on the costs and benefits of participation and for specification of a model which includes the effects of both attitudes and social experiences. Finally, the findings and limitations associated with the study suggested several directions for future research, the continuation of which is essential given the magnitude of environmental problems which face all societies.

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APPENDIX I - INDICATORS OF POLITICAL IDEOLOGY

Construct	Observed Measures
Political Ideology	What priority should the government give to higher day care standards? (Polido 1).
	What priority should the government give to government approved after-school care programs? (Polido 2).
	What priority should the government give to a universal school lunch program? (Polido 3).
	What priority should the government give to maternity leave benefits? (Polido 4).
	The government cannot afford to pay for new programs for children. (Polido 5).

Note: All items are coded 1 through 7, with 7 representing a liberal attitude toward government spending on social programs.

APPENDIX II - MEANS AND STANDARD DEVIATIONS FOR MODELS 1-3 (1990) AND MODEL 2 (1991)

	Model 1		*Model 2*		*Model 3*	
Variable	Mean	S D	Mean	S D	Mean	S D
Age	38.282	14.472	38.500	14.484	38.186	14.186
Income	39.032	20.920	38.603	20.854	38.686	20.834
Education	8.791	2.442	8.694	2.501	8.715	2.461
Occupation	44.158	12.481	44.012	12.534	43.958	12.443
Gender	.509	.501	.511	.501	.508	.501
Party ID	.276	.448	.272	.446	.266	.442
Access			.586	.493		
Media	.294	.456	.289	.454	.288	.454
Children	.404	.491	.406	.492	.407	.492
Mobility 1	2.221	.723	2.222	.716	2.226	.718
Mobility 2	2.331	.737	2.331	.731	2.336	.732
Efficacy 1	3.858	1.039	3.861	1.033	3.853	1.035
Efficacy 2	4.291	1.059	4.306	1.054	4.302	1.052
Health					4.797	1.719
Polido 1	5.520	1.498	5.508	1.535	5.517	1.519
Polido 2	5.134	1.650	5.125	1.683	5.136	1.676
Polido 3	4.686	1.856	4.719	1.860	4.734	1.841
Polido 4	5.090	1.763	5.108	1.759	5.121	1.742
Polido 5	5.081	1.970	5.086	1.975	5.110	1.966
Attitudes	5.936	1.336	5.900	1.393	5.901	1.396
Behavioural Intentions	1.744	.992				
Recycle			3.267	2.307		
Purchase Organic Foods					3.155	1.941

	1991 Model	
Variable	Mean	S D
Age	39.223	16.151
Education	8.607	2.549
Party ID	.238	.426
Access	.584	.493
Media	5.304	1.586
Mobility	2.176	.758
Polido	5.155	1.926
Attitudes	5.828	1.214
Recycle	3.168	1.906

APPENDIX III - CORRELATIONS AMONG EXPLANATORY VARIABLES[a]

MODEL 1

1. Age	1.									
2. Education	-.205	2.								
3. Income	-.012	.299	3.							
4. Occupation	.005	.536	.412	4.						
5. Gender	.067	.052	.253	.132	5.					
6. Party ID	-.062	-.008	-.099	.011	-.082	6.				
7. Media	.000	.019	-.019	-.002	.008	.087	7.			
8. Children	-.153	.037	.176	.026	-.151	-.018	-.024	8.		
9. Mobility	-.201	.215	.318	.235	.107	-.008	-.044	-.003	9.	
10. Efficacy	.280	.169	.284	.261	.151	-.056	.084	.006	.262	10.
11. Polido	-.182	-.039	-.211	-.145	-.233	-.014	.015	.154	-.098	-.279

MODEL 2

1. Age	1.										
2. Education	-.230	2.									
3. Income	-.036	.315	3.								
4. Occupation	-.018	.554	.412	4.							
5. Gender	.077	.043	.253	.115	5.						
6. Party ID	-.047	-.010	-.094	.001	-.064	6.					
7. Access	.243	.019	.398	.080	.137	-.031	7.				
8. Media	-.007	.026	-.009	.000	.023	.092	.025	8.			
9. Children	-.167	.044	.176	.031	-.154	-.022	.097	-.027	9.		
10. Mobility	-.224	.225	.308	.238	.113	-.004	-.162	-.018	-.004	10.	
11. Efficacy	.282	.139	.273	.239	.155	-.064	.134	.082	.004	.261	11.
12. Polido	-.182	-.025	-.205	-.134	-.256	-.023	-.289	.005	.162	-.065	-.274

MODEL 3

1. Age	1.										
2. Education	-.233	2.									
3. Income	-.037	.301	3.								
4. Occupation	-.025	.542	.403	4.							
5. Gender	.061	.049	.254	.120	5.						
6. Party ID	-.076	-.016	-.106	-.014	-.074	6.					
7. Media	-.006	.036	-.011	.008	.014	.084	7.				
8. Children	-.150	.042	.179	.031	-.152	-.016	-.032	8.			
9. Mobility	-.299	.239	.288	.239	.132	-.015	.019	.003	9.		
10. Efficacy	.278	.156	.275	.245	.148	-.064	.078	.002	.252	10.	
11. Health	.097	-.144	-.060	-.108	-.093	.053	.064	.101	-.203	-.180	11.
12. Polido	-.181	-.037	-.206	-.143	-.243	.003	.030	.172	-.095	-.269	.101

[a] Taken from the standardized PHI Matrix