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Responsible Environmental Behaviour:
A Test of the Hines Model

Karen Hayward
B.A., York University, 1988

THESIS
Submitted to the Social-Community Programme
of the Department of Psychology
in partial fulfillment of the requirements
for the Master of Arts degree
Wilfrid Laurier University
1990

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My greatest inspiration, however, was my father; it is in his loving memory that this thesis is dedicated.

Abstract

As the number and salience of environmental problems have increased so have the number of studies which investigate environmentally responsible behaviour. Hines (1984), after conducting a meta-analysis of this literature, identified crucial variables which predict responsible environmental behaviour. While Hines has proposed a crude model which contains the variables thought to explain this type of behaviour, she has failed to hypothesize about the relationships that exist amongst many of these variables. The present study, therefore, was designed to develop a more elaborate model which attempts to explain some of these relationships, as well as predict responsible environmental behaviour. The sample consisted of students, staff and faculty at Wilfrid Laurier University (WLU). Results from a series of multiple regressions, zero-order correlations, and partial correlations revealed that a sense of Personal Responsibility, Knowledge of Action Strategies, Worry, and Age were direct predictors of Responsible Environmental Behaviour, while several other variables indirectly predicted this type of behaviour. Implications for educators, activists and policy-makers are discussed. For example, greater knowledge of the foremost variables related to environmental activism can be significant in developing educational materials that are most likely to inform, as

well as mobilize citizens. In addition, several findings specific to WLU will be used to inform decisions made by the administration's "3 Rs Committee" at WLU.

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Air and water pollution, waste management, depletion of natural resources, and thinning of the ozone layer: these are all environmental concerns facing us today. Not surprisingly, Canadians are becoming increasingly aware of and concerned about these environmental problems. A recent Gallup poll revealed that "almost the entire Canadian adult population (97%) state an awareness of the dangers of pollution" (Bozinoff & MacIntosh, 1989, p. 1). In the 20 years since Gallup began asking this question, this statistic has never been higher. Is this environmental concern, however, being translated into environmental action?

As indicated above, Canadians are becoming increasingly aware of environmental deterioration. It is less clear, however, whether Canadians are engaging in responsible environmental behaviour congruent with their concern. That is, although an increasing number of Canadians are aware of environmental problems, probably a much smaller percentage is actively engaged in trying to prevent or reduce environmental deterioration. It seems likely that apart from recycling, which has escalated dramatically with the increasing availability of "blue boxes", individuals rarely alter their environmental behaviour to be more consistent with their environmental concern. For example, it is likely that only a small percentage of individuals modify their driving habits due to environmental pollution created by

exhaust fumes. Thus, it appears that in some situations (e.g., recycling) individuals do act in accordance with their concern, while in other situations they do not (e.g., driving habits).

This lack of consistency between environmental concern and responsible environmental behaviour is particularly conspicuous within the university milieu. For example, within Southern Ontario it appears that only the University of Guelph has a comprehensive campus-wide recycling program, supported financially and structurally by the administration. Guelph University's comprehensive program involves the recycling of paper, as well as glass and tin. Recently, several other universities have attempted recycling initiatives at their respective institutions (e.g., Brock, McGill, McMaster, Queen's, Ryerson Polytechnical Institute, Trent, University of Ottawa, University of Toronto, University of Waterloo, and York) and have been moderately successful.¹

The Wilfrid Laurier University administration, however, has only very recently implemented a fine paper recycling program. Recycling efforts prior to this had been the responsibility of concerned students. In addition, it has also been only recently, after some pressure from the

¹ This information was gathered from a report written by the Waterloo Public Interest Research Group in 1989. Thus, I recognize that perhaps further recycling efforts could have been initiated since that time.

student union, that the university has hired a student to act as "environmental coordinator". The environmental coordinator, with the help of student volunteers, will now be responsible for the recycling of newspaper and tin on campus. The university's commitment to fine paper recycling becomes suspect when one considers the money that can be generated from this venture. In comparison, newspaper and tin recycling is much less lucrative. In light of the plethora of environmental problems, it is especially disappointing that positive environmental action, such as a full-scale campus-wide recycling program, has yet to be established within this institute of higher learning.

Consequently, the purpose of the present study is two-fold. First, this study is designed to investigate variables which appear to predict responsible environmental behaviour and develop a subsequent model. As discussed previously, Canadians are becoming increasingly aware of environmental problems. However, it is likely that significant behavioural change has not resulted from this increased awareness. In fact, it appears that very little is known about what prompts individuals to become environmentally active. Thus, it appears plausible that in addition to concern, other variables are critical to predicting responsible environmental behaviour. This study has been undertaken, in part, due to an understanding that identification of these moderating variables has important

implications for educators, activists, and policy-makers. Accordingly, I am interested in furthering our knowledge of these factors that enhance the likelihood of environmental activism, with the expressed purpose of enhancing the efforts of those who are attempting to increase environmental activism among the general public.

Secondly, results from the present study will be utilized to inform the administration at WLU about the level of support on campus for various environmental endeavours. For example, I anticipate that results from this study will indicate that students, staff, and faculty at WLU are supportive of a campus-wide recycling program, and thus demonstrate to the administration that such an initiative is both desirable and necessary. Consequently, it is hoped that the results of this research can have a direct social impact on this university environment by contributing to the implementation of environmental initiatives, such as a campus-wide recycling program.

Before detailing the present study, therefore, this introduction will review variables found by previous research to be associated with responsible environmental behaviour.

Responsible Environmental Behaviour

A considerable amount of research has been conducted in the area of environmentally responsible behaviour. Social scientists from a variety of fields have attempted to

further our understanding of this type of behaviour. In an attempt to provide the reader with a sound theoretical background in this research, in the following section I will review variables that have been associated with responsible environmental behaviour.

Throughout the studies reviewed below, "responsible environmental behaviour" has been defined in a variety of ways. Usually researchers have used a variety of behavioural criteria including purchase choice, recycling, writing to legislators, and supporting environmental groups. I ask that the reader keep this factor in mind when reviewing the following list of variables that have been identified as being linked with this type of behaviour. Nonetheless, for the purposes of the present study, responsible environmental behaviour is defined as actions "initiated by the individual with the intention of remediating an identified environmental problem" (Hines, 1984, p. 19).

Knowledge of environmental issues. Research has shown that environmental knowledge is often associated with environmental action (Arbuthnot, 1977; Buunk, 1981; Hines, Hungerford & Tomera, 1987). As would seem logical, individuals who engage in environmentally responsible activities are usually cognizant of environmental issues, concerns, and problems.

However, although it has been demonstrated that

environmental knowledge is related to environmental activism, it is unclear whether this knowledge was gained prior to participation in environmental action activities. Borden and Schettino (1979) argue that knowledge is not necessarily a precursor to environmental action. That is, individuals with little factual environmental knowledge could become active because of significant concern for the quality of the environment. Once involved in environmental activism, these individuals could acquire greater knowledge of environmental issues through this involvement. Hines, Hungerford, and Tomera (1987), however, surmise from their research that knowledge is a precursor to engaging in responsible environmental behaviour. The evidence, therefore, appears to be equivocal as to whether environmental knowledge must precede environmental action, but in any case it does appear to be related to this type of behaviour.

Knowledge of action strategies. In addition to knowledge of environmental issues, perceived knowledge of and skill in using environmental action strategies have also been identified as crucial variables when predicting responsible environmental behaviour (Sia, Hungerford, & Tomera, 1985-86; Jordan, Hungerford, & Tomera, 1987). For example, an individual might be concerned about the condition of the environment but might have little knowledge of how to alter environmental problems. Thus, it is

important that the individual be aware of actions that he or she can engage in (e.g., purchasing safer products, recycling, supporting environmentalist groups, etc.) and feel skilled in using these action strategies.

Hence, knowledge of environmental issues, associated with environmental activism, includes both knowledge of the problems, as well as knowledge of action strategies directed at correcting these problems. In addition, potentially environmentally active individuals must feel skilled in using these action strategies aimed at reducing environmental deterioration.

Attitudes. In addition to knowledge of environmental issues and action strategies, and perceived skill in using those strategies, an individual's attitudes toward the environment are also important determinants of environmental activism (Weigel & Weigel, 1978; Borden, 1984-85; Sia et al., 1985-86). Individuals who engage in this type of behaviour have been shown to express a caring attitude toward the natural environment. Environmentally active individuals also appear to be concerned about environmental quality in general and express a willingness to engage in activities to reduce environmental deterioration (Weigel & Weigel, 1978). In particular, these individuals express a negative attitude toward environmental pollution and its effects (Borden, 1984-85; Sia et al. 1985-86).

Furthermore, a negative attitude toward technology has

also been associated with responsible environmental behaviour (Borden, 1984-85). That is, environmental activists generally do not believe that a "technological fix" is the answer to many environmental problems. Borden (1983) speculates that our Western belief in technology will preclude pro-environmental behaviours and thus "many people will remain stuck in inactivity, awaiting--hopefully or hopelessly--the 'technological fix(es)'" (p. 18).

Level of environmental sensitivity. In addition to one's general attitudes toward the environment, an individual's "level of environmental sensitivity" has also been shown to be related to responsible environmental behaviour (Sia et al., 1985-86). Sia et al. measured "environmental sensitivity" by how often an individual participated in outdoor activities as well as the individual's affect toward the environment. These investigators discovered that an individual's level of environmental sensitivity was important in predicting responsible environmental behaviour. That is, they established that environmental activists usually felt a fondness toward the environment and participated in more outdoor activities.

Personal harm. In addition to the above variables that have been identified as being associated with responsible environmental behaviour, Manzo and Weinstein (1987) discovered that "personal harm" was also a variable related

to this type of behaviour. That is, these authors found that environmentally active members of the Sierra Club were much more likely than non-active members to state that they, or members of their family, had somehow personally suffered from environmental deterioration. In fact, activists were three times more likely than non-activists to believe that they (or their families) had somehow "suffered harm from an environmental problem" (p. 684). For example, one participant believed that he/she had contracted a blood disease from swimming in a polluted lake.

Manzo and Weinstein speculate that the active Sierra members held these beliefs prior to their involvement in environmental action. However, it could be that exposure to greater amounts of information and literature led already-active members to believe that they had somehow suffered from the state of the environment. Thus, as these authors point out, these questions could only be answered by querying members prior to joining and following them over time to determine "whether pre-existing differences or differing experiences within the Club explain which individuals take on an active role" (p. 691). It is possible, however, that both of these hypotheses are true. That is, it is plausible that environmental activists believe that they could have suffered some personal harm from an environmental problem prior to becoming active, and then have those beliefs confirmed and/or reinforced by other

activists once they have become active.

Sense of personal and citizen efficacy. Perceptions of efficacy is yet another variable that has been associated with environmental activism. A variety of researchers have determined that individuals who participate in environmental action usually feel that as individuals, or working in groups, they are capable of making needed changes in the environment (Arbuthnot, 1977; Buunk, 1981; Manzo & Weinstein, 1987; Sia et al., 1985-86). For example, Manzo and Weinstein (1987) discovered that perceived efficacy of citizen action was one variable that distinguished environmentally active Sierra Club members from inactive members. The active members were much more positive about the effectiveness of actions such as writing to legislators, campaigning, and lobbying, etc., than were non-active members. This perceived efficacy is not exclusive to environmental activists; it has been demonstrated that peace activists also perceive that their political actions will be efficacious (McKenzie-Mohr & Dyal, 1988).

Locus of control. Thus far, the variables associated with environmental activism have been specific to the environment. However, several studies have examined the relationship between locus of control and responsible environmental behaviour (Arbuthnot, 1977; Tucker, 1978; Trigg, Perlman, Perry, & Janisse, 1976).

The locus of control concept is not specific to the environment or environmental issues. This concept refers to the degree to which individuals believe that reinforcers and other external occurrences are contingent upon their own behaviour. "Internal" individuals tend to believe that their rewards are contingent upon their own abilities, effort, and skill; "external" individuals tend to believe that their rewards are contingent upon luck, chance, or powerful others (Trigg et al., 1976, p. 307). S o m e research has demonstrated that internal individuals are more environmentally active than external individuals (Arbuthnot, 1977; Trigg et al., 1976; Tucker, 1977).

However, Heubner and Lipsey (1981) argue that the locus of control concept "may be of limited use as a predictor of behavior in specific situations" (p. 46). Heubner and Lipsey demonstrate that a situation-specific locus of control measure was much more powerful than a generalized locus of control measure in predicting environmental activism.

The application of this concept within the field of responsible environmental behaviour may be of little use or value to environmental educators and researchers. The problems of using this concept to predict environmental activism will be discussed in greater detail later in the paper.

Demographic Variables. Certain demographic variables have also been linked to environmentally responsible behaviour (Arbuthnot, 1977; Van Liere & Dunlap, 1980; Dunlap, Grieneeks, & Rokeach, 1983). For example, Arbuthnot (1977) found that an individual's level of education was one variable that helped to predict the likelihood of recycling behaviour. Van Liere and Dunlap's (1980) review of demographics related to environmental concern appears to be the most comprehensive one in this area. The authors assessed several demographic variables including age, sex, income, education, occupational prestige, residence, political party, and political ideology. It is important to note, however, that Van Liere and Dunlap used environmental concern not behaviour as their dependent variable. That is, Van Liere and Dunlap reviewed articles which assessed one's self-reported affect toward the environment, not one's involvement in behaviour directed toward improving the quality of the environment.

From their review of the literature, Van Liere and Dunlap (1980) concluded that four of the above demographic variables appeared to be consistently related to environmental concern. Thus, the demographic profile of an environmentally concerned individual that emerged was as follows: this individual was usually young, educated, urban, and "liberal" in political ideology. Van Liere and Dunlap concluded that income, occupational prestige,

political party affiliation, and gender were not crucial variables in predicting environmental concern. Nonetheless, these authors caution that studies investigating any of the previously mentioned demographic variables in combination "typically explain only 10 to 15 percent of the variance in environmental concern" (p. 193). Further, demographic variables are, for the most part, not easily altered and hence do not lend themselves to efforts aimed at increasing environmental activism.

Dunlap, Grieneeks, and Rokeach (1983) also investigated the relationship between demographic variables and responsible environmental behaviour. Specifically, these authors examined the socioeconomic status (SES) of the individuals in their study. Their results are similar to the results found by Van Liere and Dunlap (1980). Dunlap et al. discovered that individuals who recycled (Dunlap's measure of responsible environmental behaviour) were more highly educated and had a higher income in comparison to those individuals in their study who did not recycle.

As can be seen from the above list, a variety of variables has been identified by researchers as being associated with environmentally responsible behaviour. These variables have been identified from a variety of different disciplines, including education, psychology, sociology, engineering, political science, business, forestry, and communications (Hines, Hungerford, & Tomera,

1987). Research devoted to environmentally responsible behaviour from these different fields has produced a vast amount of information. However, as Hines et al., (1987) point out:

...the lack of substantive ties between many of these fields has led to a situation in which it is particularly difficult to remain informed about current developments in environmental behavior research....That is, that while a tremendous variety of variables have been investigated in relation to behavior in an environmental context, there is at present no agreement among researchers as to which of these variables appear to be most strongly associated with responsible environmental behavior (p.2).

As a result of this fragmentation of information, Hines (1984), in her dissertation, attempted to synthesize the literature from the variety of disciplines interested in this field of research. Her analysis and the model that emerges from her research is discussed below.

In her attempt to cover all the relevant literature, Hines (1984) reviewed several sources which included Psychological Abstracts, GEO Abstracts, Educational Resources Information Center, Dissertations in Eco-Education, Ecology and the Environment: A Dissertation Bibliography, as well as several others. Reference lists

from studies located in the above journals were also reviewed to locate sources which may not have surfaced in the preliminary search. From this search a list of 380 studies for possible inclusion in her study emerged. Because not all of these studies were considered particularly relevant, this number was eventually reduced to 128.

Hines (1984) then conducted a meta-analysis of these studies in an attempt to identify the most crucial variables associated with responsible environmental behaviour. From this analysis she found that several categories of variables emerged:

Cognitive variables. Hines included factors pertaining to knowledge of the environment or to some aspect of an environmental issue in this category. This included knowledge of environmental issues and their consequences and/or knowledge of how to take action on any particular environmental problem. Seventeen studies were analyzed which dealt with cognitive variables and some form of environmental activism, and a low correlation between these two variables was found ($r = .299$, $SD = .195$). Thus, she had some support to contend that greater knowledge of environmental issues and/or action was associated with responsible environmental behaviour.

Psycho-social variables. A variety of psycho-social variables including attitudes, locus of control, economic

orientation, personal responsibility, and verbal commitment were also meta-analyzed in relation to environmental behaviour. In all, 69 studies dealt with these variables. Fifty-one of these studies were interested in the attitude-behaviour relationship with regard to environmental issues. Although the correlations were low, Hines found that favourable attitudes toward the environment ($r = .347$, $SD = .224$), an internal locus of control ($r = .365$, $SD = .121$), and some degree of personal responsibility ($r = .328$, $SD = .121$), were all associated with responsible environmental behaviour. As well, she found that verbal commitment was moderately associated with this type of behaviour ($r = .491$, $SD = .130$).

Demographic variables. The demographic variables that Hines included to be meta-analyzed were age, income, education, and gender. She discovered that education was weakly associated with responsible environmental behaviour ($r = .185$, $SD = .122$). Hines also concluded that the relationship between age and responsible environmental behaviour was weak ($r = -.151$, $SD = .200$). That is, the author found slight support for stating that younger and more educated individuals engage in responsible environmental behaviour more often than older and less educated individuals. It was also determined that the relationship between income and responsible environmental behaviour was weak ($r = .162$, $SD = .084$). Thus, individuals

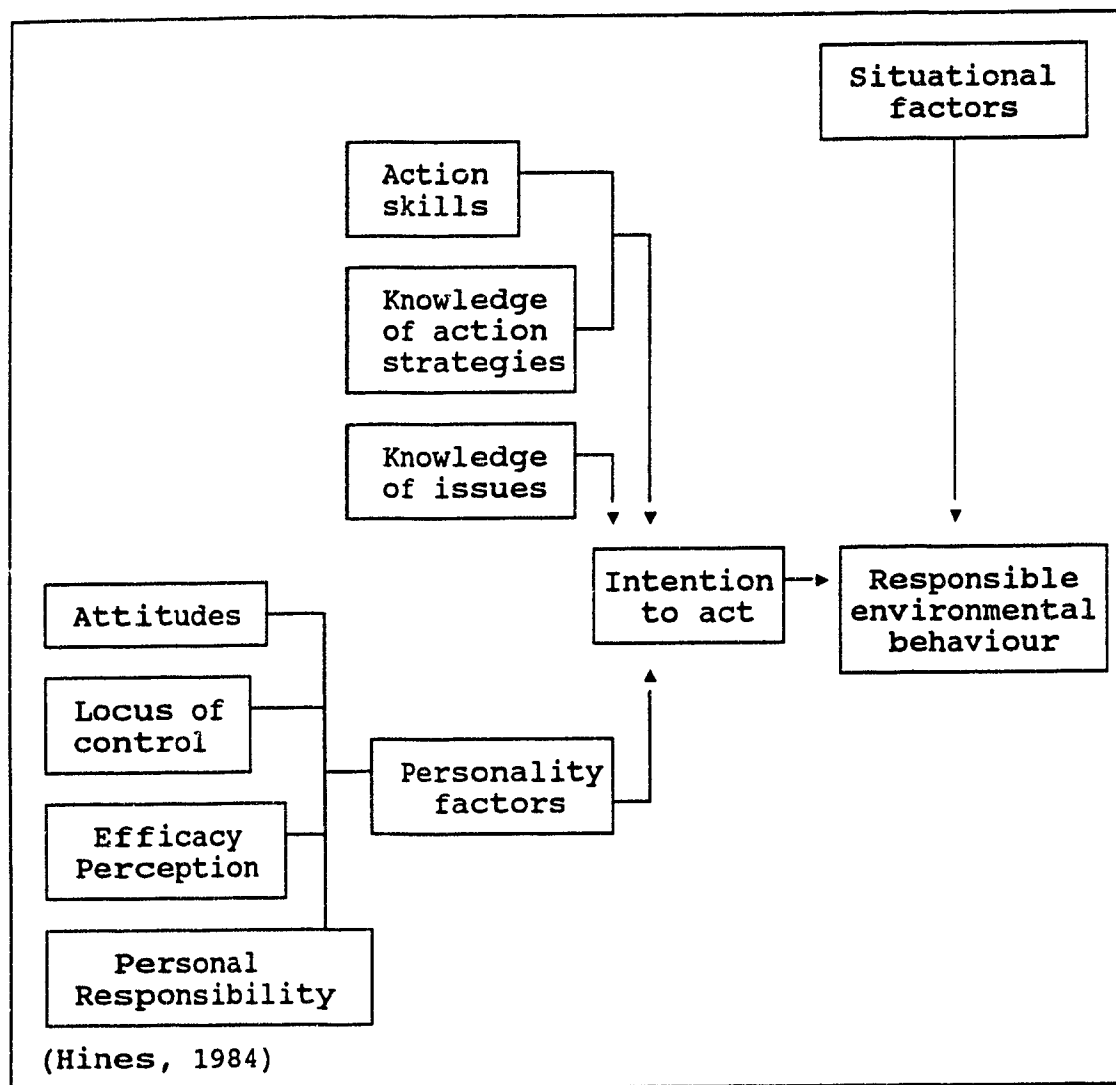
with higher incomes were only slightly more likely to have reported engaging in responsible environmental behaviour than individuals with lower incomes.

Behavioural intervention approaches and classroom strategies. Hines was unable to meta-analyze experimental studies that attempted to induce environmentally responsible behaviour through classroom strategies, due to the diversity and small number of these studies. However, through "narrative integration" of these findings, she did conclude that classroom strategies that emphasized a variety of factors (e.g., knowledge of environmental issues, discussion of alternative solutions to these problems, problem-solving skills, etc.) and which were not short-term (e.g., one day) were effective in increasing the incidence of pro-environmental behaviours.

Meta-analysis of experimental studies which employed behavioural intervention strategies to induce responsible environmental behaviour was conducted on a total of ninety studies. Hines concluded that behavioural intervention strategies were effective in increasing the incidence of the target behaviours. The target behaviours examined in these studies were primarily littering and energy consumption.

From further examination of the above categories and her data, Hines proposed a series of crucial variables which predict responsible environmental behaviour and proposed a simplified model (see Figure 1).

FIGURE 1: Variables Proposed by Hines to Predict Responsible Environmental Behaviour



Hines (1984) concluded from her research that an individual's intention or commitment to behave was most strongly associated with responsible environmental behaviour. Thus, as shown in the model above, the proposed direct antecedent to responsible environmental behaviour is the intention to act. However, the intention to act in an

environmentally responsible manner is believed to be "merely an artifact of a number of other variables acting in combination" (Hines et al., 1987, p. 6).

Before an individual can intend to act on a particular environmental issue, this individual should first be aware of and knowledgeable about a particular problem. In addition, this individual must also possess some knowledge of strategies that he/she can employ. Although she did not include this variable in her meta-analysis, Hines (1984) also speculated that the individual should possess some skill in performing the course of action deemed appropriate to the environmental problem. Nevertheless, the above described abilities are still not sufficient to lead to action. The individual should also possess the desire to act in a responsible environmental manner. This desire, it is proposed, is influenced by a host of personality factors, including attitudes toward the environment, locus of control, efficacy perception and feeling some degree of personal responsibility for improving environmental quality. In addition, even if the individual possesses all the necessary factors, responsible environmental behaviour still may not occur due to situational factors, which are thought to impact directly on behaviour, as opposed to the "intention to act". These may include "economic constraints, social pressure and opportunities to choose different actions" (Hines et al., 1987, p. 7). For

example, an individual may strongly believe in the work done by an environmental organization but because of lack of money or time is unable to contribute to this organization. It also seems probable that situational factors could also encourage environmental activism (e.g., the easy availability and use of blue boxes).

Thus, Hines has hypothesized a crude model which contains variables thought to best predict participation in environmental activism. The model predicts that seven variables impact upon the "intention to act" which she proposes best predict "responsible environmental behaviour". She further proposes that "situational factors" impact directly upon behaviour. However, aside from these hypotheses, she does not propose how the variables in her model interact with each other. In addition, she has not empirically tested her model, and therefore the accuracy is unknown. Hence, the present study was designed to test the accuracy of the Hines model and subsequently to develop a more elaborate model proposing the relationships that exist among the variables, and the strengths of those relationships.

This study is undertaken with the intention of furthering our knowledge of the factors which enhance the likelihood of environmental activism. However, from a review of the relevant literature, several variables not

included in the Hines' model also appear to be pertinent. These variables and the modifications made to Hines' (1984) model are discussed below.

The Present Study

As mentioned above, the present study was designed to test whether Hines (1984) was correct in her identification of crucial variables which predict responsible environmental behaviour and to develop a more elaborate model which predicts this type of behaviour. From a review of the environmental behaviour literature it appears that the Hines model could be expanded to include "tactical efficacy" and "social support" as well as several demographic variables. In addition, a closer examination of "situational factors" was thought to be necessary.

Tactical Efficacy

Several researchers have discovered that individuals who are engaging in responsible environmental behaviour feel that their tactics (e.g., writing to politicians, petition-signing, lobbying, etc.) will be effective in helping to alter environmental problems (Manzo & Weinstein, 1987; Sia et al., 1985-86). The perceived tactical efficacy among environmental activists parallels the perceived efficacy of disarmament activists (McKenzie-Mohr & Dyal, 1988). That is, disarmament activists are more likely than attitudinally similar non-activists to perceive that their tactics (e.g., lobbying, petition-signing, etc.) will be effective in helping to reduce arms race activities (e.g., cruise missile testing). Therefore, for these reasons, this variable will also be included in the analyses conducted.

Social Support

Manzo and Weinstein (1987) in their investigation of the differences between active and non-active Sierra Club members, found that active members were much more likely to have friends who belonged to the Sierra Club than non-active members. They also discovered that active members were also likely to have family members involved in the club as well. Thus, an individual may be more inclined to act in an environmentally responsible manner if he or she has the support of friends and family, also engaging in this type of behaviour. It was speculated, therefore, that social support may be important in predicting responsible environmental behaviour, thus it will also be included in the model to be tested.

Situational Factors

Recall that Hines et al. (1987) suggest that "economic constraints, social pressure and opportunities to choose different actions" (p. 7) may prevent an individual from engaging in responsible environmental behaviour, even though they possess all of the other necessary characteristics. This variable will be examined in greater detail in the present study, because it was surmised that situational support (or lack thereof) could affect whether or not an individual engages in responsible environmental behaviour.

Hines (1984) has primarily investigated characteristics of the individual, therefore all but ignoring the "goodness-

of-fit" between individuals and environments (Heller, Price, Reinharz, Riger & Wandersman, 1984). Two questions, therefore, were included in the questionnaire that assess the extent to which a lack of environmental support prevents participants from engaging in responsible environmental behaviour. For example, I hypothesized that some individuals may feel that lack of support from the community may prevent them from becoming more environmentally active. Thus, one item assessing this factor was included in the survey. In addition, one question included in the questionnaire will evaluate the degree to which respondents feel that it is easy to recycle fine paper, newsprint, and cans on the WLU campus.

Nevertheless, although I investigated this variable in greater detail, the unit of analysis is still the individual, not social systems. It is certainly recognized that systems-level political and economic issues are vitally important to the remediation of environmental problems. Indeed, many behaviours advocated by environmentalists (i.e., reducing and reusing) are threatening to consumer North America and the status quo. Thus, I acknowledge this as a limitation of the present study, and I will be discussing this issue later in the paper.

Demographic Variables

Hines (1984) found that the demographic variables that she reviewed (i.e., education, income, economic orientation,

age and gender) were either only weakly associated (age and education) or not at all associated (income, economic orientation, and gender) with responsible environmental behaviour, and therefore she excluded these variables from her model.

However, Van Liere and Dunlap (1980) found that age, education, and political ideology were consistently associated with environmental concern. Recall also that Arbuthnot (1977) found that level of education was related to environmental activism, and Dunlap et al. (1983) discovered that education and income were related to this behaviour. Therefore, it was hypothesized that these demographic variables (i.e., age, education, income, and political ideology) could be important in predicting responsible environmental behaviour and should be included in the model. Furthermore, I hypothesized that whether or not the respondent has children could also be relevant to the model.² For these reasons, therefore, this variables was also included in the modified model.

Locus of Control

Locus of control will not be included in the modified model of responsible environmental behaviour. I have

² In a recent study of nuclear armament attitudes, researchers discovered that the value one placed on children was inversely related to pro-armament attitudes (Feshbach, Kandel, & Haust, 1985). Thus, it was hypothesized that perhaps this variable could also be associated with pro-environmental attitudes and behaviour.

decided not to include this variable for three reasons. First, Rotter (1975), in response to the deluge of research conducted in this area, argued that the locus of control concept has often been misused. He claims that investigators often fail to treat reinforcement value, in a given situation, as a separate variable. Rotter explains that,

The problem arises particularly in studies of social action, social protest, independence, conformity, etc....[An] internal person may not protest, be a member of a protest group, or sign a petition, simply because he does not believe in the cause; he may feel that his best interests lie in some other kind of activity, or he may merely feel that the particular action involved is bad strategy (p. 59).

Thus, locus of control is suspect when being used within the context of social action; which would be the case in the present study.

Secondly, as stated previously, Huebner and Lipsey (1981) argue that a situation-specific locus of control measure is much more predictive of environmental activism than a generalized locus of control measure. That is, perceptions of efficacy specific to the environment must be relatively equal to behavioural actions if consistency is to arise. These findings parallel Ajzen and Fishbein's (1977,

1980) research which asserts that attitudinal and behavioural entities must be comparably equal for consistency between attitudes and behaviour to emerge.

Although Huebner and Lipsey (1981) refer to the concept they measured as "locus of control" (albeit, situation-specific), I would argue that they are, in fact, referring to "efficacy perception" as defined by Hines (1984). Hines defines efficacy perception as,

an individual's perception of his or her effectiveness or role in a given situation. It was expressed as a sense of powerlessness in a given situation or as a belief in one's abilities to help alleviate environmental problems (p. 73).

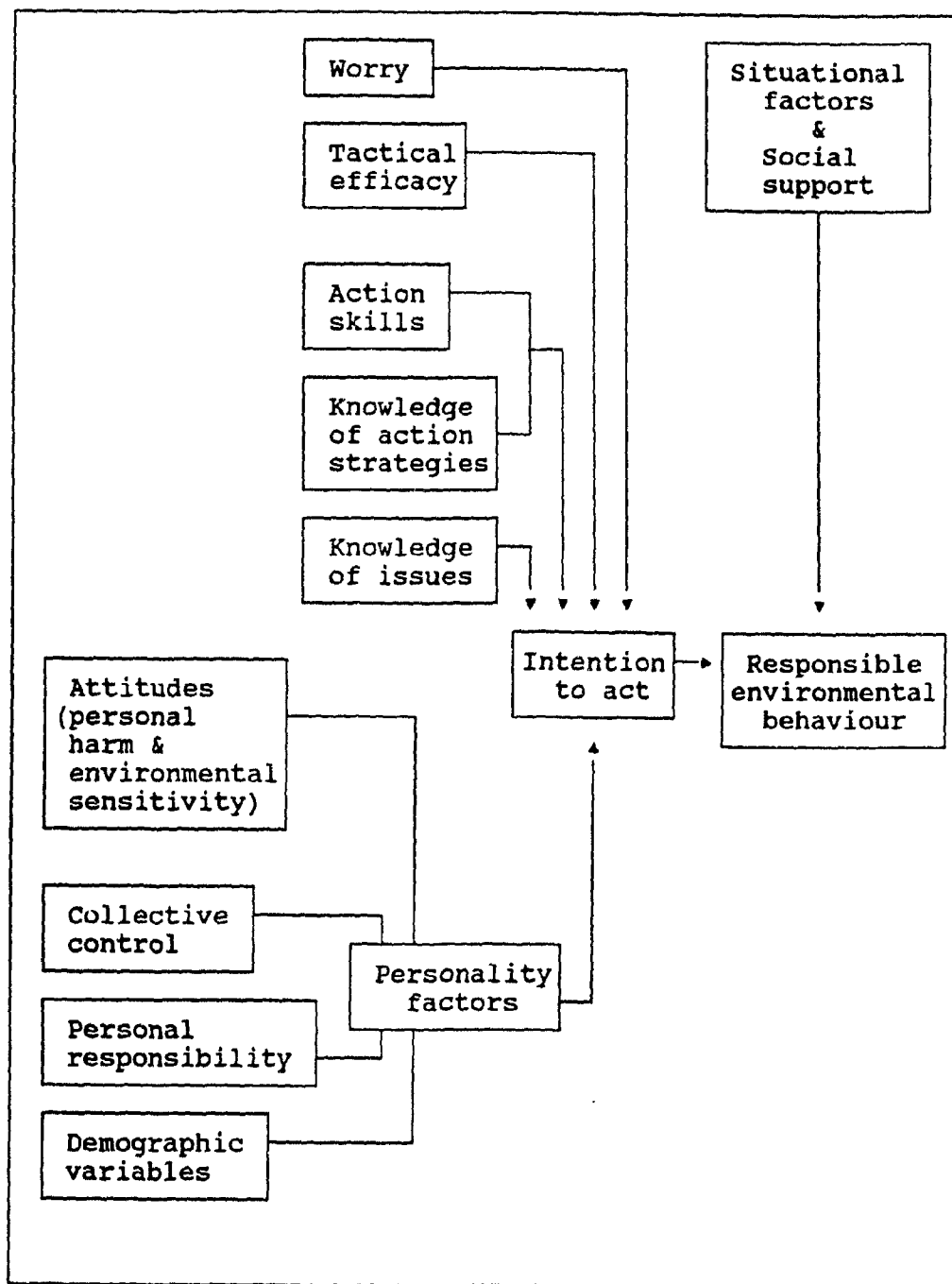
Thus, I surmised that an individual's efficacy perception would be much more crucial than locus of control in predicting responsible environmental behaviour.

Moreover, I hypothesized that an individual's perceived efficacy of collective efforts, rather than individual efforts would be more predictive of environmental activism. In testimony to this hypothesis, McKenzie-Mohr (1988) has established that perceptions of collective control distinguish peace activists from attitudinally-similar non-activists. Hence, the variable "collective control" will assess perceived efficacy of environmental efforts made by an individual in collaboration with others.

Finally, locus of control is a fairly stable personality characteristic and thus is not easily altered. As stated previously, one of the purposes of this study is to provide environmental educators with a further understanding of what factors influence environmental activism. This understanding could prove beneficial in developing educational materials that will mobilize individuals. Thus, knowing that locus of control is one of these factors is of little value to these educators, if this trait cannot be easily modified. However, as Huebner and Lipsey (1981) discovered, perceptions of efficacy with regard to environmental problems can be modified. Therefore, this finding can have practical significance for environmental educators.

Thus, for these three reasons, locus of control will not be included in the analyses. Consequently, the model has been revised to include these changes. The revised model is illustrated below:

FIGURE 2: Variables Proposed by the Present Study to Predict Responsible Environmental Behaviour



As can be seen above, in this modification of Hines' (1984) model, the range of personality factors which are believed to influence the intention to act in an environmentally responsible manner have been slightly modified. Hines' list of personality factors believed to influence the intention to act included attitudes toward the environment and taking action, locus of control, efficacy perception, and the degree to which an individual feels personally responsible for the quality of the environment. In this modification of the Hines' model these factors have been revised somewhat: several demographic variables (age, education, income, political ideology, and whether or not the participant has children) have been included and locus of control has been excluded.

As well, "efficacy perception" has been revised and now is referred to as "collective control" and will assess the participant's opinion of how efficacious collective actions are. Moreover, it was speculated that there may be clusters of attitudes that could be important to predicting responsible environmental behaviour. For example, two variables identified previously as being associated with responsible environmental behaviour, "environmental sensitivity" and "personal harm", could be subsets of attitudes that may be relevant to this type of behaviour. Thus, several questions assessing these variables will be included in the measure utilized in this study.

In addition, how often a participant worries about the destruction of the environment was also included in the modified model. How often one worries about nuclear holocaust is one variable that has been found to distinguish peace activists from attitudinally similar non-activists (McKenzie-Mohr, 1988). Fiske (1987), after examining people's beliefs and feelings about nuclear war, argued that "heightened issue salience" is critical in motivating people to become active. That is, individuals are more likely to become activists if they are repeatedly reminded of the dangers of a particular situation. Thus, although not included in the original Hines (1984) model, or found in my review of the environmental literature, I speculated that the amount an individual worries about the deterioration of the environment (i.e., how salient the issue is to him or her) could be an important variable in this research as well.

Further, an individual's perceptions of tactical efficacy will be examined in an attempt to determine this variable's impact on the individual's intention to act in an environmentally responsible manner.

Lastly, recall that Hines (1984) hypothesized that situational factors impact directly on behaviour. As mentioned earlier, I hypothesized that the amount of social support an individual has for engaging in responsible environmental behaviour could also be an important

situational factor. Thus, this variable will also be examined.

In summary, Hines (1984) proposed a model that attempts to explain responsible environmental behaviour. The model, illustrated previously, included several variables that, in combination, are proposed to predict this type of behaviour. However, the model is somewhat undeveloped, and has not been tested empirically. I have hypothesized in the present study (after conducting further research) that the model needed some revisions before being tested empirically. Hence, modifications to her model of responsible environmental behaviour were made and described. As well, the present study is undertaken to also explore the relationships that exist among the variables in the revised version of the Hines model, and to subsequently develop a more elaborate model which predicts responsible environmental behaviour.

Environmental Issues and Community Psychology

It may not be apparent to the reader how an analysis of environmental activism is related to the field of community psychology. In relating an investigation of responsible environmental behaviour to this discipline, it makes sense to start with an understanding of what community psychology is. Community psychology emerged in the 1960s when psychologists started to recognize "that individual behavior and psychological well-being, the traditional concerns of

psychology, could not be fully understood in isolation from broader social issues" (Heller et al., p. ix, 1984). This recognition lead to a conceptual reorientation and the birth of community psychology. This paradigm shift resulted in a new emphasis on prevention and competence, and community psychologists adopted an ecological focus to well-being (Heller et al., 1984). An ecological perspective stresses the interaction and fit between persons and their environments, and contends that to prevent problems, the match of resources between these two entities must be determined (Nelson, 1983). This model was (and is) in stark contrast to the traditional model of psychology which focussed (and focusses) on an individual's pathology and subsequent treatment. Community psychology was advocating an holistic approach to mental health and well-being.

This paradigm shift is, in fact, a shift toward social intervention and systems-level thinking. It is a realization that the malady may not always be with the individual but may instead be with the system. Thus, what may become necessary is a "higher logical level of problem-solving which considers changing the assumptions, values, structural relations, and rules governing the system itself" (Bennett, 1987, p. 13). This type of change is referred to as "second-order" change, as opposed to "first-order" change which accepts the system's assumptions and tries to make modifications within that system. Social interventions

directed toward second-order change could vary considerably, depending upon the social change desired. That is, the intervention could be geared toward cultural, ideological or educational reformation or it could involve trying to alter legal or political policies (Bennett, 1987).

Because of this new emphasis, the scope of community psychology is quite vast, and subsequently work performed by community psychologists is varied.

Community psychologists are interested in the health and well-being of all members of a community. They are concerned about deleterious environmental conditions and the impact of such problems on behavior. Their concern is not just to spotlight dangers but also to reinforce helpful practices that aid in the development of psychological competence. The work of community psychologists is focused on improving community life for all citizens, in preventing disorders, and in promoting psychological well-being in the population (Heller et al., pp. 4-5, 1984).

Thus, the roles that community psychologists adopt can be quite diverse, due to the many aspects involved in developing a healthy community. Nevertheless, certain core values are evident among practitioners in this field.

Several core values inherent in community psychology include an increased concern for the deleterious effects of

environmental conditions and social inequities, empowerment, promoting a psychological sense of community, and encouraging a close collaboration between scientists and citizens (Heller et al., 1984). In addition, community psychologists are particularly concerned with the relationship between research and social action. As scientists they wish to research the deleterious effects of environmental conditions within a community and then use that research, and their skills as community consultants, to help citizens become empowered and improve those conditions.

From the above discussion it becomes apparent that the present study is quite consistent with, and important to, the field of community psychology. A healthy environment is one significant ingredient in a healthy community. An unhealthy or hazardous environment can lead to stress and subsequent psychological distress, not to mention the physical symptoms that can arise from such conditions. Thus, it is important to try to reduce these detrimental effects and improve the quality of the natural environment.

Therefore, what may become important to community psychologists is knowledge of the variables which prompt individuals to become environmentally active and subsequently trying to encourage this type of behaviour. Consequently, it is evident how the research carried out in the present study could be very important to the discipline of community psychology. Once we become aware of what

variables best predict environmental activism, we can begin to work with communities to engage them in these activities. Hence our research can result in some positive social action.

Nevertheless, it is important to realize that I have conducted a psychological investigation of a social issue. The emphasis is on the individual not on political, economic, and social structures. Thus, although I hope to utilize the results to effect change at this university, I am not working toward second-order change. This is both a bias and a limitation of the present study. That is, the emphasis is on changing the behaviour of the individual, when in fact the problems may lie in the larger social systems. A discussion of how my results will be disseminated, in an effort to improve WLU's environmental agenda, will be addressed later in the paper.

Nonetheless, although the present study was not designed to exact second-order change, it is still important to the discipline of community psychology. Investigations such as this can be utilized effectively to help initiate necessary changes in local neighborhoods. As community psychologists we can share our research and expertise with local leaders and citizens. Collaborating and consulting with these individuals can result in their empowerment and subsequent action. The end result, hopefully, will not only be a healthier natural environment but also a greater

sense of community. These issues will also be addressed later in the discussion.

Method

Participants

Two hundred and sixty-four students, staff and faculty at Wilfrid Laurier University (WLU) were contacted by myself or a trained interviewer and asked to participate in a phone survey.³ Students were randomly selected from the listing of all undergraduate and graduate students. Staff and faculty were randomly selected from the employee and faculty phonebook.

Procedure⁴

Prior to being called, I mailed potential respondents an introductory letter, list of scales, and a consent form (see Appendices One, Two and Three). The letter informed the participants that he/she would be phoned and asked to participate in a telephone survey. The letter also explained that they had been randomly selected to participate and that the survey would assess "his or her thoughts, feelings and behaviours concerning environmental issues and problems." Furthermore, participants were told that their participation was strictly voluntary, that they could omit any questions they wished or withdraw at any time, and that their responses would be kept completely

³ I solicited the assistance of five undergraduate students, who had expressed an interest in environmental issues, to help me with the data collection.

⁴ It should be noted that the questionnaire was piloted with several individuals to determine whether it was an appropriate length and to identify any confusing questions.

confidential. If the respondent was interested in participating, he/she was requested to sign and mail back the consent form. Individuals who mailed back the consent form were subsequently called by myself or a trained interviewer. Using a prepared script, the interviewer reiterated the purpose of the study and asked if the respondent was still willing to participate (see Appendix Four). Upon obtaining consent, the interviewer administered the twenty-minute phone survey that measured the variables outlined in the previously described modified Hines (1984) model (see Appendix Five). If the time was not convenient for the participant, a more convenient time was arranged.

Once these phone surveys had been completed, individuals who did not mail back the consent form were then contacted. A slightly modified script was used (Appendix Four), and again the interviewer reiterated the purpose of the study, and asked if the respondent was willing to participate. If he/she was willing, the procedure described above was again followed. If the respondent was unwilling to participate, he/she was asked to complete a short refusal survey (see Appendix Six). [See Appendix Four for wording of the request.] This helped to determine if there were any differences between those who wished to participate and those who did not.

Furthermore, when the participant had completed the questionnaire, the individual was asked whether he or she

was interested in the results, once the study was completed. If the participant was interested, their address was obtained. Once I have completed my thesis, a summary of the results of the study will be mailed to them. In addition, the summary will also notify participants that they have access to the entire thesis if they wish to read it.

Measure

The questionnaire utilized in this study measured all of the variables described in the modified model of responsible environmental behaviour. Recall that this included, (1) how often the individual worries about environmental destruction, (2) perceptions of tactical efficacy, (3) perception of action skills, (4) knowledge of action strategies, (5) knowledge of environmental issues, (6) attitudes toward the environment and taking environmental action, as well as level of environmental sensitivity and perception of personal harm suffered from environmental deterioration, (7) efficacy perceptions of collective control, (8) feelings of personal responsibility for environmental quality, (9) demographic variables including age, gender, education, income, political ideology, and whether or not the respondent has children, as well as (10) situational factors including time commitments to family, other organizations and career/school, economic constraints, as well as opportunity and situational support to engage in responsible environmental behaviour. In

addition, responsible environmental behaviour was measured by asking the respondent whether or not he/she had been involved in a variety of environmentalist activities.

The questionnaire used in this study was constructed using several sources (e.g., Sia et al., 1985-86; Maloney, Ward & Braucht, 1975; Weigel & Weigel, 1978; McKenzie-Mohr, 1988). These sources were consulted when relevant, however, most items in the questionnaire were constructed for the purposes of this study.

In keeping with suggestions made by attitude-behaviour consistency researchers, a level of specificity that was equivalent throughout the questionnaire was sought. After review and examination of the attitude-behaviour consistency literature, Ajzen and Fishbein (1977, 1980) have concluded that there is greater consistency between these two variables when the attitude measured is specific to the predicted behaviour. Ajzen and Fishbein (1977, 1980) argue that global measures of attitudes for predicting subsequent specific actions are of little value. Attitudinal and behavioural entities must be relatively equal for the relationship between attitudes and behaviour to be consistent. Accordingly, the level of specificity of environmental activities engaged in corresponds to the level of specificity of the attitudes, tactical efficacy perceptions, knowledge of environmental issues, and

knowledge of action strategies measured throughout the questionnaire.

However, in order to keep the questionnaire a reasonable length, questions assessing the participants' attitudes, tactical efficacy perceptions, knowledge of action strategies, and knowledge of environmental issues correspond to only a subset of the activities queried. That is, activities that I speculated many individuals will have engaged in (e.g., informing oneself about environmental issues) and activities in which only highly motivated individuals will have engaged (e.g., changing driving habits) were chosen as a "core" group or subset of activities. Questions which assess the variables listed above correspond to those activities only.

Worry

The questionnaire began with a question assessing how often the respondent worries about environmental destruction. Specifically, this question is as follows: "I'd like to begin by asking you how much you worry about the destruction of the environment". The six-point scale used for this item ranged from "1 - not at all" to "6 - almost every day".

Environmental Action Activities

In the present study "responsible environmental behaviour" was measured by examining several activities that the participant had engaged in. If a respondent answered

"zero" or "never" to one of the activities listed below, he or she was then asked how many times he/she has considered engaging in the activity. Activities assessed included informing oneself and others of environmental issues, changing behavioural actions felt to be environmentally destructive, purchasing products felt to be environmentally safe, voting for political candidates who support positive environmental action, supporting an environmentalist group, as well as making efforts to reduce waste and recycle.

The subset of activities chosen for the "core" group included: 1) encouraging others to be more supportive of protecting the environment; 2) informing oneself of environmental issues; 3) buying products thought to be environmentally safe; 4) using public transportation, carpools, or bicycles instead of cars; 5) donating money and/or time to an environmental organization; 6) trying to reduce the amount of paper used or produced; 7) purchasing paper products made from recycled paper fibre; and 8) recycling.

In addition to the complete list of activities assessed, two questions measuring environmental sensitivity were included in this section. This variable, as described earlier, has been found to be relevant in predicting responsible environmental behaviour. Environmental sensitivity was measured by the following questions: "When I was growing up, I spent a lot of time with family or

friends enjoying outdoor activities (e.g., camping, hiking, swimming, fishing, etc.)" and "Currently I spend a lot of time with family, friends, or on my own, enjoying outdoor activities (e.g., camping, hiking, fishing, etc.)."

This section of the questionnaire was arranged so as to empower the respondent. As mentioned earlier, empowerment is one value inherent in the work of community psychologists. In keeping with this, I did not want to construct the questionnaire in such a way that would make the respondent feel very inactive or disempowered. That is, it is recognized that many of the participants have not engaged in many of the activities evaluated. Hence, the first few activities queried were actions that the participant was more likely to have engaged in, hopefully making the participant feel more empowered. As well, the last activity assessed was also one in which the respondent was likely to have engaged, to avoid leaving the individual disempowered at the end of this section.

Attitudes

Attitudes toward the environment were measured utilizing a seven-point scale ranging from "1-strongly disagree" to "7-strongly agree". In total, nine questions assessed an individual's attitudes toward the environment. Eight of these attitudes corresponded to activities which constituted the core group. The level of specificity between the core group activities in the previous section was

maintained when investigating a participant's attitudes toward the environment. That is, for each environmental action activity in the core group, there was a corresponding attitude question. For example, the attitude statement "I believe in encouraging others, through informal discussion, to be more involved in helping to improve the quality of the environment" corresponded to the question "How many times in the past year have you engaged in an informal discussion, in order to encourage someone to be more supportive of protecting the environment" in the core group of the Environmental Action Activities section.

After constructing these items, it was felt that these questions also assessed one's intention to act in an environmentally responsible manner. It seemed likely that an individual's intention to engage in responsible environmental behaviour will be expressed by how strongly he/she agreed with statements such as the one above. That is, if an individual responded "strongly agree" to the statement about encouraging others to be more environmentally active, that individual is probably expressing a greater intention to engage in this behaviour than is the individual who agreed only slightly to the statement.

In addition to the attitude questions corresponding to the activities queried, the following question was also included in this section: "I believe that I have suffered

some personal harm from an environmental problem." As described previously, the extent to which an individual feels personally harmed by the environment has been found to be relevant in predicting responsible environmental behaviour.

Perceptions of Efficacy

A participant's perceived efficacy of collective efforts ("collective control") was measured by the following two questions: "In general, how much control do you feel that you, in collaboration with others, have in helping to improve the quality of the environment?" and "How much control or impact do you feel that you, in working with faculty, staff and students at Wilfrid Laurier University can have in helping to reduce the amount of waste or garbage that the university generates?". These two questions were measured by a seven-point scale ranging from "1-no control" to "7-total control".

Tactical efficacy perceptions were measured by questions which asked the respondents how effective certain environmental actions are in helping to improve the quality of the environment. As described earlier, questions which evaluate "tactical efficacy" perceptions corresponded to the core group of activities described earlier. For example, the question "How effective do you think using alternate forms of transportation (e.g., using a bicycle instead of a car) is in helping to improve the quality of the

environment?" corresponds to the environmental action query previously delineated. A seven-point scale ranging from "1-not at all effective" to "7-totally effective" was used for all of the tactical efficacy questions.

Knowledge of Action Strategies

A participant's knowledge of action strategies was measured by a series of questions that again corresponded to the core group of environmental action activities. For example, the question "To what extent do you believe that you are knowledgeable about forms of transportation that have minimal harmful environmental effects?" corresponded with the environmental action activity in the core group dealing with usage of alternate forms of transportation. A seven-point scale ranging from "1 - to no extent" to "7 - to a great extent" was used for this series of questions.

Perception of Action Skills

In order to keep the questionnaire a reasonable length and to avoid repetition with the "Knowledge of Action Strategies" section, one global question was used to measure the respondents' perception of skill level in using action strategies. The following question, "How skilled do you think you are in using the above tactics to help improve the quality of the environment?" followed the "Knowledge of Action Strategies" section. A seven-point scale ranging from "1 - not at all skilled" to "7 - greatly skilled" was used for this question.

Situational Variables

It was hypothesized that time commitments, economic constraints, lack of situational support or opportunity, and lack of social support were variables that may prevent individuals from becoming more involved in environmental action. Three questions measured whether time commitments to family and/or friends, other organizations, or to school and/or career prevented participants from becoming more environmentally involved. One such question was as follows: "To what extent do you believe that your time commitments to your family and/or friends prevent you from becoming more involved in activities that may help improve the quality of the environment?" A seven-point scale used for these questions, ranged from "1 - to no extent" to "7 - to a great extent".

One question measured the extent to which a participant perceived that economic constraints prevented him or her from becoming more environmentally active, by supporting environmental organizations. This question was as follows: "To what extent do you believe that economic constraints prevent you from supporting environmental organizations?" The same seven-point scale as described above was utilized.

Two questions measured whether respondents felt there was inadequate support or opportunity to become more environmentally active. These two questions were: "To what extent do you believe that lack of convenient recycling

containers prevents you from recycling fine papers, newsprint, and cans on campus?" and "To what extent do you believe that lack of community support, in general, for positive environmental action prevents you from becoming more involved in activities that may help improve the quality of the environment?". These two questions used the same seven-point scale described in the previous paragraph.

Lastly, as Manzo and Weinstein (1987) have speculated, social support may be influential in determining the extent to which an individual becomes environmentally active. Social support was measured by the following question: "Do you have friends, acquaintances, or members of your family who are presently involved in environmental issues?" The seven-point scale to used ranged from "1 - no" to "7 - more than 20".

Personal Responsibility

The extent to which a participant felt personally responsible for the state of the environment was measured by the following question: "How much personal responsibility do you feel for helping to improve the quality of the environment?" This item was measured along a seven point scale from "1 - no responsibility" to "7 - total responsibility".

Knowledge of Issues

Knowledge of environmental issues was measured by a series of statements that corresponded to the environmental

action activities queried earlier in the questionnaire. These statements were measured by a five-point true-false scale, from "1 - definitely true" to "5 - definitely false".

The knowledge questions dealt with a variety of environmental problems including problems created by increasing consumption of electricity, water pollution, deterioration of the ozone layer, harmful industrial processes, and insufficient recycling of waste, all of which corresponded to the environmental action activities. Thus the incorrect statement, "Most smog in our cities comes from industrial plants" corresponded to the environmental action activity in the core group which dealt with usage of alternate forms of transportation. [Most smog in our cities is caused by automobiles.]

In addition, at the end of this section the participant was asked whether or not he or she had ever taken a course in conservation, ecology, or environmental issues. This questions was included in order to determine if there were any differences between those who had taken a course and those who had not.

Demographic Variables

Several demographic variables were also assessed. These variables included age, gender, whether or not the participant was a student, educational background, combined family income, political ideology, and whether or not he or she had any children.

To determine a participant's political ideology the following question was asked: "Would you describe yourself as liberal, conservative, middle-of-the-road or other?" If the respondent answered "liberal" to this question, then he/she was asked "Would you say you are very liberal, somewhat liberal, or only moderately liberal?" If the respondent answered "conservative" to the question, then he/she was asked "Would you say you are very conservative, somewhat conservative, or only moderately conservative?" Thus, the scale used was a seven-point which ranged from "1-very conservative" to "7-very liberal". If the participant answered "other" then he/she was asked to specify.

One question was included in the questionnaire which assessed the level of support among students, staff and faculty for attending environmentalist seminars on campus. Specifically, this question was "If Laurier were to periodically offer one-hour seminars on environmental issues, how likely would you be to attend?" The scale to be used ranged from "1 - not at all likely" to "7 - extremely likely".

The questionnaire ended with two open-ended questions: "Is there anything you'd like to see Laurier do with respect to environmental concerns?" and "Did you have any comments about the questionnaire, or any questions you'd like to ask?" This gave respondents an opportunity to discuss

anything they wanted about the interview itself or about environmental issues in general.

Results

It will be recalled that the purpose of the present study was to determine which variables, alone and in combination, best predict responsible environmental behaviour, as well as to assess the accuracy of the Hines model. The original Hines model was compared with the modified version of that model developed in the present study, using a simultaneous multiple regression. In order to determine this, several multiple regressions were conducted, as well as a series of correlational analyses. From these procedures a preliminary path model was developed. However, prior to examining these results it was necessary to determine if there were any systematic differences between those participants who completed the survey (202 or 76.5%) and those who chose not to (43 or 16.3%), but did complete the refusal survey (see Appendices 5 and 6).⁵

Several differences were found between the two groups⁶. As shown in row one of Table 1, respondents who completed the full survey were more educated than those who chose not to, with a mean education level ($M=3.87$) close to "4 = college or university graduate", while the latter group's

⁵ Two hundred and sixty-four participants were contacted, and 19 (7.2%) refused to complete the full survey or the refusal survey.

⁶ The following t-tests are based upon pooled variance estimates.

mean education level was close to falling midway between "3 = some college or university" and "4 = college or university graduate" ($M=3.39$).

TABLE 1: DIFFERENCES BETWEEN THOSE WHO COMPLETED THE FULL SURVEY AND THOSE WHO COMPLETED THE REFUSAL SURVEY

Variable	Mean (s.d.) Full Survey N=202	Mean (s.d.) Refusal Survey N=43	<u>t</u>	<u>p</u>
Education	3.87 (1.02)	3.39 (1.12)	2.76	.01
Worry	4.76 (1.12)	4.28 (1.16)	2.56	.05
Coll. Cntrl.	4.40 (1.08)	3.68 (1.27)	3.72	.000
Soc. Support	3.37 (2.00)	2.71 (1.89)	1.95	.05

As shown in Table 1, the two groups also differed with respect to how often they worried about the deterioration of the environment. Respondents who completed the full survey reported worrying about environmental destruction just slightly less than "5 = once or twice a week" ($M=4.76$), while those who chose not to complete the survey worried a little more than "4 = once or twice a month" ($M=4.28$), $t(240) = 2.56$, $p < .05$.

The participants who completed the full survey were more likely to believe that collective efforts can be efficacious in helping to improve the quality of the environment. As seen in row three of the table, respondents who completed the full survey reported believing that they

had between "4 = some control" and "5 = considerable control" ($M=4.40$) in collectively helping to improve environmental quality, while those who completed the refusal survey reported having between "3 = little control" and "4 = some control", $t(241) = 3.72$, $p < .000$.

Lastly, the two groups also differed with respect to how many family, friends and acquaintances they knew who were involved in environmental issues. Participants who completed the full survey reported knowing a little more than "3 = a couple" of family, friends or acquaintances who were involved in these issues, while the refusal group reported having less than "a couple" of people they knew who were involved, but more than "2 = one" ($M=2.71$), $t(240) = 1.95$, $p = .05$.

Although these differences have been found to be statistically significant, their practical significance may be limited. Excluding "collective control", the differences in the means for each of these variables do not exceed one-half the standard deviation. Thus, in actuality the differences between the two groups may be minimal.

Because five interviewers were employed to administer the phone surveys, it was important to assess whether there were any effects due to who conducted the survey. Multivariate analysis across independent variables revealed no differences between interviewers, Hotellings $F = 1.42$ (ns).

A multivariate analysis was also carried out across the four groups, undergraduate and graduate students, staff, and faculty, which comprised the sample. It will be recalled that the findings from the present study will be generalized back to the university as a whole. The four groups of which the sample was composed are quite diverse and therefore it was anticipated that differences would be found. Not surprisingly then, several differences between students, staff, and faculty were found on a number of variables.⁷

⁷ The t-tests in the following table are based upon pooled variance estimates, and employed Fisher's Least Significant Difference (LSD) procedure to determine differences between the four groups in the sample. For more information on LSD, see Ott (1988).

TABLE 2: DIFFERENCES BETWEEN STUDENTS, STAFF, AND FACULTY

Variable	Mean Undergrads (s.d.) N=76	Mean Grads (s.d.) N=23	Mean Staff (s.d.) N=64	Mean Faculty (s.d.) N=38
1. Env'tal Activism	1273.65 (633.44)	1332.72 (526.75)	1673.90 (664.74)	1585.99 (665.38)
2. Env'tal Sensitivity	5.47 (1.60)	4.91 (2.02)	5.91 (1.49)	5.34 (2.10)
3. Attitudes	6.36 (.55)	6.57 (.42)	6.60 (.43)	6.35 (.73)
4. Personal Harm	4.09 (1.86)	4.04 (2.03)	4.80 (1.87)	4.72 (2.19)
5. Economic Constraints	4.34 (1.84)	3.87 (2.02)	3.94 (1.05)	2.44 (1.59)
6. Age	2.05 (1.07)	3.09 (1.12)	3.30 (1.05)	3.89 (.95)
7. Gender	1.57 (.50)	1.65 (.49)	1.76 (.43)	1.23 (.43)
8. Political Ideology	4.15 (1.58)	5.21 (1.93)	4.48 (1.84)	5.89 (1.66)
9. Knowledge	31.75 (3.21)	32.09 (3.59)	32.20 (3.69)	33.84 (4.26)

Recall that each participant was asked to respond to eleven items querying how often in the last year he/she had performed each activity. A sum was calculated across all eleven items for each respondent. As can be seen in the first row of Table 2, undergraduate students were the least environmentally active ($M=1273.65$), while staff were the

most environmentally active ($M=1673.90$), $t(198) = 3.69$, $p < .000$. Undergraduates were also less active than faculty ($M=1585.99$), $t(198) = 2.48$, $p < .05$.⁸

As shown in row two of Table 2, in response to the question querying environmental sensitivity (see Appendix Six, page two), graduate students reported agreeing with the statement a little less than "5=slightly agree" ($M=4.91$), while staff reported agreeing just slightly less than "6=moderately" ($M=5.91$) to the statement, $t(197) = 2.37$, $p < .05$.

In response to several items on a seven-point scale assessing one's attitudes toward responsible environmental behaviour, staff reported agreeing approximately midway between "6=moderately" and "7=strongly" ($M=6.60$), while faculty reported agreeing slightly less than that ($M=6.35$), $t(198) = 2.27$, $p < .05$. Undergraduate students ($M=6.36$) also reported agreeing to these items less than staff, $t(198) = 2.55$, $p < .05$. Thus, staff appear to have the most favourable attitudes toward engaging in environmental activism, while undergraduate students and faculty appear to have the least favourable attitudes.

As shown in row four of Table 2, undergraduates were more likely to respond "4=neither agree nor disagree" ($M=4.09$) to the question asking them whether or not they

⁸ The scores on this variable ranged from 217.70 to 3844.30.

agree that they have somehow been personally harmed by an environmental problem. However, staff reported agreeing a little less than "5=slightly" to this item, which was significantly greater than undergraduates, $t(198) = 2.13$, $p < .05$. Thus, staff were more likely than undergraduate students to believe that as a result of an environmental problem, they had suffered some personal harm.

Recall that respondents were also asked to indicate on a seven-point scale the extent to which economic constraints prevented them from supporting environmental organizations. As can be seen in row five of Table 2, faculty were the least likely to believe that economic constraints hindered their support of such organizations. Faculty responded to this item by indicating that this interfered almost midway between "2=to almost no extent" and "3=to a slight extent" ($M=2.44$), whereas undergraduates believed this to prevent their support of such organizations a little more than "4=to a moderate extent" ($M=4.34$), $t(198) = 5.45$, $p < .000$. Similarly, graduate students believed that economic constraints interfered a little less than "4=to a moderate extent" ($M=3.87$), also significantly more than faculty, $t(198) = 3.07$, $p < .01$. As well, staff responded that fiscal constraints interfered slightly less than "4=to a moderate extent" ($M=3.94$), again significantly more than faculty, $t(198) = 4.17$, $p < .000$.

Not surprisingly, the four groups of the sample were also found to differ in age. Recall that age was grouped into several categories: 1 = 20 and under, 2 = 21 to 30, 3 = 31 to 40, 4 = 41 to 50, 5 = 51 to 60, and 6 = over 60. As expected, undergraduate students were the youngest group ($M=2.05$), and faculty were the oldest group ($M=3.89$), $t(197) = 8.84$, $p < .000$. Undergraduates were also younger than graduate students ($M=3.09$), $t(197) = 4.14$, $p < .000$, as well as staff ($M=3.30$), $t(197) = 6.99$, $p < .000$. Similarly, graduate students ($M=3.09$) were younger than faculty ($M=3.89$), $t(197) = 2.92$, $p < .01$. Lastly, staff ($M=3.30$) were also younger than faculty ($M=3.89$), $t(197) = 2.78$, $p < .01$.

The groups also differed by gender (1 = male, 2 = female). There were more female staff members ($M=1.76$) than there were female undergraduate students ($M=1.57$) in the sample, $t(198) = 2.55$, $p < .05$. Similarly, there were more women in the staff subgroup than there were in the faculty subgroup ($M=1.23$), $t(198) = 5.70$, $p < .000$. As well, there were more women in the graduate student subgroup ($M=1.65$) than there were in the faculty subgroup ($M=1.23$), $t(198) = 3.4$, $p < .001$. Lastly, there were more women in the undergraduate subgroup ($M=1.57$) than there were in the faculty subgroup ($M=1.23$), $t(198) = 3.68$, $p < .000$.

As can be seen in row eight of Table 2, the four subgroups also differed with respect to political ideology.

Respondents were asked to indicate on a seven-point scale how liberal or conservative they considered themselves to be.⁹ Undergraduates were most likely to indicate that they were "4=middle-of-the-road" ($M=4.15$), whereas faculty were most likely to indicate that they were close to being "6=somewhat liberal" ($M=5.89$), $t(190) = 4.80$, $p < .000$. Undergraduates were also found to be less liberal than graduate students, who were most likely to indicate that they were "5=slightly liberal" ($M=5.21$), $t(190) = 2.59$, $p < .01$. Staff reported being either "4= middle-of-the-road" or "5=only moderately liberal" ($M=4.48$), also significantly less liberal than faculty ($M=5.89$), $t(190) = 3.84$, $p < .000$.

Lastly, the groups also differed on their level of knowledge about environmental issues and problems. Participants were asked to indicate whether or not a number of statements about environmental issues were true or not, on a five-point scale ranging from "1=definitely false" to "5=definitely true".¹⁰ A sum was then calculated for each

⁹ Eighteen respondents (9%) answered "8=other" to this item. Fourteen of these participants indicated that they were "left" of very liberal (i.e., the "7" on the seven-point scale), and therefore these responses were included in the analysis. The other four respondents, who indicated that their political ideology was something other than left of "very liberal", were excluded from the analysis.

¹⁰ It should be noted that participants were also asked whether or not they had ever taken a course on conservation, ecology, and/or environmental concerns, in order to assess whether or not a bias existed. A t-test revealed no significant difference in environmental

individual across all items.¹¹ Undergraduates and staff appear to be the least knowledgeable about environmental issues, while faculty seem to be the most knowledgeable. As shown in row nine, undergraduate students ($M=31.75$) scored lower than faculty ($M=33.84$), $t(197) = 2.91$, $p < .01$. As well, staff ($M=32.20$) also scored lower than faculty ($M=33.84$), $t(197) = 2.21$, $p < .05$.

Therefore, as mentioned previously, several differences between students, staff, and faculty were discovered. However, as explained earlier, differences were anticipated, given the heterogeneity of the sample. The subsequent analyses were conducted on the entire sample, because the results will be generalized back to the university as a whole. However, before conducting further analyses, en route to the development of a path model, several preliminary steps were required.

One of these preliminary steps was the calculation of total involvement in various environmental action activities. It should be evident that differing levels of commitment are associated with the environmental action activities included in the questionnaire (see Appendix 5). For example, it requires less commitment to engage in an

knowledge between those participants who had taken a course, and those who had not $t(199) = .53$ (ns).

¹¹ The sums calculated across the nine knowledge items could range from 9 to 45. The actual range in scores was discovered to be 23 to 41.

informal discussion in order to encourage someone to become more supportive of protecting the environment (#1, under "Environmental Action Activities"), than it does to alter driving habits in an effort to help improve the quality of the environment (#6). In order to help control for these differences, 15 people were surveyed and asked to indicate the level of commitment involved in engaging in each of the activities, on a scale from 1 to 10.¹² Weighted means were then calculated for each of the environmental action activities by multiplying the mean for the unweighted activity by the mean level of commitment calculated for that activity. Since I was interested in an individual's overall level of participation in pro-environmental activities, I then summed across all weighted environmental action activities.

In addition, a sum was also calculated for the items in the "Knowledge of Environmental Issues" section. Again, this computation was conducted because I was concerned with an individual's overall knowledge level, with respect to environmental issues and concerns.

Recall that the questionnaire used in the present study contained several sections, with different scales. Thus, the next step was the computation of composite indices for

¹² The means for the level of commitment associated with each of the eleven activities (see Appendix 5, page 1) ranged from 2.7 (for recycling) to 6.8 (for donating money and/or time to an environmental organization).

these scales. Subsequent to this, Cronbach's alphas were calculated to ensure the reliability of the scales. Cronbach's alpha is a statistic that summarizes the reliability of index by calculating the average intercorrelations among items in a scale (Bohrnstedt & Knoke, 1982). Thus, composite indices were calculated for attitudes (Cronbach's alpha = .78), tactical efficacy (Cronbach's alpha = .85), and knowledge of action strategies (Cronbach's alpha = .84). Because the Cronbach's alpha for the two items assessing environmental sensitivity was low (.53), only one item was used for inclusion in the further analyses (i.e., the question assessing the participant's current involvement in outdoor activities). The Cronbach's alpha for collective control was also found to be low (.47) and again only one of the two items assessing this variable was used for inclusion in subsequent analyses (i.e., the question assessing an individual's general belief that collective efforts made by people can be efficacious in improving environmental quality).

Situational variables that may prevent an individual from becoming more environmentally active was another scale included in the questionnaire. However, a composite index was not calculated for these items after discovering that the Cronbach's alpha was low (.47). Therefore, a rotated varimax factor analysis was conducted to determine if the items clustered into specific factors. This analysis

revealed two factors, one included time commitments to family and friends, other organizations, and to career/school. The other factor included recycling on campus as contingent upon the availability of convenient recycling containers, as well as the availability of community support for becoming more environmentally active. Composite indices were calculated for these two factors and the Cronbach's alphas were found to be .71 and .65, respectively. Thus, all scales demonstrated good internal consistency.

The last preliminary step before proceeding to the development of a model of responsible environmental behaviour, was to standardize all variables, as is dictated in full-scale path analysis (Pedhazur, 1982). Thus all preliminary steps were completed, and the analyses required for the development of a path model were conducted.

Prior to the development of a path model, a simultaneous multiple regression was conducted on the Hines (1984) model (excluding the variables "efficacy perception" and "locus of control", which were not assessed by the measure used in the present study) and on the revised version of that model (see Figure 2). This was conducted in order to determine which model best predicted responsible environmental behaviour. Inspection of the R^2 for each of these regressions revealed that the original Hines model explained 32% of the variance in the dependent variable

(responsible environmental behaviour), while the revised version of her model explained 43% of the variance in the dependent variable. Thus, it appears that the revised version of the Hines model, is somewhat more successful in predicting responsible environmental behaviour than the original model.

However, because not all of the variables included in the original model were included in this analysis, it is not possible to determine whether or not this difference is accurate. Nevertheless, the revised version of the model does explain a significant amount of the variance in the dependent variable. As well, the present study was undertaken not only to determine if the variables included in the revised version of Hines (1984) model were crucial in predicting responsible environmental behaviour, but also to determine the relationships that exist among these variables. Therefore, it is reasonable to continue with the analyses and develop a more elaborate path model from the revised version of Hines' model.

The first step in the development of a model was to identify key explanatory constructs and to develop preliminary ideas regarding variable ordering. Multiple regression is a statistical technique which allows the determination of which variables are most significant in explaining the variance in scores on the dependent variable (Bohrnstedt & Knoke, 1982). In the present study, the

dependent variable would be involvement in various environmental action activities. Thus, a series of simultaneous multiple regression analyses were conducted, beginning with the regression of "responsible environmental behaviour" on all 17 predictor variables.¹³ Three variables contributed significantly ($p < .05$) to the regression equation ("age", "worry", and "knowledge of issues"), and two variables approached significance ($p < .10$) in contributing to the regression equation ("personal responsibility" and "knowledge of action strategies").

Subsequent regression analyses were conducted on four of these five predictor variables (age was excluded)¹⁴, again entering all 17 variables simultaneously. This was done in order to understand better variable-ordering in the subsequent development of a path model. That is, although key variables were identified in the first regression as predicting "responsible environmental behaviour", determination of which variables predict those key variables was still needed, if a comprehensive model was to be developed. After inspecting the results of these analyses,

¹³ Due to the large number of variables, and a comparatively small sample size, several demographic variables were excluded from subsequent analyses. The variables that were excluded were level of education, level of income, and whether or not the respondent had children.

¹⁴ As is intuitively obvious, age cannot be considered a dependent variable in a regression equation because the independent variables entered into the equation cannot logically predict an individual's age.

all five regressions were repeated, simultaneously entering only those variables which were statistically significant ($p < .05$) or approached significance ($p < .10$). The results of these final regressions are presented in Table 3.

TABLE 3: KEY EXPLANATORY VARIABLES FROM REGRESSION ANALYSES

Measure	Beta	t	r
Responsible Environmental Behaviour Regression ($R^2=.40$)			
Worry	.31	4.947***	.48
Knowledge of Action Strategies	.28	4.549***	.37
Personal Responsibility	.20	3.130**	.44
Age	.18	3.025**	.24
Knowledge of Issues	-.16	-2.828**	-.05 (ns)
Knowledge of Issues Regression ($R^2=.09$)			
Knowledge of Action Strategies	.25	3.413***	.19
Age	.20	2.927**	.17
Responsible Env'tal Behaviour	-.19	-2.530*	-.05 (ns)
Worry Regression ($R^2=.31$)			
Responsible Env'tal Behaviour	.35	5.454***	.48
Attitudes/Intention to Act	.32	4.937***	.46
Knowledge of Action Strategies Regression ($R^2=.59$)			
Perception of Skill	.59	10.440***	.71
Social Support	.21	4.197***	.37
Knowledge of Issues	.12	2.622**	.19
Tactical Efficacy	.09	1.795 ($p<.10$)	.40
Responsible Env'tal Behaviour	.06	1.201 ($p<.10$)	.37
Responsibility Regression ($R^2=.46$)			
Attitudes/Intention to Act	.28	4.073***	.55
Collective Control	.18	2.865**	.39
Responsible Env'tal Behaviour	.19	3.032**	.44
Personal Harm	.15	2.562*	.32

* $p < .05$ ** $p < .01$ *** $p < .001$

As can be seen in the first section of Table 3, 40% of the variance in "responsible environmental behaviour" was explained by the combination of "worry", "knowledge of action strategies", "personal responsibility", "age", and "knowledge of issues". As shown in the second section of Table 3, when "knowledge of issues" was used as the dependent variable, "knowledge of action strategies", "age", and "responsible environmental behaviour" all entered as significant predictor variables, however only 9% of the variance was accounted for. Inspection of the standardized beta coefficients reveals that "knowledge of issues" is positively related to "knowledge of action strategies" and "age", but is, surprisingly, negatively related to "responsible environmental behaviour". As can be seen in the third section of the table, "worry" was significantly predicted by "responsible environmental behaviour" and "attitudes/intention to act". The fourth section of Table 3 reveals that "knowledge of action strategies" was significantly predicted by "perception of skill", "social support", and "knowledge of issues". Both "tactical efficacy" and "responsible environmental behaviour" were non-significant. However, "tactical efficacy" did approach significance in its contribution to the regression equation; "responsible environmental behaviour" did not. Lastly, as shown in the last section of the table, "attitudes/intention to act", "collective control", "responsible environmental

behaviour", and "personal harm" all significantly predicted "personal responsibility". Three variables, "tactical efficacy", "perception of skill", and "political ideology" were non-significant in their prediction of "personal responsibility". The zero-order correlations among the 12 key explanatory variables are presented in Table 4.

TABLE 4: CORRELATIONS BETWEEN KEY EXPLANATORY VARIABLES

Measure	1	2	3	4	5	6	7	8	9	10	11	12
1. Resp. Evt. Behaviour	--	.47	.37	.44	.23	-.05	.39	.39	.31	.19	.23	.26
2. Worry	--	--	.25	.39	.22	.08	.46	.25	.19	.19	.20	.16
3. Knowledge of A.S.	--	--	--	.31	.05	.19	.33	.71	.37	.40	.05	.25
4. Personal Resp.	--	--	--	--	.13	.06	.55	.39	.25	.41	.32	.39
5. Age	--	--	--	--	--	.17	.26	.04	.09	.03	.24	.01
6. Knowledge of Issues	--	--	--	--	--	--	.12	.09	.11	.05	.01	.01
7. Attitudes	--	--	--	--	--	--	--	.39	.24	.50	.34	.32
8. Perception of skill	--	--	--	--	--	--	--	--	.21	.48	.13	.28
9. Social Support	--	--	--	--	--	--	--	--	--	.05	.14	.23
10. Tactical Efficacy	--	--	--	--	--	--	--	--	--	--	.18	.42
11. Personal Harm	--	--	--	--	--	--	--	--	--	--	--	.03
12. Collective Control	--	--	--	--	--	--	--	--	--	--	--	--

Note: $r > .12, p < .05;$
 $r > .14, p < .01;$
 $r > .20, p < .001$

In order to more fully understand the relationships between the key explanatory variables, all possible zero-order partial correlations between "responsible environmental behaviour" and each of the 11 predictor variables were calculated. Partial correlations allow the calculation of correlations between variables, while controlling for variables that may be confounding the relationships. Thus, although many of the variables have high correlations, as shown in Table 4, several of these relationships may be attenuated by controlling for other variables. The 110 resulting partial correlations are presented in Table 5. The combination of regression analyses, zero-order correlations, and partial correlations conducted help to illuminate the relationships that exist among the key explanatory variables.

What is noteworthy about Table 5 is the number of correlations that remain significant, even when other variables are being controlled for. As can be seen from Table 4, only one of the 11 key explanatory variables ("knowledge of issues") is not significantly correlated with "responsible environmental behaviour". If the correlation between "responsible environmental behaviour" and "knowledge of issues" is excluded from Table 5, 93% of the correlations still remain significant at the $p < .05$ level. Thus, the correlations from both Tables 4 and 5 reveal that all of the

variables are quite interrelated. This is an important finding and should be kept in mind when examining the remaining analyses.

TABLE 5: ZERO-ORDER PARTIAL CORRELATIONS WITH RESPONSIBLE ENVIRONMENTAL BEHAVIOUR

Measure	Variable Controlled										
	1	2	3	4	5	6	7	8	9	10	11
1. Worry	--	.43	.38	.45	.49	.36	.41	.44	.45	.45	.45
2. Knowledge of A.S.	.33	--	.30	.40	.42	.31	.14	.30	.33	.37	.34
3. Personal Resp.	.30	.34	--	.41	.44	.25	.32	.39	.39	.39	.37
4. Age	.18	.27	.22	--	.27	.18	.24	.23	.24	.20	.25
5. Knowledge of Issues	-.10	-.12	-.08	-.09	--	-.09	-.07	-.09	-.06	-.05	-.05
6. Attitudes	.24	.31	.21	.36	.40	--	.28	.35	.35	.35	.34
7. Perception of Skill	.34	.20	.27	.41	.41	.29	--	.36	.35	.38	.35
8. Social Support	.24	.16	.22	.28	.30	.24	.25	--	.31	.29	.27
9. Tactical Efficacy	.15	.08	.08	.22	.23	.02	.01	.19	--	.17	.11
10. Personal Harm	.17	.24	.11	.19	.24	.12	.19	.19	.20	--	.23
11. Collective Control	.21	.16	.11	.26	.26	.16	.17	.20	.20	.26	--

Note: $r > .12, p < .05;$
 $r > .16, p < .01;$
 $r > .23, p < .001$

Nevertheless, quite a number of correlations do become quite attenuated (a decrease of $\geq .15$ in the correlation)¹⁵ when certain variables are controlled for. For example, the correlation between "social support" and "responsible environmental behaviour" appears to be mediated by "knowledge of action strategies". That is, the correlation between "social support" and "responsible environmental behaviour" decreased from .31 to .16 when "knowledge of action strategies" was controlled for. "Tactical efficacy" appears to be mediated by both "attitudes/intention to act" and "perception of skill". The correlation between "tactical efficacy" and "responsible environmental behaviour" decreased from .19 to .02 when "attitudes/intention to act" was controlled, and to .01 when "perception of skill" was controlled. Lastly, "collective control" appears to be mediated by "personal responsibility", because the correlation between "collective control" and "responsible environmental behaviour" decreased

¹⁵ This figure ($\geq .15$) was chosen because in combination with the preceding regression analyses it seemed to be the most logical. That is, from the preceding regression analyses I had reached some preliminary ideas about variable ordering. The zero-order correlations and partial correlations were conducted to confirm or disprove these preliminary ideas. Using a figure of less than .15 led to greater confusion about variable ordering. Likewise, after examining the regression analyses, using a cut-off point of at least .20 would also have created confusion in determining variable ordering. For these reasons, then, a decrease of $\geq .15$ was considered sufficient to indicate attenuation.

from .26 to .11 when "personal responsibility" was controlled.

Several other relationships appear less clear, however. For example, "perception of skill" and "knowledge of action strategies", appear to mediate each other in their relationships with "responsible environmental behaviour". That is, the correlation between each of these variables and "responsible environmental behaviour" decreases by at least .15 when each is controlled for. This also appears to be true for the relationship between "attitudes/intention to act" and "personal responsibility".

However, recall that "personal responsibility" approached significance in contributing to the regression equation when "responsible environmental behaviour" was the dependent variable. This was not the case for "attitudes/intention to act". For this reason, therefore, "personal responsibility" was thought to depend upon one's "attitudes/intention to act" instead of the reverse.

In addition, recall also that "knowledge of action strategies" approached significance in the "responsible environmental behaviour" regression, whereas "perception of skill" did not. Thus, "knowledge of action strategies", not "perception of skill" was felt to directly precede "responsible environmental behaviour" in the model subsequently developed.

Moreover, the relationship between "perception of skill" and "knowledge of action strategies" was felt to be correlational instead of causal. As mentioned previously, the partial correlations conducted revealed that the correlations between both of these variables and "responsible environmental behaviour" were both attenuated when each variable was controlled for in the correlation. However, intuitively it did not make sense that "knowledge of action strategies" was dependent upon an individual's "perception of skill" in employing those action strategies. Thus, it is hypothesized that these two variables probably occur simultaneously.

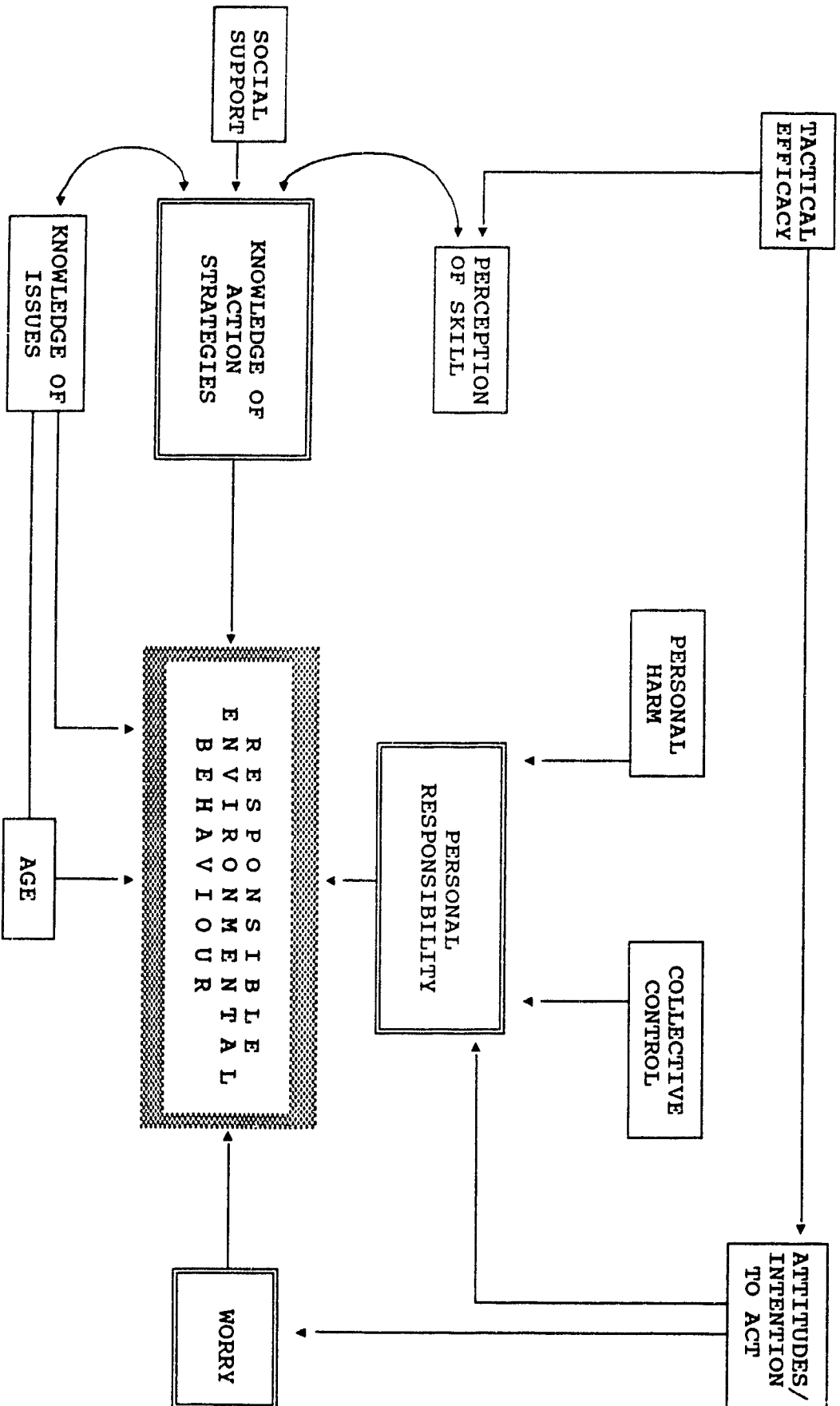
As well, the relationship between "knowledge of issues" and "knowledge of action strategies" also was difficult to discern. The partial correlations conducted revealed that these two variables do not appear to be mediated by each other. However, each of these variables contributed significantly to the regression equations when each variable was considered the dependent variable (see Table 3). In addition, these two variables were found to be significantly correlated ($r = .19$, $p < .05$). Thus, the relationship between these two variables is as yet unclear, and causation will not be inferred in the model developed.

Hence, all variables appear to be highly interrelated, and some relationships between variables seem difficult to decipher. Nonetheless, based upon the preceding analyses, a

path model was constructed incorporating all 11 key explanatory variables (see Figure 3). As shown in Figure 3 the five variables which contributed significantly to the "responsible environmental behaviour" equation are shown to directly contribute to "responsible environmental behaviour" in the model. Then, based upon the subsequent regression analyses and partial correlations calculated, variables thought to contribute to each of these five variables were added to the model. Thus, "worry" is shown to be dependent upon one's "attitudes/intention to act". "Personal responsibility" is predicted to be dependent upon "attitudes/intention to act", "collective control", and "personal harm". "Knowledge of action strategies" is shown to be dependent upon "social support", and to be correlated with both "perception of skill" and "knowledge of issues". "Knowledge of issues" is predicted to be dependent on "age". As well, "attitudes/intention to act" is shown to be dependent upon "tactical efficacy".

As seen in Figure 3 and mentioned above, "personal responsibility" is shown to be dependent upon "personal harm". As shown in Table 5, the correlation between "personal harm" and "responsible environmental behaviour" was not attenuated by $\geq .15$, when "personal responsibility" was controlled. However, the correlation did decrease from .23 to .11, and "personal harm" did contribute significantly to the regression equation when "personal responsibility"

FIGURE 3 : MODEL OF RESPONSIBLE ENVIRONMENTAL BEHAVIOUR

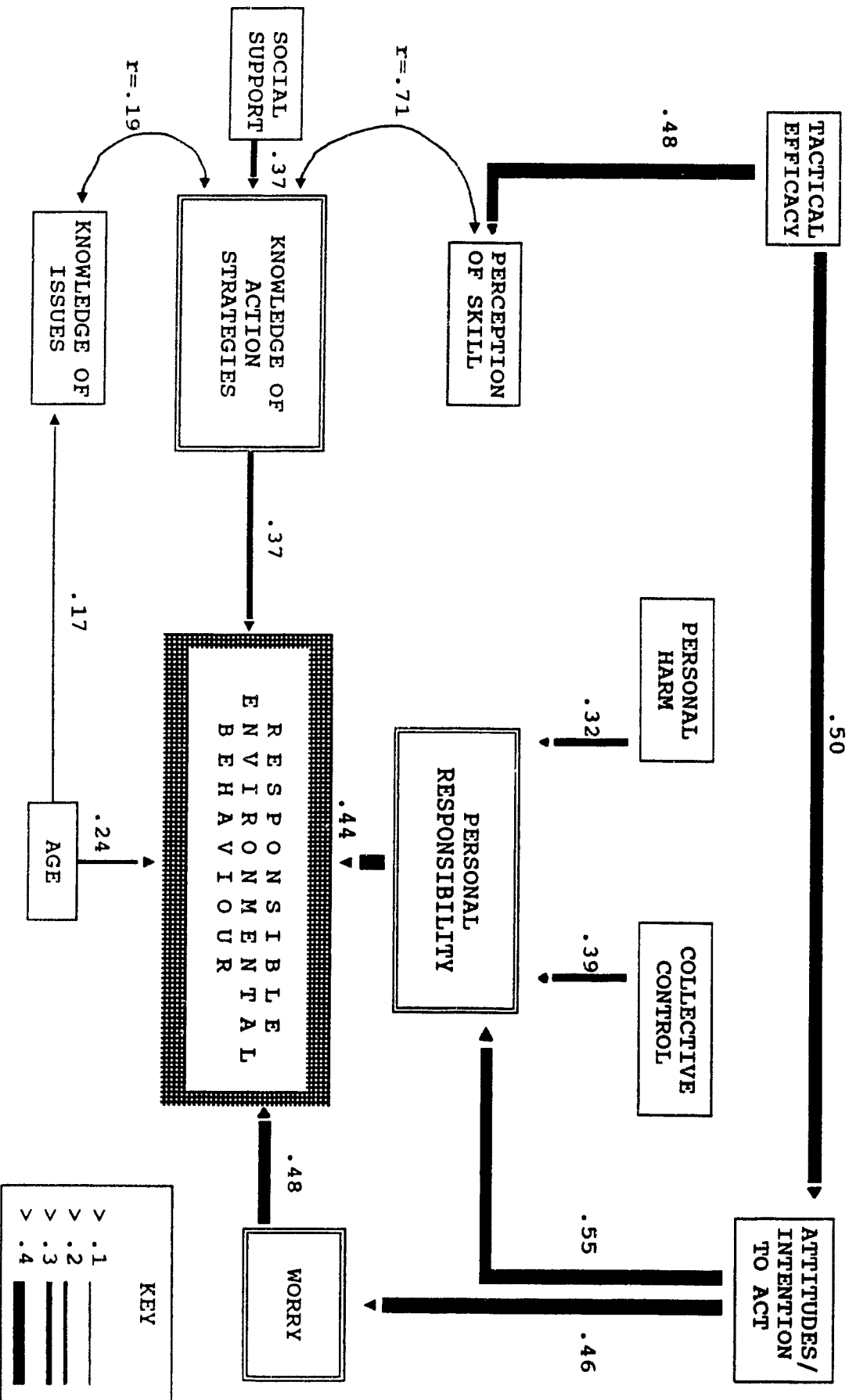


was the dependent variable (see Table 3). For these reasons, "personal harm" was included in the model.

In order to determine the strengths of the paths predicted, each endogenous variable in the model (i.e., those variables which are 'nested' in the model, and have variables with paths leading to them) was regressed on all causally prior variables, and standardized beta coefficients were examined. In order to control for practical as well as statistical significance, all path estimates of .10 or less were excluded from the model (Hamilton, Keilin, Knox, & Naginey, 1989; Davis, 1985).

Thus, Figure 4 shows the path coefficients associated with each of the paths in the model. As predicted, four of the five variables thought to contribute significantly do in fact have strong paths. Interestingly, the path between "knowledge of issues" and "responsible environmental behaviour" was excluded from the model because it failed to meet the criterion for inclusion of .10 or greater. Other than that path, all other paths were found to be significant, as shown in the model in Figure 4.

FIGURE 4: PATH MODEL OF RESPONSIBLE ENVIRONMENTAL BEHAVIOUR WITH COEFFICIENTS



Discussion

The preceding analyses led to a preliminary path model which predicts responsible environmental behaviour (Figure 4). Examination of the model reveals which variables directly contribute to the prediction of environmental activism (heretofore referred to as primary variables). The primary variables include, how often an individual worries about environmental deterioration ("worry"), how personally responsible he/she feels for improving the quality of the environment ("personal responsibility"), an individual's perception of his/her level of knowledge about action strategies ("knowledge of action strategies"), and the age of the individual ("age").

Several other variables appear to be secondary in importance, in that they are mediated in their relationships with responsible environmental behaviour, through one of the primary variables. These secondary variables include one's attitudes toward, or intention to engage in, responsible environmental behaviour ("attitudes/intention to act"), the perceived efficacy of pro-environmental tactics in improving the quality of the environment ("tactical efficacy"), perceptions of personal harm suffered from poor environmental quality ("personal harm"), the perceived efficacy of collective action in helping to improve environmental quality ("collective control"), perceived level of skill associated with employing the pro-

environmental action strategies ("perception of skill"), and whether or not the individual had family, friends, and/or acquaintances involved in environmental issues ("social support").

Knowledge of environmental issues appears only to be associated with responsible environmental behaviour, through its relationship with an individual's knowledge of action strategies. Thus, it appears that knowledge of environmental issues is not a crucial determinant of environmental activism. This finding, however, could be peculiar to the sample used in the present study. The respondents in this study were highly educated, moderately informed, and somewhat environmentally active.¹⁶ Hence, this result cannot be generalized to the general public. Nevertheless, this discovery is intriguing and lends support to Borden and Schettino's (1979) hypothesis that knowledge of environmental issues need not precede involvement in pro-environmental behaviours.

However, perhaps a distinction should be made between knowledge of environmental facts and knowledge of environmental deterioration as an important public issue. In my study, as well as Borden and Schettino's (1979), "knowledge of environmental issues" was assessed by questioning respondents about specific environmental problems. This operational definition could be misleading.

¹⁶ For more details see Appendix Seven.

Conceivably, the reason for the failure to demonstrate "knowledge of environmental issues" as a precursor to "responsible environmental behaviour" is that we have operationalized this variable in a very limited manner. Perhaps knowledge of ecological and environmental facts is not necessary for becoming environmentally active, but an awareness of environmental degradation is.

The results from the present study seemed to indicate that the participants were aware of environmental degradation as a public issue, as indicated by how often they worry about this problem. Recall that "worry" was very strongly associated with engaging in environmental activism. However, the participants' knowledge of specific environmental and ecological facts, although moderate, was not directly related to responsible environmental behaviour. Thus, it is likely that Borden and Schettino (1979) were correct -- knowledge of ecological and environmental facts does not necessarily have to precede involvement in environmental activism. However, knowledge of environmental problems as a public issue probably does have to precede this type of activism. Therefore, it is important for researchers to make a clear distinction between these two issues when operationalizing the variables in their investigations.

In addition, as mentioned previously, age was discovered to be a primary variable in the model. That is,

the present study established that the older a respondent was, the more likely it was that he/she was environmentally active. This conclusion appears to be in contrast to Van Liere and Dunlap (1980) who found that environmentally concerned individuals usually were young. There could be several reasons for this apparent contradiction.

First, Van Liere and Dunlap (1980) measured concern not behaviour, and quite conceivably concern for the environment may not always translate into environmental activism. Secondly, since 1980, environmental issues, concerns and problems have been greatly publicized and thus a wide audience has been reached. To expand on this point, perhaps the extent of this publicity has introduced a mediating factor in the relationship between age and responsible environmental behaviour. It may be that whether or not an individual has children moderates this relationship. In the present study, older respondents, who are more likely to have children than younger respondents, could be more environmentally active because of their concern for the future of their children. Unfortunately, because of the large number of variables, and the relatively small sample size, this variable was not included in the analysis. Lastly, approximately two-thirds (68.2%) of the present sample were under the age of 40 -- far from being "old", thus there may not be a contradiction with Van Liere and Dunlap.

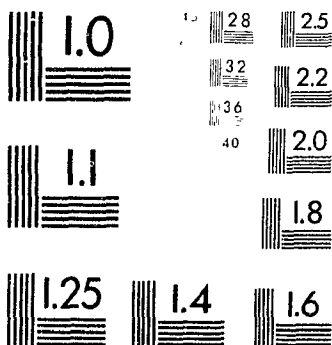
Recall that the present study was designed to test whether the list of variables presented earlier (see Figure 2), most of which were proposed by Hines (1984) (see Figure 1), predict responsible environmental behaviour. Examination of this list and the subsequent path model that was developed reveals that most of the variables from Figure 2 either directly or indirectly predicted responsible environmental behaviour. As well, the revised version of the model was discovered to account for 43% of the variance in "responsible environmental behaviour", while the original Hines model accounted for 32% of the variance in the dependent variable.

Nonetheless, several variables appear to be unimportant in the prediction of environmental activism. These variables include "environmental sensitivity", "gender", "political ideology", and several situational factors, including "time constraints", "economic constraints", and "community support". The lack of a relationship between situational constraints and responsible environmental behaviour is somewhat encouraging. That is, time and economic constraints, as well as lack of community support seem not to interfere with one's involvement in pro-environmental activities. The failure to discover a relationship between political ideology and responsible environmental behaviour, as well as gender and responsible environmental behaviour is also promising. This finding

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could indicate that environmental activism is not limited to specific political ideologies (e.g., more "liberal" individuals) or to one gender. Nonetheless, it should not be overlooked that these conclusions may not be relevant to populations other than students, staff and faculty at WLU.

Although this study appears to be successful in identifying crucial variables predicting environmental activism, a caveat is necessary. The primary variables in the present study account for 40% of the variance in "responsible environmental behaviour". Thus, although many of the variables shown in Figure 2 are significant, it is apparent that several variables, important in explaining this type of behaviour, have not been identified by the present study.

Hines (1984) also hypothesized that "intention to act" would lead directly to engaging in responsible environmental behaviour. In the present study, however, this hypothesis was not supported. The preceding analyses discovered that "intention to act" was mediated by both "personal responsibility" and "worry" in its relationship with behaviour. This could be a function of differing operational definitions. Unfortunately, however, Hines did not provide enough detail in her study to be certain.

As well, Hines (1984) also predicted that situational factors would impinge directly upon behaviour. Again, this hypothesis was not supported. The only situational factor

found to be important in the present study was "social support", and this variable was found to be mediated by "knowledge of action strategies" in its relationship to responsible environmental behaviour.

Thus, the revisions I proposed to Hines (1984) model appear to be moderately successful in predicting involvement in pro-environmental activities. Recall that I hypothesized that several variables not included in Hines' original model could be important predictors of this type of behaviour. These revisions involved the inclusion of "worry" and "tactical efficacy" to the list of variables influencing one's "intention to act". In addition, "locus of control" was excluded and replaced by perceptions of "collective control", as one of the personality factors believed to influence the "intention to act". Perceptions of "personal harm" and "environmental sensitivity" were included as subsets of attitudes that I hypothesized to be important to the model. Several demographic variables were added to the original Hines model to assess their importance as well. Lastly, "social support" was included with "situational factors" because I speculated that this variable could be associated with involvement in environmental activism.

Excluding one's age, the demographic variables appeared to be unrelated to one's involvement in responsible environmental behaviour. Also, as mentioned previously,

"environmental sensitivity" and several situational constraints were found to be unrelated to this type of behaviour. However, "worry", "tactical efficacy", "personal harm", "collective control" and "social support" were discovered to predict one's involvement in pro-environmental behaviours. In addition, as explained previously, the revised version of the Hines (1984) model was more successful than the original version in explaining the variance in "responsible environmental behaviour". Based upon these findings, it appears that the revisions I had proposed were important to the original Hines (1984) model, are relevant.

Thus, the hypothesis that the variables presented in Figure 2 are important predictors of responsible environmental behaviour was largely supported. Illumination of these variables has some important implications for environmental activists and educators, as well as for the WLU community.

The goal of environmental education has been identified as

...to create pro-environmental behavior by producing a citizenry that is knowledgeable concerning the biophysical environment and its associated problems, aware and skilled in how to become involved in helping to solve these problems, and motivated to work toward their

solution (Larson, Forrest, & Bostion, 1981, p. 21).

Identification of the primary variables in the model provides educators and activists with important information about which variables to concentrate on in their efforts to produce such a citizenry. For example, at least with a somewhat educated and informed audience, efforts should focus on increasing individuals' knowledge of action strategies, their sense of personal responsibility for improving environmental quality, and how often he/she worries about environmental deterioration. I will address each of these variables in turn.

Strategies that could be used on an everyday basis to help improve environmental quality should be made very explicit, resulting in an increase in individuals' level of knowledge regarding action strategies. According to the model, this increase should lead to greater involvement in pro-environmental activities. Indeed, research in this area has produced some encouraging results. For example, Jordan et al. (1987) have empirically supported the hypothesis that knowledge of environmental issues alone is less effective than a combination of knowledge of environmental issues and action strategies in producing behavioural change.

An important step in this direction would be to keep the public informed and aware of alternatives to household cleaners which pollute or about how to reduce household

waste. As well, strategies that could help improve environmental quality that are not "everyday" should also be made explicit. For instance, residents should be kept aware of which companies are polluting in their community and about how to confront such an issue, as well as which politicians they should raise such concerns with. Perhaps environmental activists could also keep the public updated about clean-up projects occurring in their neighbourhoods, tree-planting, etc.

Increasing "personal responsibility" could be achieved by activists and educators continuing to inform their intended audience about the detrimental effects and implications of the "everyday" actions that they engage in. For example, the polluting effects of store-bought chemical household cleaners could be made more explicit to consumers, making it clear that environmental quality is as much a personal responsibility as it is a governmental or industrial one. Alternatives to such cleaners, as discussed above, should be made explicit and encouraged.

Increasing how often an individual worries about environmental destruction could be achieved by continuing to keep environmental issues salient to the general public. It appears this has already been quite successful. Indeed, in the present sample, 86.9% of the respondents worried at least once or twice a month about the threat of environmental deterioration. Environmental activists and

educators should persist in their efforts to keep environmental concerns conspicuous by continuing to publicize actual and potential environmental problems and disasters.

However, since media attention to different issues can vacillate depending on what is most attention-getting, it is quite conceivable that coverage of environmental issues could wane in the coming years. Activists and educators, therefore, will have to prepare for this event by trying to promote greater consistency between environmental attitudes and responsible environmental behaviour among the general public. Thus, when media attention does wane, individuals will continue to behave in accordance with their environmental attitudes.

Although environmental activists and educators should concentrate their greatest efforts on the primary variables, attention will need to be given to the secondary variables in the model, if a more comprehensive approach to these issues is to be developed. That is, an individual's attitudes, perceptions of tactical efficacy, collective control, personal harm, and skill involved in employing action strategies, will need to be addressed also.

Thus, in their endeavours to address environmental concerns to the general public, individuals working in this area should also incorporate the secondary variables into their agenda. For example, if the public is made aware of

instances where peoples' efforts have proven effective, their perceptions of collective control may increase. This increase in an individual's perception of collective control should influence his/her sense of personal responsibility, a primary variable in the model. As indicated previously, the primary variables are predicted to directly influence responsible environmental behaviour.

In addition, increases in perceptions of tactical efficacy could be achieved by making the public aware of how different tactics and strategies have been efficacious. An example of this strategy would be to make the public aware of how much landfill has been saved as a result of household recycling, and thus demonstrate to the public that curbside recycling has been effective. Although the model predicts no direct relationship between tactical efficacy and responsible environmental behaviour, increasing individuals' perceptions of tactical efficacy should indirectly result in increases in environmental activism.

Similarly, if efforts are made to improve environmental attitudes, as well as increase perceptions of harm suffered from poor environmental quality, levels of environmental activism should be increased. Again, this increase in environmental activism is predicted to occur because each of these variables would be influencing one of the primary variables in the model.

It seems apparent that concurrent with influencing the

variables mentioned above, an individual's level of knowledge about environmental issues and problems should be increased, which should also help to increase the possibility of engaging in responsible environmental behaviour. In addition, people who are already engaging in this type of behaviour should also be encouraged to persuade family, friends and acquaintances to participate, because it appears that individuals who have this kind of social support are more likely to engage in responsible environmental behaviour.

The implications of the present study may be most consequential for the WLU community. As explained earlier, several of the items in the questionnaire assessed attitudes, thoughts and behaviours specific to the university. I have recently presented these results to the university's "3 R's Committee" (Reduce, Reuse, Recycle). This committee was formed by the administration in the Fall of 1989, and I have been a member on that committee since December 1989. Members of this committee include the Associate Vice-President: Personnel/Student Affairs, the Dean of Students, Director of Services: Physical Plant and Planning, the Environmental Coordinator, the President of the Student Union, the Director of Services: Health and Safety, Dr. Douglas McKenzie-Mohr of the Department of Psychology, as well as several students interested in environmental issues.

The 3 R's Committee has been largely concerned with the initiation of the fine-paper recycling program on campus, which took almost one year to plan and begin operation. However, the committee meetings have also been an opportunity to discuss what other environmental efforts can be started on campus. My involvement with the committee began because of my interest in these issues and that I had hoped my thesis results could provide the committee with some direction in which to proceed with further environmental activities on campus.

My fifteen-minute presentation to this committee included the results indicating the extremely high level of support among students, staff and faculty at WLU for further environmental initiatives on campus. For example, virtually all of the sample (99.5%) believed that students, staff and faculty at WLU should recycle as much as possible. Secondly, close to 97% of the sample (96.6%) agreed, at least slightly, that the university should try to reduce the amount of paper used or produced. As well, practically all of the sample (99.5%) believed that students, staff, and faculty should try to purchase paper products made from recycled paper fibre as much as possible. Furthermore, 78.3% of the students, staff, and faculty surveyed replied that they would be at least "somewhat likely" to attend periodic seminars on environmental issues if they were

offered by the university.¹⁷

Respondents were also given the opportunity to suggest ways in which WLU could improve its environmental profile. Many took this opportunity to recommend several good ideas, and these results were also presented to the committee. Suggestions were quite diverse, but many clustered around several themes. For example, fifty-four respondents suggested that the university step-up awareness about environmental issues around campus; 117 respondents recommended further or improved recycling initiatives on campus, including increasing the number of bins around campus for deposit of recyclables; 31 respondents advised that styrofoam and plastic containers/utensils in the dining areas should be discouraged or eliminated; and 25 participants suggested that paper use should be reduced on campus. Many other useful suggestions were made, and readers are directed to Appendix 8 for further information.

The findings specific to WLU, the path model I developed identifying the crucial variables related to environmental activism, as well as my conclusions regarding these results were presented to the 3 R's Committee recently. I recommended to the committee that the variables I identified as being directly related to this type of behaviour be considered when promoting environmental

¹⁷ For further information on the results of findings specific to Wilfrid Laurier University, see Appendix 8.

activities on campus. I also recommended directions for further activities initiated by the committee: informing the university community about how to reduce paper usage, offering seminars on environmental issues to students, staff, and faculty, increasing recycling efforts on campus, purchasing more paper products from recycled paper, and making this kind of paper available in the bookstore.

My presentation appeared to have been well received. The Student Union President would like me to publish the results in the student newspaper, and hopefully this will be occurring soon. As well, the Dean of Students recommended that I present the results to the Staff and Faculty Associations, and he will be contacting me about this. Perhaps one way of doing this would be to publish the results in the staff and faculty newsletter, "The Laureate". In addition, the Environmental Coordinator recommended that I contact the environmentalist group on campus and inform them about my results. Because of time limitations, I did not have the opportunity to discuss the differences I found between students, staff and faculty on several of the variables in the model (see Table 2). Nevertheless, these differences could be important (especially the differences on variables included in the final path model), and this issue will be raised in subsequent meetings. Lastly, I hope to be involved in developing guidelines for reducing paper usage for the Department of Psychology at WLU.

Consequently, the results from this research could be quite useful and may help expand WLU's environmental agenda. I will continue to be a member of this committee and thus I hope to see some of my recommendations realized. The committee members appear to be quite committed to furthering WLU's environmental initiatives. The most serious impediment to realizing some of the committee's recommendations will be the administration's fiscal restraint.

Hence, it seems that the results of the present study could be far-reaching. Nonetheless, there are several limitations to this research that need to be addressed. The main limitation of the present study is the lack of generalizability of the findings to the general public or to other universities. The sample in this study consisted of students, staff, and faculty at a small and conservative university. As discussed previously, this sample was also quite educated, moderately informed, and somewhat environmentally active (see Appendix 7). Thus, at best, these results could be generalized to other university communities similar to WLU's. However, this too could be problematic, if the communities in which these other universities are located are quite different from Kitchener/Waterloo (e.g., rural or very ethnic).

Secondly, as described previously, the participants who responded to the full survey differed from those who chose

not to in several ways (see Table 1). Thus, there may be a problem in generalizing these findings to the university as a whole. However, the response rate to the full survey is quite high (76.5%) and may help to guard against such bias.

Thirdly, there may be validity problems with the questionnaire utilized in the present study. The items in the questionnaire used were not standardized, thus there are no normative data available for comparative purposes. As well, as occurs in survey research, problems with the construction of several items in the questionnaire become apparent only after administering the survey quite a few times. For example, several details regarding specific environmental problems are still equivocal, which several respondents pointed out to interviewers. Indeed, this problem may have resulted in the lack of a clear relationship between "knowledge of issues" and "responsible environmental behaviour". As well, some participants also complained that there were items in the questionnaire that they found ambiguous and difficult to answer. Perhaps more extensive piloting of the questionnaire would have revealed such problems.

In addition, I followed a traditional approach in designing and administering the questionnaire. That is, I conducted a literature search and used written resources only, excluding other possible sources. For example, perhaps I could have gleaned additional useful information

if I had taken more of a "stakeholder" approach to the design and implementation of my research. Indeed, a collaborative, more participatory approach to conducting community psychology research is advocated by practitioners within this discipline (Walsh, 1987).

A more collaborative approach would have involved consulting with different individuals or groups on campus with a "stake" in research such as that conducted in the present study. That is, I could have consulted with several groups or individuals on campus and received their input as to what pertinent issues they would like to see addressed in the survey. These groups could have included the 3 Rs Committee, the Environmentalist Club, the Student Union President, the Staff Association President, the Faculty Association President, etc. In addition, instead of collecting the data purely in the form of a telephone survey, I could have also conducted qualitative interviews with some of these individuals in these groups. Thus, not only could I have empirically tested the Hines model by telephone survey, but I could have gathered more information relevant to the WLU community. Regrettably, this approach was not taken.

Lastly, as mentioned previously, this study's unit of analysis was the individual. I was interested in understanding what prompts individuals to behave in a manner which is environmentally responsible. I recognize this as

both a bias and a limitation, as was discussed previously. We have been socialized in North America to be consumers--and we have been very good at it. However, environmentalists are making it well-known that this type of behaviour cannot be maintained, if we (humanity as well as other forms of life) are to survive. This type of advocacy is threatening to the status quo. Thus, although our individual behaviours are environmentally destructive, the system seeks to preserve most of those behaviours. Recycling has been embraced and promoted by communities (and by this university) because of its non-threatening nature. The other "2 Rs" (i.e., reducing and reusing) have not been accepted so wholeheartedly. Hence, a limitation of this study is that I did not attempt to address these larger issues, and take a more systems-level approach in my investigation in an effort to effect second-order change.

To have examined these broader issues in an effort to bring about second-order change here in Kitchener-Waterloo, I would have had to step outside of the university, and have selected my sample from the community. Consultation with environmentalist groups in the local community would have been a good place to start. Interviewing members of these groups, surveying the public needs, and perhaps interviewing key informants from the City's civil planning department would have provided me with information that I could have presented to politically active environmentalist

groups in this community who work toward second-order change.

If the purpose of the present study was to have worked toward second-order change here at the univeristy, a more collaborative approach to this research, as described previously, should have been taken. That is, consultation with the various stakeholders here at the university could have gleaned information that could have been used by concerned students, staff and faculty to lobby for greater environmental action at the university. Although the results will be used in an effort to help persuade the administration to initiate more environmental activities on campus, it is recognized that this is first-order change, as described previously.

As with much research, although this study answers some questions, it raises others and suggests future research possibilities. For example, the sample used was derived from a university population; would a different sample result in a different or revised model? The model developed is certainly preliminary and needs to be tested on different populations to determine its accuracy. As well, further research may identify variables excluded from this research that may be significant, and thus may result in a different model. Thus, although the model is a step in the right direction in identifying important variables which predict environmental activism, further research is needed to

determine its accuracy and relevancy to other populations.

Nonetheless, the present study is indicative of the type of research that is necessary if an understanding of responsible environmental behaviour is to be determined. Psychologists can play a vital role in this area, because of their expertise in the area of human behaviour. Developing a greater appreciation of this type of behaviour could be quite consequential. For instance, community psychologists could use such studies to help promote healthier communities. That is, by collaborating with local residents and environmentalist groups, community psychologists could help promote greater participation in environmentalist activities. Furthermore, community psychologists could also conduct joint research projects with such individuals to ensure that local environmental issues are addressed.

The need for research such as that discussed above, is obvious. The natural environment is subject to various daily assaults, resulting in some very critical problems which need to be addressed. It is necessary to understand how to change peoples' environmentally destructive behaviours if humanity, and other forms of life, are to survive. Thus, the present study was undertaken in an attempt to identify variables which predict environmental activism. It is hoped that the model of responsible environmental behaviour developed can be utilized by environmental activists and educators to help encourage

people to become more environmentally aware and active, in their pursuit to prevent further environmental deterioration.

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Appendix One: Letter to Participants

(Date)

Dear (Student, Staff Member, or Faculty Member)

In several days you will be contacted by phone and asked to participate in a 20 minute phone survey being conducted by myself and Dr. Doug McKenzie-Mohr of the Department of Psychology at Wilfrid Laurier University. Your name has been selected randomly from a listing of students, staff and faculty at Wilfrid Laurier University.

The purpose of this study is to increase our understanding of the variables that lead individuals to engage in responsible environmental behaviour. To that end, you will be asked a variety of questions regarding your thoughts, feelings and behaviours concerning environmental issues and problems.

Your assistance in this research project would be most helpful. Your participation is, however, completely voluntary. Also, you can omit any questions you wish or withdraw from the study at any time. In addition, your responses and all data obtained will be kept completely confidential. Furthermore, a summary of the results, once the study is complete, can be made available to you should you agree to participate. If you are interested in participating, please sign and return the enclosed consent form in the envelope provided.

If you should consider participating in this study, I ask that you please keep this letter, because on the reverse side a list of several scales is provided for you, to be used during the phone survey. When the phone survey is being conducted, please consult these scales, so that your time and effort will be minimized.

Thank you for your time and consideration regarding this project.

Sincerely,

Karen Hayward,
M.A. Candidate

Doug McKenzie-Mohr, Ph.D.
Assistant Professor
(Extension 2854)

Encl.

Appendix Two: List of Scales

Scale #1

- 1 - no control
- 2 - very little control
- 3 - little control
- 4 - some control
- 5 - considerable control
- 6 - very considerable control
- 7 - total control

Scale #2

- 1 - not at all effective
- 2 - a little effective
- 3 - slightly effective
- 4 - somewhat effective
- 5 - considerably effective
- 6 - very considerably effective
- 7 - totally effective

Scale #3

- 1 - to no extent
- 2 - to almost no extent
- 3 - to a slight extent
- 4 - to a moderate extent
- 5 - to a considerable extent
- 6 - to a very considerable extent
- 7 - to a great extent

Scale #4

- 1 - not at all skilled
- 2 - a little skilled
- 3 - slightly skilled
- 4 - moderately skilled
- 5 - considerably skilled
- 6 - very considerably skilled
- 7 - greatly skilled

Scale #5

- 1 - no responsibility
- 2 - a little responsibility
- 3 - slight responsibility
- 4 - some responsibility
- 5 - considerable responsibility
- 6 - very considerable responsibility
- 7 - total responsibility

Appendix Three: Consent Form

The phone survey includes a variety of questions regarding your thoughts, feelings, knowledge and behaviours concerning the environment. This questionnaire is part of a research project that is being conducted by Karen Hayward and Dr. Doug McKenzie-Mohr.

We would like to ask for your assistance in this project. However, it is important that you realize that you are under no obligation to participate. Your participation is completely voluntary. Further, should you decide to participate, your responses will be kept completely confidential.

Also, should you decide to participate, you may omit any questions that you do not wish to answer, and may withdraw your participation at any time.

By signing this form, you indicate that you have willingly consented to participate in this study. Please return this consent form in the enclosed envelope.

Signed: _____

Date: _____

Appendix Four: Introduction to Phone Survey

Hello, may I speak with _____? _____, my name is _____. I am a research assistant (/graduate student) working with Dr. Doug McKenzie-Mohr who is a professor of psychology at Laurier. Dr. McKenzie-Mohr is conducting a phone survey looking at students', staff and faculty's reactions to environmental issues.

[If consent form sent]: Recently we sent you a letter, a list of scales and a consent form. You mailed back the consent form, indicating your willingness to participate in the study. Do you still wish to participate? [If yes go to a, if no go to b.]

[If consent form not sent]: You've probably received a letter from us telling you about the study. Did you receive the letter? [If yes go to #1, if no go to #2.]

1) As the letter explained, you have been randomly selected, along with 400 other students, staff and faculty at Laurier. If you agree to participate I'll be asked you a series of questions regarding your thoughts about environmental concerns. The questionnaire will only take about 20 minutes to complete. Although you didn't mail back the consent form, would you be interested in helping us out and doing the survey with me now? It's important that we get as many of the students, staff and faculty that we are calling as is possible to participate. Only then will we be able to generalize our findings to all students, staff and faculty at Laurier. Would you like to participate? [If yes, ask participant to please mail in the consent form and then go to (a); if no go to (b).]

(a) Prior to beginning the survey I'd like to mention that I'll be working through the questionnaire quite quickly. I'll be doing this primarily because of the large number of phone surveys that we have to complete.

Do you have your list of scales? [If no, "Most of the scales used are seven-point scales. So, it would speed things up a bit if you just stop me when you've heard the answer that you think is appropriate."] Do you have any questions? [If no, "Okay then, let's begin."]

(b) If this isn't a good time for me to be calling I can arrange to call you at another time. Is there another time that would be more convenient for you?

[Remind them to have the list of scales handy.]

[If individual still not willing]: Would you mind if I ask you a few questions that would help us distinguish if there are any differences between those who wish to participate and those who do not? [If individual is willing, administer Refusal Survey.]

2) The letter has probably been held up in the mail. The letter explained that you have been randomly selected, along with 400 other students, staff and faculty at Laurier. If you agree to participate I'll be asked you a series of questions regarding your thoughts about environmental concerns. The questionnaire will only take about 15 to 20 minutes to complete. Would you be interested in helping us out and doing the survey with me now? It's important that we get as many of the students, staff and faculty that we are calling as is possible to participate. Only then will we be able to generalize our findings to all students, staff and faculty at Laurier. Would you like to participate? [If yes go to (a), if no go to (b).]

Appendix Five: Phone Survey

Worry

"I'd like to begin by asking you how much you worry about the destruction of the environment."

Would you say you worry, "1 - not at all", "2 - once or twice a year", "3 - four to six times a year", "4 - once or twice a month", "5 - once or twice a week" or "6 - almost every day?"

Environmental Action Activities

"I am now going to list a series of activities aimed at helping to prevent or reduce environmental destruction. For the following I would like you to tell me how many times in the last year you have done the activity."

"How many times in the last year have you..."

[If the participant has not done the activity, then ask "How many times in the last year have you considered..."]

1. Engaged in an informal discussion, in order to encourage someone to be more supportive of protecting the environment.
2. Informed yourself about environmental issues through reading magazine and/or newspaper articles, watching television documentaries and/or attending public meetings or lectures.
3. Taken steps to reduce your electricity/energy consumption in your home, office or residence (e.g., by turning off lights).
4. Stopped buying a product because it had potentially harmful environmental effects.
5. Purchased a product because you thought it was environmentally safe.
6. Used public transportation, carpools, a bicycle, or walked instead of a car, in an effort to help improve the quality of the environment.
7. Donated money and/or given time to support an environmental organization.

8. Voted for a political candidate, in part, because he/she supported positive environmental action.
9. Tried to reduce the amount of paper you use or produce.
10. Bought a paper product because it was made from recycled paper.
11. Recycled paper and/or glass and/or cans and/or organic refuse.

Environmental Sensitivity

"These next two statements will assess how much you have been involved in outdoor activities. After each statement is read, I will ask you whether or not you agree with it."

1. When I was growing up, I spent a lot of time with family or friends enjoying outdoor activities such as camping, hiking, swimming, fishing, etc.

"Would you say you agree, disagree or neither agree nor disagree?"

If agree, "Would you say that you strongly agree, moderately agree or only slightly agree?"

If disagree, "Would you say that you strongly disagree, moderately disagree or only slightly disagree?"

2. Currently, I spend a lot of time enjoying outdoor activities such as camping, hiking, fishing, etc.

"Would you say you agree, disagree or neither agree nor disagree?"

If agree, "Would you say that you strongly agree, moderately agree or only slightly agree?"

If disagree, "Would you say that you strongly disagree, moderately disagree or only slightly disagree?"

Attitudes toward the Environment

"This next series of questions regard your general attitudes toward the environment. After each statement is read I will ask you whether or not you agree with it."

1. I believe in encouraging others, through informal discussion, to be more involved in helping to improve the quality of the environment.

"Would you say you agree, disagree or neither agree nor disagree?"

If agree, "Would you say that you strongly agree, moderately agree or only slightly agree?"

If disagree, "Would you say that you strongly disagree, moderately disagree or only slightly disagree?"

2. I believe in informing myself as much as possible about environmental issues. For example, by reading magazine or newspaper articles, watching television documentaries or newscasts, or attending public meetings or lectures.

"Would you say you agree, disagree or neither agree nor disagree?"

If agree, "Would you say that you strongly agree, moderately agree or only slightly agree?"

If disagree, "Would you say that you strongly disagree, moderately disagree or only slightly disagree?"

3. I believe that people should use public transportation, carpools, bicycles or walk, instead of using cars, as much as possible to help improve the quality of the environment.

"Would you say you agree, disagree or neither agree nor disagree?"

If agree, "Would you say that you strongly agree, moderately agree or only slightly agree?"

If disagree, "Would you say that you strongly disagree, moderately disagree or only slightly disagree?"

4. I believe it is important for consumers to purchase products that are environmentally safe.

"Would you say you agree, disagree or neither agree nor disagree?"

If agree, "Would you say that you strongly agree, moderately agree or only slightly agree?"

If disagree, "Would you say that you strongly disagree, moderately disagree or only slightly disagree?"

5. I believe it is important to support environmental organizations by donating money and/or giving time.

"Would you say you agree, disagree or neither agree nor disagree?"

If agree, "Would you say that you strongly agree, moderately agree or only slightly agree?"

If disagree, "Would you say that you strongly disagree, moderately disagree or only slightly disagree?"

6. I believe it is important for students, staff and faculty at Wilfrid Laurier University to try to reduce the amount of paper used or produced.

"Would you say you agree, disagree or neither agree nor disagree?"

If agree, "Would you say that you strongly agree, moderately agree or only slightly agree?"

If disagree, "Would you say that you strongly disagree, moderately disagree or only slightly disagree?"

7. I believe it is important for students, staff and faculty at Wilfrid Laurier University to try to purchase paper products made from recycled paper fibre as much as possible.

"Would you say you agree, disagree or neither agree nor disagree?"

If agree, "Would you say that you strongly agree, moderately agree or only slightly agree?"

If disagree, "Would you say that you strongly disagree, moderately disagree or only slightly disagree?"

8. I believe it is important for students, staff and faculty at Wilfrid Laurier University to recycle paper, cans and glass as much as possible.

"Would you say you agree, disagree or neither agree nor disagree?"

If agree, "Would you say that you strongly agree, moderately agree or only slightly agree?"

If disagree, "Would you say that you strongly disagree, moderately disagree or only slightly disagree?"

9. I believe that I have suffered some personal harm from an environmental problem.

"Would you say you agree, disagree or neither agree nor disagree?"

If agree, "Would you say that you strongly agree, moderately agree or only slightly agree?"

If disagree, "Would you say that you strongly disagree, moderately disagree or only slightly disagree?"

Perceptions of Efficacy

"These next couple of questions will assess how much control you feel the public has in helping to improve the quality of the environment."

[If participant has list of scales, "The scale I will be using is scale #1."]

1. In general, how much control do you feel that you, in collaboration with others, have in helping to improve the quality of the environment?

Would you say that you, in collaboration with others, have "1 - no control", "2 - very little control", "3 - little control", "4 - some control", "5 - considerable control", "6 - very considerable control", or "7 - total control?"

2. How much control or impact do you feel that you, in working with faculty, staff and students at Wilfrid Laurier University can have in helping to reduce the amount of waste or garbage that the University generates?

Would you say that you, in collaboration with others, have "1 - no control", "2 - very little control", "3 - little control", "4 - some control", "5 - considerable control", "6 - very considerable control", or "7 - total control?"

Political/Tactical Efficacy

"This next section deals with how effective you think different tactics are in helping to improve the quality of the environment."

[If participant has list of scales, "I will be using scale #2."]

1. How effective do you think informally encouraging others to be more involved in environmental issues is in helping to improve the quality of the environment?

Would you say this is: "1 - not at all effective", "2 - a little effective", "3 - slightly effective", "4 - somewhat effective", "5 - considerably effective", "6 - very considerably effective", or "7 - totally effective?"

2. How effective do you think informing yourself as much as possible about environmental issues is in helping to improve the quality of the environment?

Would you say this is: "1 - not at all effective", "2 - a little effective", "3 - slightly effective", "4 - somewhat effective", "5 - considerably effective", "6 - very considerably effective", or "7 - totally effective?"

3. How effective do you think using alternate forms of transportation (e.g., using a bicycle instead of a car) is in helping to improve the quality of the environment?

Would you say this is: "1 - not at all effective", "2 - a little effective", "3 - slightly effective", "4 - somewhat effective", "5 - considerably effective", "6 - very considerably effective", or "7 - totally effective?"

4. How effective do you think purchasing products that are environmentally safe is in helping to improve the quality of the environment?

Would you say this is: "1 - not at all effective", "2 - a little effective", "3 - slightly effective", "4 - somewhat effective", "5 - considerably effective", "6 - very considerably effective", or "7 - totally effective?"

5. How effective do you think donating money and/or giving time to support an environmental organization is in helping to improve the quality of the environment?

Would you say this is: "1 - not at all effective", "2 - a little effective", "3 - slightly effective", "4 - somewhat effective", "5 - considerably effective", "6 - very considerably effective", or "7 - totally effective?"

6. How effective do you think reducing the amount of paper produced or used is in helping to improve the quality of the environment?

Would you say this is: "1 - not at all effective", "2 - a little effective", "3 - slightly effective", "4 - somewhat effective", "5 - considerably effective", "6 - very considerably effective", or "7 - totally effective?"

7. How effective do you think purchasing paper products made from recycled paper fibre is in helping to improve the quality of the environment?

Would you say this is: "1 - not at all effective", "2 - a little effective", "3 - slightly effective", "4 - somewhat effective", "5 - considerably effective", "6 - very considerably effective", or "7 - totally effective?"

8. How effective do you think recycling is in helping to improve the quality of the environment?

Would you say this is: "1 - not at all effective", "2 - a little effective", "3 - slightly effective", "4 - somewhat effective", "5 - considerably effective", "6 - very considerably effective", or "7 - totally effective?"

Knowledge of Action Strategies

"This next series of questions will assess how knowledgeable you feel you are about strategies used to help improve the quality of the environment."

[If participant has list of scales, "I will be using scale #3."]

1. To what extent do you believe that you are knowledgeable about persuading others to participate in activities which may help to improve the quality of the environment?

Would you say, "1 - to no extent", "2 - to almost no extent", "3 - to a slight extent", "4 - to a moderate extent", "5 - to a considerable extent", "6 - to a very considerable extent", or "7 - to a great extent?"

2. To what extent do you believe you are knowledgeable about different environmental issues and concerns?

Would you say, "1 - to no extent", "2 - to almost no extent", "3 - to a slight extent", "4 - to a moderate extent", "5 - to a considerable extent", "6 - to a very considerable extent", or "7 - to a great extent?"

3. To what extent do you believe that you are knowledgeable about forms of transportation that have minimal harmful environmental effects?

Would you say, "1 - to no extent", "2 - to almost no extent", "3 - to a slight extent", "4 - to a moderate extent", "5 - to a considerable extent", "6 - to a very considerable extent", or "7 - to a great extent?"

4. To what extent do you believe that your are knowledgeable about purchasing products that have minimal harmful environmental effects?

Would you say, "1 - to no extent", "2 - to almost no extent", "3 - to a slight extent", "4 - to a moderate extent", "5 - to a considerable extent", "6 - to a very considerable extent", or "7 - to a great extent?"

5. To what extent do you believe you are knowledgeable about how effective different environmental organizations are in helping to improve the quality of the environment?

Would you say, "1 - to no extent", "2 - to almost no extent", "3 - to a slight extent", "4 - to a moderate extent", "5 - to a considerable extent", "6 - to a very considerable extent", or "7 - to a great extent?"

6. To what extent do you believe you are knowledgeable about strategies that could be used to help reduce the amount of paper produced or used at Wilfrid Laurier University?

Would you say, "1 - to no extent", "2 - to almost no extent", "3 - to a slight extent", "4 - to a moderate extent", "5 - to a considerable extent", "6 - to a very considerable extent", or "7 - to a great extent?"

7. To what extent do you believe you are knowledgeable about where to purchase paper products made from recycled paper fibre?

Would you say, "1 - to no extent", "2 - to almost no extent", "3 - to a slight extent", "4 - to a moderate extent", "5 - to a considerable extent", "6 - to a very considerable extent", or "7 - to a great extent?"

8. To what extent do you believe that you are knowledgeable about recycling?

Would you say, "1 - to no extent", "2 - to almost no extent", "3 - to a slight extent", "4 - to a moderate extent", "5 - to a considerable extent", "6 - to a very considerable extent", or "7 - to a great extent?"

Perception of Skill

[If participant has list of scales, "For this next question I will be using scale #4.]

1. How skilled do you think you are in using the strategies we just went through to help improve the quality of the environment?

Would you say you are, "1 - not at all skilled", "2 - a little skilled", "3 - slightly skilled", "4 - moderately skilled", "5 - considerably skilled", "6 - very considerable skilled", or "7 - greatly skilled?"

Situational Variables

"The next few questions deal with possible commitments that may limit the extent to which you are involved in pro-environmental activities."

[If participant has list of scales, "For this next series of questions I will again be using scale #3."]

1. To what extent do you believe that your time commitments to your family and/or friends prevent you from becoming more involved in activities that may help improve the quality of the environment?

Would you say this prevents you, "1 - to no extent", "2 - to almost no extent", "3 - to a slight extent", "4 - to a moderate extent", "5 - to a considerable extent", "6 - to a very considerable extent", or "7 - to a great extent?"

2. To what extent do you believe that your time commitments to other organizations prevent you from becoming more involved in activities that may help improve the quality of the environment?

Would you say this prevents you, "1 - to no extent", "2 - to almost no extent", "3 - to a slight extent", "4 - to a moderate extent", "5 - to a considerable extent", "6 - to a very considerable extent", or "7 - to a great extent?"

3. To what extent do you believe that your time commitments to your career and/or schoolwork prevent you from becoming more involved in activities that may help improve the quality of the environment?

Would you say this prevents you, "1 - to no extent", "2 - to almost no extent", "3 - to a slight extent", "4 - to a moderate extent", "5 - to a considerable extent", "6 - to a very considerable extent", or "7 - to a great extent?"

4. To what extent do you believe that economic constraints prevent you from supporting environmental organizations?

Would you say this prevents you, "1 - to no extent", "2 - to almost no extent", "3 - to a slight extent", "4 - to a moderate extent", "5 - to a considerable extent", "6 - to a very considerable extent", or "7 - to a great extent?"

5. To what extent do you believe that lack of convenient recycling containers prevents you from recycling fine paper, newsprint and cans on campus?

Would you say this prevents you, "1 - to no extent", "2 - to almost no extent", "3 - to a slight extent", "4 - to a moderate extent", "5 - to a considerable extent", "6 - to a very considerable extent", or "7 - to a great extent?"

6. To what extent do you believe that lack of community support, in general, for positive environmental action prevents you from becoming more involved in activities that may help improve the quality of the environment?

Would you say this prevents you, "1 - to no extent", "2 - to almost no extent", "3 - to a slight extent", "4 - to a moderate extent", "5 - to a considerable extent", "6 - to a very considerable extent", or "7 - to a great extent?"

7. Do you have friends, acquaintances, or members of your family who are presently involved in pro-environmental activities?

If yes, "Would you say you have one, a couple, several, 5 - 10, more than 10, more than 20?"

Personal Responsibility

1. How much personal responsibility do you feel for improving the quality of the environment?

[If participant has list of scales, "I will now be using scale #5."]

Would you say, "1 - no responsibility", "2 - a little responsibility", "3 - slight responsibility", "4 - some responsibility", "5 - considerable responsibility", "6 - very considerable responsibility", or "7 - total responsibility?"

Knowledge of Issues

This next series of questions deal with your knowledge of environmental issues. As I read the following statements, please indicate whether you regard each statement as true or false.

1. One of the most common pollutants of water are phosphates, found in many household detergents (T).

"Would you say this is true, false, or do you not know?"

If True, "Would you say this is probably true or definitely true?"

If False, "Would you say this is probably false, or definitely false?"

2. DDT, an insecticide, has been singled out as the leading cause of the deterioration of the earth's ozone layer (F - CFC's).

"Would you say this is true, false, or do you not know?"

If True, "Would you say this is probably true or definitely true?"

If False, "Would you say this is probably false, or definitely false?"

3. The greenhouse effect, or the global warming of the planet, will result in an extinction of a large number of plants and animals (T).

"Would you say this is true, false, or do you not know?"

If True, "Would you say this is probably true or definitely true?"

If False, "Would you say this is probably false, or definitely false?"

4. Dioxins, used in the bleaching process of paper products, have been found in the milk of the average North American mother (T).

"Would you say this is true, false, or do you not know?"

If True, "Would you say this is probably true or definitely true?"

If False, "Would you say this is probably false, or definitely false?"

5. Most smog in our cities comes from industrial plants (F - automobiles).

"Would you say this is true, false, or do you not know?"

If True, "Would you say this is probably true or definitely true?"

If False, "Would you say this is probably false, or definitely false?"

6. The depletion of the ozone layer, resulting in an increase in the amount of ultraviolet rays making their way to earth, will damage the human immune system and dramatically increase the incidence of skin cancer (T).

"Would you say this is true, false, or do you not know?"

If True, "Would you say this is probably true or definitely true?"

If False, "Would you say this is probably false, or definitely false?"

7. Paper waste accounts for only 5 to 10% of all municipal solid waste in Ontario (F - 35%).

"Would you say this is true, false, or do you not know?"

If True, "Would you say this is probably true or definitely true?"

If False, "Would you say this is probably false, or definitely false?"

8. Recycled paper fibre represents about one-half of the total fibre used in the production of wood pulp, paper and paperboard in Canada (F - 7%).

"Would you say this is true, false, or do you not know?"

If True, "Would you say this is probably true or definitely true?"

If False, "Would you say this is probably false, or definitely false?"

9. The Region of Waterloo recycles less than 5% of its household waste (T - 3%).

"Would you say this is true, false, or do you not know?"

If True, "Would you say this is probably true or definitely true?"

If False, "Would you say this is probably false, or definitely false?"

11. Are you now taking or have you ever taken a course in conservation, ecology and/or environmental concerns?

Yes_____

No_____

Demographic Variables

In this last section, I would like to ask you a few demographic questions.

1. Which age group do you belong in?
 - A) 20 and under
 - B) 21-30
 - C) 31-40
 - D) 41-50
 - E) 51-60
 - F) over 60
2. Male_____ Female_____ (don't ask)
3. Are you currently a college/university student? (don't ask if known)

Yes_____ No_____
4. What is your educational background? (don't ask if known)
 - A) some high school
 - B) high school graduate
 - C) some college
 - D) college graduate
 - E) graduate work
 - F) Other_____
5. What is your combined family income?
 - A) under \$20,000
 - B) \$20,000 to \$30,000
 - C) \$30,000 to \$40,000
 - D) \$40,000 to \$50,000
 - E) over \$50,000
6. Would you describe yourself as liberal, conservative, middle-of-the-road, or other?

If liberal, "Would you say you are very liberal, somewhat liberal or only moderately liberal?"

If conservative, "Would you say you are very conservative, somewhat conservative, or only moderately conservative?"

Other (specify)_____
7. Do you have any children?

Yes_____ No_____

8. If Laurier were to periodically offer one-hour seminars on environmental issues, how likely would you be to attend?

Would you say, "1 - not at all likely", "2 - a little likely", "3 - somewhat likely", "4 - quite likely", "5 - very likely", "6 - extremely likely", or "7 - definitely".

9. Is there anything you'd like to see Laurier do with respect to environmental concerns?

10. Did you have any comments about the questionnaire, or any questions you'd like to ask?

11. Would you like to be mailed the results of this study? (If yes, take down address in booklet, and inform them that it will be 2 or 3 months before something is made available to them.)

THANK YOU VERY MUCH FOR YOUR PARTICIPATION.

Appendix Six: Refusal Survey

1. Which age group do you belong in:
 - A) 20 and under
 - B) 21-30
 - C) 31-40
 - D) 41-50
 - E) 51-60
 - F) over 60

2. male _____ female _____ (don't ask)

3. What is your educational background? (don't ask if known)
 - A) some high school
 - B) high school graduate
 - C) some college or university
 - D) college or university graduate
 - E) graduate work
 - F) other_____

4. What is your combined family income?
 - A) under 20,000
 - B) 20,000 to 30,000
 - C) 30,000 to 40,000
 - D) 40,000 to 50,000
 - E) over 50,000

5. How much do you worry about the destruction of the environment?

Would you say "1 - not at all", "2 - once or twice a year", "3 - four to six times a year", "4 - once or twice a month", "5 - once or twice a week", or "6 - almost every day"?

6. How much control do you feel that you, in collaboration with others, have in helping to improve the quality of the environment?

Would you say "1 - no control", "2 - a little control", "3 - slight control", "4 - moderate control", "5 - considerable control", "6 - very considerable control", or "7 - total control"?

7. Do you have friends, acquaintances, or family members who are presently involved in activities aimed at improving the quality of the environment?

If yes, would you say "one", "a couple", "several", "5 - 10", "more than 10" or "more than 20"?

Appendix Seven: Sample Composition

Level of Education:

1)	Some high school	.5%
2)	High school graduate	4.5%
3)	Some college or university	41.5%
4)	College or university graduate	14.5%
5)	Graduate work	38.5%
6)	Other	.5%

Level of Knowledge of Environmental Issues

Item #1 -- Phosphates:

1)	Answered incorrectly	6.5%
2)	Did not know	16.5%
3)	Answered correctly	77.0%

Item #2 -- DDT:

1)	Answered incorrectly	10.4%
2)	Did not know	25.4%
3)	Answered correctly	58.2%

Item #3 -- Greenhouse effect:

1)	Answered incorrectly	10.5%
2)	Did not know	11.6%
3)	Answered correctly	77.9%

Item #4 -- Dioxins:

1)	Answered incorrectly	8.0%
2)	Did not know	43.0%
3)	Answered correctly	49.0%

Item #5 -- Smog:

1)	Answered incorrectly	60.3%
2)	Did not know	7.0%
3)	Answered correctly	32.7%

Item #6 -- Ozone layer:

1)	Answered incorrectly	2.0%
2)	Did not know	5.0%
3)	Answered correctly	93.0%

Item #7 -- Paper waste:

1)	Answered incorrectly	24.4%
2)	Did not know	37.8%
3)	Answered correctly	37.8%

Item #8 -- Recycled paper:

1)	Answered incorrectly	19.9%
2)	Did not know	44.3%
3)	Answered correctly	35.8%

Item #9 -- Recycling

1)	Answered incorrectly	14.0%
2)	Did not know	28.0%
3)	Answered correctly	58.0%

Level of Involvement in Environmental Action Activities:

Item #1 -- Engaged in an informal discussion:

1)	Not at all in the last year	8.5%
1)	Once a month or less	55.0%
2)	More than once a month	36.5%

Item #2 -- Informed self about environmental issues:

1)	Not at all in the last year	.5%
2)	Once a month or less	35.3%
3)	More than once a month	64.2%

Item #3 -- Reduced energy consumption:

1)	Not at all in the last year	2.5%
2)	Once a month or less	7.5%
3)	More than once a month	90.0%

Item #4 -- Stopped buying harmful products:

1)	Not at all in the last year	15.0%
2)	Once a month or less	57.0%
3)	More than once a month	28.0%

Item #5 -- Purchased safe products:

1)	Not at all in the last year	10.9%
2)	Once a month or less	52.1%
3)	More than once a month	37.0%

Item #6 -- Used other forms of transportation:

- | | | |
|----|-----------------------------|-------|
| 1) | Not at all in the last year | 42.4% |
| 2) | Once a month or less | 20.6% |
| 3) | More than once a month | 27.0% |

Item #7 -- Donated money/time to organization:

- | | | |
|----|-----------------------------|-------|
| 1) | Not at all in the last year | 42.1% |
| 2) | Once a month or less | 51.7% |
| 3) | More than once a month | 6.2% |

Item #8 -- Voted for a political candidate:

- | | | |
|----|-------------------------------------|-------|
| 1) | Not at all in the last two years | 49.7% |
| 2) | Once or twice in the last two years | 48.5% |
| 3) | Three times in the last two years | 1.8% |

Item #9 -- Reduced paper usage:

- | | | |
|----|-----------------------------|-------|
| 1) | Not at all in the last year | 17.3% |
| 2) | Once a month or less | 14.7% |
| 3) | More than once a month | 68.0% |

Item #10 -- Bought recycled paper:

- | | | |
|----|-----------------------------|-------|
| 1) | Not at all in the last year | 30.2% |
| 2) | Once a month or less | 42.3% |
| 3) | More than once a month | 27.5% |

Item #11 -- Recycled:

- | | | |
|----|-----------------------------|-------|
| 1) | Not at all in the last year | 5.9% |
| 2) | Once a month or less | 7.0% |
| 3) | More than once a month | 87.1% |

Appendix Eight: Results Relevant to WLU

1. In response to "I believe it is important for students, staff and faculty at WLU to try to reduce the amount of paper reduced or used"

Strongly disagree	1	.5%
Moderately disagree	1	.5%
Slightly disagree	2	1.0%
Neither disagree nor agree	3	1.5%
Slightly agree	6	3.0%
Moderately agree	30	14.9%
Strongly agree	159	78.7%

2. In response to "I believe it is important for students, staff and faculty at WLU to try to purchase paper products made from recycled paper fibre as much as possible"

Strongly disagree	0	
Moderately disagree	0	
Slightly disagree	1	.5%
Neither disagree nor agree	0	
Slightly agree	8	4.0%
Moderately agree	38	18.8%
Strongly agree	153	75.7%

3. In response to "I believe it is important for students, staff and faculty at WLU to recycle paper, cans and glass as much as possible"

Strongly disagree	0	
Moderately disagree	0	
Slightly disagree	0	
Neither disagree nor agree	1	.5%
Slightly agree	5	2.5%
Moderately agree	11	5.4%
Strongly agree	185	91.6%

4. In response to "How much control do you feel that you, in working with faculty, staff and students at WLU can have in helping to reduce the amount of waste that the university generates?"

No control	4	2.0%
Very little control	11	5.5%
Little control	12	6.0%
Some control	35	17.5%
Considerable control	65	32.5%
Very considerable control	62	31.0%
Total control	11	5.5%

5. In response to "To what extent do you believe that you are knowledgeable about strategies that could be used to help reduce the amount of paper that the university generates"

To no extent	38	18.8%
To almost no extent	46	22.8%
To a slight extent	45	22.3%
To a moderate extent	47	23.3%
To a considerable extent	14	6.9%
To a very considerable extent	8	4.0%
To a great extent	4	2.0%

6. In response to "To what extent do you believe that lack of convenient containers prevents you from recycling fine paper, newsprint and cans on campus"

To no extent	32	16.4%
To almost no extent	18	9.2%
To a slight extent	19	9.7%
To a moderate extent	22	10.9%
To a considerable extent	36	18.5%
To a very considerable extent	31	15.3%
To a great extent	37	19.0%

7. In response to "If Laurier were to periodically offer one-hour seminars on environmental issues, how likely would you be to attend"

Not at all likely	17	8.6%
A little likely	26	13.2%
Somewhat likely	37	18.8%
Quite likely	36	18.3%
Very likely	34	17.3%
Extremely likely	22	11.2%
Definitely	25	12.7%

Suggestions about what respondents would like to see Laurier do with respect to environmental concerns:¹⁸

Awareness/Education:

- increase awareness of environmental issues, either through the availability of convenient free seminars, or through advertising, guest speakers, etc. (54)

¹⁸ The number in the brackets following each item indicated the number of respondents who made the suggestion.

- curriculum should include formal courses on environmental issues(8)
- publish newsletters on environmental issues (3)
- carry on education with WHMIS
- engage business department in ecological/environmental questions and problems

Specific suggestions for environmental initiatives:

- recycling efforts should be increased (e.g., increase the number and visibility of recycling bins around campus, increase the number of bins in computers rooms and get rid of garbage bags) (approximately 117)
- get rid of or discourage use of styrofoam and plastic in cafeteria (31)
- reduce paper usage on campus (e.g., decrease the number of memos by circulating only one memo for department or using electronic mail, print on both sides, reduce the number of flyers) (25)
- make recycled paper available (i.e., in bookstore) and purchase paper and paper products made from recycled paper (21)
- reduce energy bills (e.g., by turning off unused lights, giving residences ability to control heat and air conditioning, and perhaps using alternate forms of heating) (13)
- residences should have recycling bins (10)
- stop spraying lawns with chemicals; use non-chemical sprays (5)
- university should give some incentives for encouraging the use of public transportation (e.g., by providing more and better bike racks, offering organized carpools or free bus passes) (4)
- smoking areas should all be banned (2)
- give out recycling containers to people who live in apartments

- hire an environmental coordinator
- underground parking now being proposed should be abandoned

Less specific suggestions:

- the university should make environmental issues more high profile by increasing efforts made by administration, communicating with general public and getting involved in community projects, making 3Rs committee more visible (7)
- careful consideration should be given to purchase of products (i.e., that they are environmentally friendly) (2)
- form a group to put more pressure on politicians
- cleaner air
- interior lighting is poor for health, consideration should be given to this
- increase lobbying ability; try new innovative research
- lobby for better bus service to university;
- integrate efforts of different departments
- make donations to environmental organizations