

CHAPTER 2 ATTITUDES AND ENVIRONMENTAL CONCERN

2.1 The nature of attitudes

The concept of **attitude** is common to most, if not all, branches of psychology, but it is the field of social psychology that has focussed substantive attention on the nature and structure of attitudes more than any other area. Jaspars (1986) describes it as one of the key concepts of social psychology. Despite this dedicated focus on attitudes as a field of inquiry, a common understanding and definition of the concept among the various disciplines within the social sciences appears to have been extremely elusive.

G.W. Allport considered attitude as a neural or mental state of readiness (Murchison, 1935), implying that an attitude cannot be directly observed, but must be inferred from overt behaviour. Behaviour is seen as a response to some form of stimulus, and an attitude was conceptualized as a construct, an inferred state occurring between a stimulus and a response. As an alternative approach, Berkowitz (1975) describes an attitude in terms of the favourableness or unfavourableness of feelings towards an object or issue. Feelings, or affect, contribute to the determination of the degree of favourableness or unfavourableness. According to this model, attitudes involve a process of evaluation, which indicates how much the object or issue is liked or disliked. For any one individual, this process of evaluation is, in general, relatively stable across time. Cognitions or beliefs which substantiate or originate from the affective feelings are sometimes considered an integral part of an attitude.

There are currently several views regarding the formation of attitudes in general. There is some evidence suggesting that attitudes may be formed directly by sensory input (Zajonc, 1984), or that some people may be genetically predisposed to develop certain attitudes (Arvey, Bouchard, Segal & Abraham, 1989; Keller,

Bouchard, Arvey, Segal & Dawis, 1992). However, Bell et al. (1996) express the opinion that most theorists believe that attitudes are formed either by conditioning or by social learning.

With regard to the relationship between attitude and behaviour, psychologists have been concerned about the lack of attitude-behaviour correspondence, that is, the inability of most attitudes to predict behaviour accurately (Bell et al., 1996). This topic will be discussed in Section 2.5.2.

2.1.1 Attitudes, beliefs and behaviours

The concept of attitude will be discussed beginning with the “traditional” three-component, or tripartite, model (Triandis, 1971; Borden & Schettino, 1979), and a modification of this, namely, the evaluative-response model (Zanna & Rempel, 1988). Two algebraic perspectives, the adding and averaging perspectives, for assessing attitude strength, will be presented.

A **three-component model** of attitude as an inferred state is shown in Figure 2.1, the three components being: cognitive, affective and behavioural (Triandis, 1971; Borden & Schettino, 1979). The cognitive component refers to thoughts and ideas about the attitude object. The affective component refers to feelings and emotions regarding the attitude object. The behavioural component refers to overt behaviours as well as behavioural intentions relating to the attitude object. Behavioural intentions may be seen as precursors of possible future behaviours. Attitude may therefore be seen as an intervening variable occurring between the stimulus and the cognitive, affective and behavioural components.

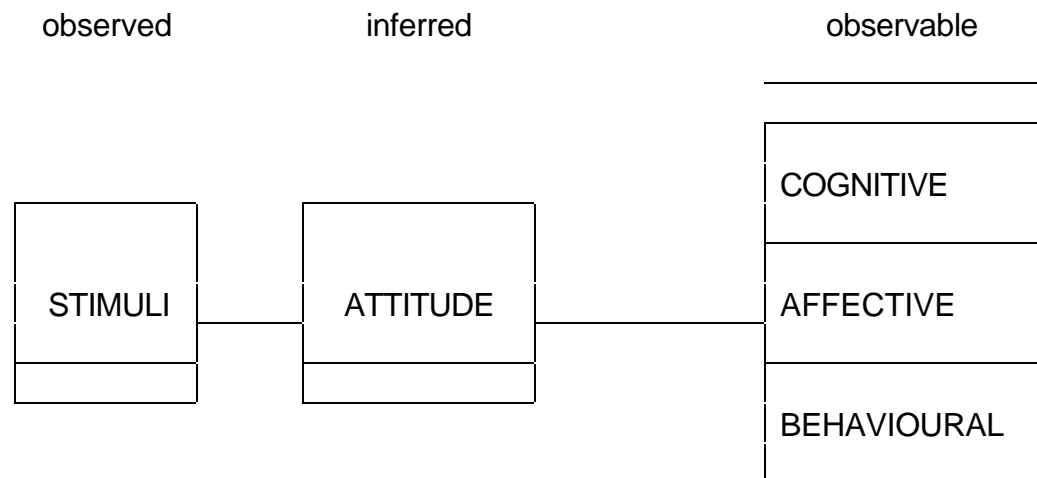


Figure 2.1 Attitude as an inferred state with cognitive, affective and behavioural components

The construct of attitude as an inferred state as depicted in Figure 2.1 may be expanded into a model of attitude formation and expression in which the cognitive, affective and behavioural components of an attitude are conceptualized as responses which result from the process of evaluating perceived stimuli (Zanna & Rempel, 1988) as shown in Figure 2.2.

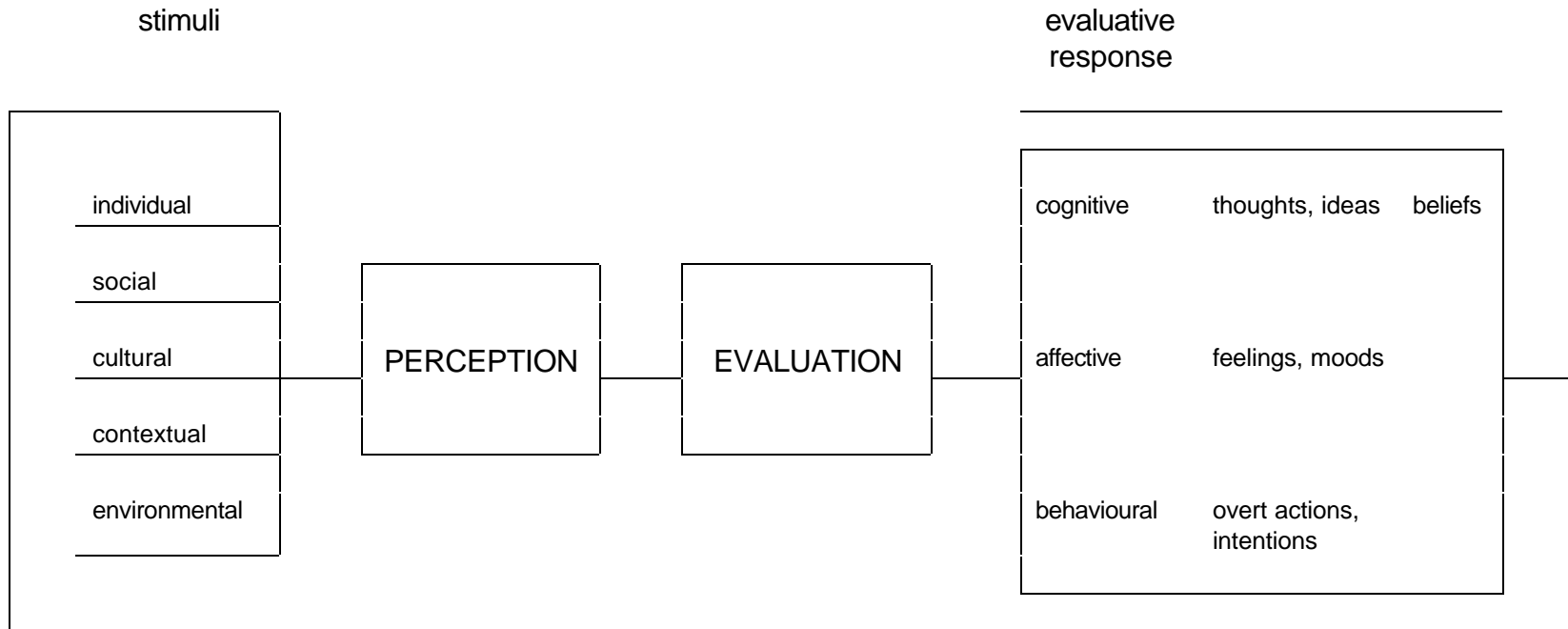


Figure 2.2 Attitude formation and expression as an evaluative process

Categories of incoming stimuli are individual, social, cultural, contextual, environmental, (Eagly & Chaiken, 1993) as well as feedback resulting from the process of attitude formation and expression itself, indicating a recursive process.

Perception refers to the processing of incoming stimuli. Jordaan, Jordaan and Nieuwoudt (1975, p311) define perception as *"a psychophysiological process through which sensory input acquires meaning"*. Incoming stimuli invoke a state of arousal in a person. In order to function effectively in his or her world, the person must interpret the state of arousal appropriately. Sensory information obtained in this way may be processed and compared with information already stored in memory, and may be used for various purposes. For example, it may be used to make decisions or to guide actions, either immediately or at a later time, or it may be assimilated with other information for future use. In this way a person makes sense of their world.

With specific reference to the environment, the terms "environmental perception" and "environmental awareness" are sometimes used interchangeably. In the interest of clarity, it is proposed that environmental perception refers to a psychophysiological process as defined above, but limited to the processing of environmental or environmentally-related stimuli; environmental awareness refers to the state of being conscious of environmental or environmentally-related issues (Willers, 1996).

Evaluation includes the selection of stimuli relevant to the attitude object. In keeping with current ideas regarding affect, and recent conceptualizations of attitude (Zanna & Rempel, 1988), Eagly and Chaiken (1993, p12) define the process of evaluation as *"an intervening state that accounts for the covariation between classes of stimuli and the evaluative responses elicited by the stimuli"*. These researchers agree that the majority of attitudes studied by social psychologists are probably learned, but add that it would be unwise for researchers to exclude, by definition, attitudes which are not acquired by experience. Eagly and Chaiken (1993) propose that this definition is broad enough to include all theoretical explanations of attitude formation.

Cognitive evaluative responses consist of thoughts and ideas relating to the attitude, while affective evaluative responses consist of feelings, emotions and moods relating to the attitude. Behavioural evaluative responses consist of overt actions as well as intentions to act in a manner consistent with the particular attitude (Eagly & Chaiken, 1993).

The process of evaluation leads to positively, negatively or neutrally evaluated attributes of the attitude object giving rise to beliefs about the attitude object. Beliefs about an attitude object therefore link it with various attributes (Fishbein & Ajzen, 1975). These beliefs are more closely associated with the cognitive response category than the other two response categories, in turn affect the evaluation of subsequent stimuli, and hence affect attitude formation, again indicative of a recursive process (Fishbein & Ajzen, 1975; Eagly & Chaiken, 1993).

The concept of belief as proposed by Fishbein and Ajzen (1975) suggests that the link between an attitude object and its attributes is a propositional one, for example: *firearms are dangerous*. Eagly and Chaiken (1993) point out that people may not always store information about an attitude object and its attributes in propositional form, and suggest alternatives such as experiential memories and visual images as additional representations. Investigation of whether these additional representations are, or can be, represented in propositional form lies within the realm of cognitive psychology.

The original three-component model depicted in Figure 2.1, and which enjoyed considerable favour for some time, proposed consistency across the componential categories, namely, positive thoughts and feelings correlate with positive behaviours, and negative thoughts and feelings correlate with negative behaviours with respect to the attitude object (Jaspars, 1986). However, the model shown in Figure 2.2 introduced new ideas.

The thoughts, feelings and actions associated with the three evaluative response categories may be positive, negative or ambivalent (both positive and negative) with

respect to the attitude. Ambivalence may be experienced both within any one, or all, of the categories, for example, both positive and negative feelings with respect to the same attitude object, as well as across any of the categories, for example, actions which are not consistent with ideas about the attitude object (Eagly & Chaiken, 1993). Ambivalence is also associated with inconsistent behaviours relating to the attitude object.

Some theorists see the degree of separation of the cognitive response category from the affective and behavioural response categories as representing a distinction between the three-component model and the model of attitude formation and expression shown in Figure 2.2 (Jaspars, 1986). Nevertheless, by conceptualizing the components of an attitude, as depicted by the three-component model, as evaluative response categories, incorporating the concept of beliefs relative to the attributes of the attitude object, and acknowledging the differences in the conceptualization of consistency across and within categories, it is possible to find common ground between the two models. The model presented in Figure 2.2 may therefore be seen to be a development of the three-component model shown in Figure 2.1.

The conceptualization of attitudes based on beliefs with respect to the attributes of the attitude object is known as an *expectancy-value perspective* of the concept of attitude. Strength of belief (expectancy) multiplied by the evaluation (value) of the corresponding salient attribute is calculated for each salient attribute. Fishbein and Ajzen (1975) propose that the sum of these products is indicative of attitude strength. The expectancy-value model is therefore known as an algebraic **additive model**. Mathematically, the expectancy-value model is a sum-of-products model expressed as follows:

$$A = \sum b_i e_i$$

where A = attitude strength

b_i = strength of belief i

e_i = evaluation of attribute i

Some discussion has taken place with regard to whether attitude strength is more accurately predicted by an average measure as opposed to the sum (of products) measure described above. The "average" measure approach is known as an algebraic **averaging model**, and is commonly used in the *information integration perspective* of attitude formation and expression. This model emphasizes the *valuation* of incoming information and the *integration* of salient information into an existing attitude (Eagly & Chaiken, 1993). Valuation refers both to the *evaluative meaning* of information and also to its *weight*, or importance. According to the information integration averaging model, new salient information of the same value as existing information would not change attitude strength, as would occur when using the expectancy-value sum-of-products model.

In the development and expression of an attitude as a recursive process as depicted in Figure 2.2, it is reasonable to assume that, in order for appropriate behaviour to occur, a person must have developed ideas and feelings regarding the attitude object, that is, the cognitive and effective components are likely to form earlier in the recursive process than overt behaviours. Attitude may therefore be viewed as a precursor to behaviour. However, overt behaviour does not always accompany an associated attitude. Attitude-behaviour correspondence is discussed in Section 2.5.2.

The development of environmental concern (an attitude) as a precursor to, and an essential part of, environmentally responsible behaviour will be discussed in Section 2.4.

2.1.2 A definition of attitude

As can be seen from the above, the construct "attitude" may be defined in several ways. For the purpose of this research, the conceptual definition of attitude as used by Eagly and Chaiken (1993, p1) will be employed. These researchers define the construct **attitude** as "**a psychological tendency that is expressed by evaluating a particular entity with some degree of favor or disfavor**".

Some theorists describe attitudes in terms of "acquired dispositions." Eagly and Chaiken (1993) indicate that their preference is not to use the word "acquired" as it is associated too closely with the idea that attitudes are learned, and while this might apply to most attitudes, there is evidence indicating that some attitudes have a biological basis. Use of the word "disposition" is also to be discouraged, as it is often used to describe personality characteristics of people. The word "**tendency**" implies that an attitude is an internal state which is of short duration or longer, and which can be more or less well established, while "**evaluating**" refers to all types of responses in the three response categories: cognitive, affective, behavioural, namely, positive, negative, neutral, overt and covert.

Eagly and Chaiken (1993, p3) comment that the above definition of attitude as an evaluative tendency "*presumes that attitude is an evaluative state that intervenes between certain classes of stimuli and certain classes of responses*".

2.2 Attitudes towards the natural environment: Worldviews

Holahan (1982, p92) describes environmental attitudes as "*people's favorable feelings toward some feature of the physical environment or toward an issue that pertains to the physical environment*". This description includes only favourable aspects. However, should both favourable (positive) and unfavourable (negative) feelings be included, this statement may serve as a basis for a relationship between human beings and the natural environment. The nature of this relationship has been influenced by the ideas of different societies, traditions and religions for many centuries.

Differences in this relationship can be traced to different perspectives regarding whether humans are an integral part of nature, each depending on the other for survival; or whether humans are in some way superior to nature, and hence have the right to dominate and exploit the natural world regardless of the consequences.

From this flow other questions regarding whether human beings have a responsibility to protect nature, and whether the natural world is there solely for the

benefit of human beings. The answers to questions such as these determine which human actions with respect to the natural environment are considered morally and ethically correct (Ponting, 1991).

At present there appear to be two broad perspectives relating humankind to the natural environment. In general, the developed countries in the Western world have seemingly followed an approach which puts humans in a dominant, exploitative position over nature, while Eastern civilizations have tended to emphasize a reverence-for-life type of philosophy and harmony between humans and the rest of nature.

Barbour (1980, p13) states that "*Western exploitative attitudes toward nature have roots in ancient history*". The origin of these roots can be traced both to early European philosophical thinking and also to ideas which the Christian church inherited from its Jewish background. Ponting (1991, p142) points out that a common thread between these traditions is that "*human beings have been put in a position of dominance over the rest of a subordinate nature*".

By emphasizing the ability of human beings to think, to reason and to make decisions based on this thought and reasoning, early Greek philosophers such as Plato, Aristotle and the Stoics promoted the concept that humans are separate from, and superior to, other living creatures.

The role of the Christian religion as a facilitator of this apparent anthropocentric (human-centred) approach warrants further attention. In the first book of the Christian Bible, humankind is given dominion over the Earth (GEN 1:28-29). After the flood, God once again gives dominion over the world to Noah and his descendents in even more dramatic terms (GEN 9:1-3).

While these may seem definitive statements, there is an alternative which the Christian Bible also contains. One may deduce from several Biblical passages that human beings do not have unlimited authority and ultimate dominion over nature. The created realm has been established by God and belongs to Him - humans are

only caretakers or stewards of what God has entrusted to them (Barbour, 1980; Ponting, 1991). In this role, humankind cares for and respects the rest of nature as part of Creation, the well-being of which humans are, at least in part, responsible for. According to this perspective the world has value in and of itself, and has not been put there for the exclusive use of humankind. As mentioned by Ponting (1991, p145), *"humans are depicted essentially as stewards of God's creation with the task of caring for it on His behalf"*.

This approach embodies the notion of **stewardship** and is a Biblical alternative to the dominion theme. A proponent of this approach was Saint Francis of Assisi, who *"saw all creatures as equal parts of this creation, each a part of God's plan but not put there for the utilitarian purposes of humans"* (Ponting, 1991, p146).

This alternative approach indicates that the natural environment was not as neglected in the Bible as would be apparent if only the dominion theme was given attention. Barbour (1980, p14) states that Christian attitudes were not always anthropocentric, and it was only well after the Middle Ages *"that the dominion theme was misused to justify exploitative practices"*. Nevertheless, the concept of stewardship played only a minority role in influencing humankind's relationship with the natural world (Ponting, 1991).

Barbour (1980) makes use of the term "nurture" to emphasize an active role that humans need to fulfil with respect to their stewardship of the natural world, and expresses the opinion that humankind is both dependent on the well-being of, and has obligations towards, non-human creatures.

Humankind's relationship with the natural environment has been influenced, at least in the West, by Christian and early European ideas. This relationship has tended to emphasize the differences between humans and the rest of nature and has placed the former in a dominant and exploitative position over the latter. Other philosophies, notably those of the East and of the North American Indians have followed somewhat different principles. These have also been globally less influential with respect to human-environment relationships.

In general, the Eastern religions view humankind not in a position of dominance over nature, but as part of a larger cosmic whole, which consists of a multitude of smaller parts, each having multiple dependencies on other parts within the whole. Balance is maintained by harmonious part-part and part-whole relationships. The intellectual abilities of human beings should be used, not to exploit the natural environment, but to attain greater understanding of the wider cosmic order and to act wisely with respect to other creatures and the ecological system as a whole.

Within the *Buddhist* and *Jainist* religions of India, compassion for all living creatures is stressed. Likewise, the importance of understanding and appreciating nature, rather than mastering it, is emphasized (Barbour, 1980; Ponting, 1991). Chinese *Taoism* also views the world as an organic interdependent whole, with harmonious relationships between all parts an essential ingredient of continued sustainability.

The different approach to human-environment interaction of the East did not, however, mean that environmental problems were absent from this part of the world. For example, the demand for wood in China, both for building and for use as a fuel, resulted in deforestation and subsequent soil erosion (Barbour, 1980). Nevertheless, traditional Chinese philosophy does promote the idea of human co-operation with nature, rather than dominance over it.

It would appear that, at least in previous centuries, Eastern countries have treated the natural environment with more respect than Western ones have. It remains within the realm of speculation to what extent the current-day practices which exploit the natural environment engaged in by the Eastern nations, for example, whaling by Japan, have been influenced by Western thinking.

As with the Eastern peoples, harmony and balance of nature feature strongly in the culture of the indigenous North American Indian tribes. Here, the importance of humility and human dependence on other creatures is a theme often found in tribal stories and folklore, and carried out in adult life. The beliefs of the North American Indian peoples are explicitly apparent from a written communication made by Chief

Seattle of the Squamish tribe to the then-president of the United States protesting against the manner in which the European settlers were treating both the Indians and the natural environment of the country. The statement contains the following:

"... *whatever happens to the beasts also happens to the man. ... Teach man belongs to the earth. Man did not weave the web of life, he is merely a strand in it. Whatever he does to the web, he does to himself*". (Ponting, 1991, p153).

The statement was ineffectual, but perhaps indicated an awareness among the Indian peoples of the important factors affecting human-environment interaction which are essential for the sustainability of the system as a whole, something which was apparently largely irrelevant as far as most of the settlers were concerned, and in sharp contrast to their beliefs.

The traditions of the East as well as those of the North American Indians share common ground in the sense that they highlight the interdependence of human beings with other living creatures and the importance of maintaining a balance in the ecological system as a whole. These principles are different to those commonly found in the West and can only really be understood as part of a fundamentally different belief system.

In the West, however, anthropocentric practices continued. Seventeenth century writings continued to place human beings in a superior, dominating position over nature, and science began to play an increasing role in shaping humankind's relationship with the natural world. Rene` Descartes' *Discourse on Method* (1668) describes the use of science and mathematics to understand the universe by a process of quantification and of reducing wholes to their component parts. This reductionistic approach focusses on understanding the operation of individual parts of a system, each part being considered in isolation of other parts, and largely ignores interactions between parts themselves and between parts and the whole. According to Francis Bacon, the aim of science was to conquer nature (Barbour, 1980; Ponting, 1991).

Isaac Newton introduced the concept that nature is mechanistic, that is, it operates like a machine, and, as such, has no inherent rights. Following from this it is a short step to justify humankind's exploitation of nature.

The eighteenth and nineteenth centuries saw little change, and simultaneous with the development of an industrialised society at this time, the natural environment came to be seen as a source of raw materials to be used as humanity saw fit. Human actions were viewed as beneficial and part of a progressive society (Ponting, 1991).

Nevertheless, the middle-nineteenth century saw the beginnings of what could be called a different world view. Charles Darwin's *The Origin of Species* (1859) and *The Descent of Man* (1871) treat humans as an integral part of nature, and introduce the concept of an interconnected, interdependent web of life. Barbour (1980, p22) states that "*recognition of interdependence ... prepared the way for ecology*". In extolling the dangers of pesticides, Rachel Carson's *Silent Spring* (1962) combines scientific knowledge with a more-than-pragmatic sense of oneness with, and caring for, the natural world.

Today, however, our relationship with nature appears to be determined more by economics than by religious or philosophical ideas - what can we afford to do (or not to do), what are the costs, and what are the benefits, of the effects of human actions on the environment. No clear answer has been forthcoming. Barbour (1980, p17) states that much present-day environmental degradation "*is in large part the product of decisions by corporations or individuals in the interest of profit or narrowly defined efficiency*". An apparent confidence in human ingenuity and technological progress to provide solutions to environmental problems is sometimes used to justify decisions of this type. Maddox (1972), in *The Doomsday Syndrome*, supports this approach, proposes that science and technology will solve future environmental problems, and additionally expresses the opinion that present-day environmental problems are exaggerated.

Some futurists, for example Krieger (1973), believe further that advances in technology will eventually enable the development of human-made alternatives to natural environments, which will be capable of supporting human life without the presence of "nature". Whether humanity can exist in such a "natureless" artificial environment without undergoing fundamental changes is a matter of speculation. Barbour (1980, p17) describes this human independence from nature "*as the final step of anthropocentrism*".

Commenting on the African peoples of sub-Saharan Africa, Meyer, Moore and Viljoen (1997) state that there are no definite personality theories regarding the peoples of Africa, but add that, just as there are multiple theories based on the Western perspective of personality, so there are likely to be multiple theories applicable to the African peoples. Further, Africans may, at present, possibly be somewhere on a continuum between their own traditions and those of the West.

African thought, intuitive by nature, and oriented against a background of symbols, images, rituals and myths, distinguishes itself from that predominant in the West, and facilitates the development of the African person as part of the universe and as an individual. Meyer, Moore and Viljoen (1997) claim that the worldview of Africans is based on holistic and anthropocentric principles.

Sow (1980) describes three levels of experience of the African person. The *macrocosmos* is God's domain, and also the realm of deceased ancestors. However, God has withdrawn from worldly affairs, and people are now largely responsible for whatever befalls them. The *mesocosmos* is where chance interacts with the actions of spiritual beings, and is the place where "good" and "bad" come from (Sow, 1980). It includes individual and collective experience, as well as the living and non-living aspects of the natural world, such as people, animals, trees and rivers. The *microcosmos* is the realm of individual experience, as well as the effect of this experience on the day-to-day lives of African people. It is influenced by both the macrocosmos and the mesocosmos.

Whereas the role of the self, or ego, is emphasized in the Western way of life, the African peoples tend to derive their sense of being from other people in a community to which they themselves belong, and also from the community itself. Mbiti (1990) states that, to be human, for an African person, is to be part of, and to participate in, a holistic society. This diminished role of the self goes hand-in-hand with the awareness of the interdependency of individual and community. It would appear that the sense of "belongingness" to, and of an interdependency with, a larger whole, of the African peoples, is, in some respects, similar to the way of thinking of the Eastern civilizations, as well as of the North American Indians.

Much of the research into people's attitudes towards the natural environment has taken place in the West, and consequently Western worldviews have not only determined, to a certain degree, the nature of the relationship between people and the environment, but have also influenced the base from which the research has been performed. While other perspectives have been presented, namely, those of the Eastern, North American Indian and black African cultures, far more research has been focussed around the Western perspective than any other. What is apparent, however, is that researchers investigating environmental concern need to take into account different worldviews, both within and across cultures and population groups, as these differences may contribute to fundamental differences in the way people relate to their environment. This is of particular relevance in the South African situation, as differing value systems among the country's different ethnic and language groups may contribute to vastly different worldviews. The implications of this will be discussed in Section 2.3.

2.3 Values, ethics and the natural environment

According to Seligman (1989, p177-178), "*values are essential features of ethical situations that people use to impart meaning to the situation, to evaluate the individuals involved and possible courses of action, and to guide behavior*", while Rokeach (1973, p5) defines a value as "*an enduring belief that a specific mode of conduct or end-state of existence is personally or socially preferable to an opposite or converse mode of conduct or end-state of existence*". Values, as they

relate to the natural environment, are learned through a process of socialization. Personality development, social context, culture and personal experience influence both the values that an individual adopts and their relative importance (Seligman, 1989). It is reasonable to propose that the above factors are likely to vary greatly both between and within South Africa's diverse population groups, contributing to widely differing sets of values.

The concept of environmental ethics is concerned with the intrinsic value of different forms of life, both human and non-human, and the non-living aspects of the natural environment. Examples of environmental values are environmental conservation, wise natural resource utilisation, and wildlife preservation. The situation that presents itself today is that environmental values often conflict with other values; for example, should game reserves continue to be developed when a large proportion of South Africa's population does not have adequate housing. This should not be seen to imply that ceasing to support and develop game reserves would necessarily provide a solution. The country's housing problem is complex and likely to be influenced by a multitude of factors, but nevertheless ethical issues surrounding the conflict between human and environmentally-focussed values remain. The problem is essentially a religious or philosophical one, and centres around the intrinsic value of non-human creatures and non-living aspects of the natural world. The ideal solution would be to bring together environmental values and the values with which they conflict into a set of ethical principles which would serve as guidelines for government strategies, policy decisions and the actions of both organizations and individuals.

In order to understand further the challenge that this represents, and to give some idea of the ethical bases that are used to make decisions regarding the natural environment and to resolve environmental dilemmas, some concepts from normative ethics will be used. *Utilitarianism* is primarily concerned with the usefulness and consequences of actions; *deontology* would assert that other issues besides the usefulness or the "goodness" or "badness" of consequences need to be considered when determining whether a particular action is "right" or "wrong", and places importance on following ethical rules (Seligman, 1989). For example, with respect to

environmental matters, utilitarianism would use the usefulness of a particular action or policy to humankind, including both current and future generations of human beings, to determine whether the action or policy is "right" or "wrong", while deontological principles would not be confined to consequences affecting humankind, but would also extend the concern to non-human life and non-living aspects of the natural environment, for example, consequences for animals, plants and natural resources. Utilitarianism therefore grants moral consideration only to human life, and is **anthropocentric**, that is, it is focussed on people. Deontology extends this consideration to non-human life and the non-living aspects of nature, and is therefore **ecocentric**, that is, focussed on the broader environment as an ecological whole (Bell et al., 1996). Ironically, it is in this extension of moral consideration that conflicts may occur. Also, other factors besides utilitarian or deontological ones contribute to the complexity of the situation. For example, as mentioned by Seligman (1989), political or financial power rather than ethical concern is often a major influencing factor when environment-related decisions are made.

Environmental ethics may be approached from several alternative perspectives. Three salient approaches are mentioned below. The first is to consider the impact of human behaviour on the natural environment in terms of how it affects the well-being of both current and future generations of human beings. The second approach extends this to include the well-being of non-human life, for example, animals, birds, fish and plants, exemplified by the "reverence for life" philosophy. A third approach extends the second, in turn, to include the well-being of non-living aspects of the natural environment, for example, areas of land, mountains, rivers and lakes. (Seligman, 1989).

The first approach above is utilitarian, as only human beings are considered morally relevant. The second and third are deontological, in the sense that moral relevance is extended to non-human life, and to the total environment, respectively.

It is appropriate at this time to consider the impact of human behaviour with respect to the natural environment in terms of responsibility in relation to the three approaches to environmental ethics mentioned above.

From a utilitarian, **anthropocentric** perspective humankind's **responsibilities to current generations** with respect to the natural environment may be viewed in terms of the ability of the environment to satisfy various human needs and wants, for example, survival, health, recreational and aesthetic (Seligman, 1989). Pollution of air, land and water with toxic substances is clearly detrimental to human health, and the wise use of natural resources can be defended in relation to human well-being. Natural areas such as forests, mountains and rivers can have a positive influence on human character, and can be a source of inspiration and spiritual significance that exceeds aesthetic value (Barbour, 1980). An additional reason for preserving the environment is that it provides a natural biological laboratory for researchers to study non-human behaviour in the setting in which it occurs, as well as interactions among members of ecological systems and subsystems. Environmental abuse and mismanagement by humans thus threatens our ability to supply our own needs and wants. Self-interest therefore requires that we protect and conserve the natural environment. Barbour (1980, p81) emphasizes human dependence on the natural world and adds that an anthropocentric approach need not necessarily lead to "*exploitative domination*" of nature by humankind if this dependence is acknowledged. Blackstone (1980), however, points out that, from an anthropocentric viewpoint, preservation of the natural environment is only indirect, being dependent on its ability to satisfy human needs and wants. If an alternative means of satisfying these needs and wants is found, as suggested by Krieger (1973), thus removing humankind's dependence on nature, then the anthropocentric justification to protect and conserve the natural environment breaks down. This speculation does assume, however, that all human beings will be satisfied by whatever alternative is discovered, an assumption which may be neither feasible nor practical.

Another difficulty with the anthropocentric perspective is that it assumes that humans beings always act in their own best interest. The current state of the Earth's ecological systems suggests that this may not be a reasonable assumption.

It is possible to consider whether responsibilities to humans should be extended to include humankind's **responsibilities to future generations**. Philosophical debate concerning whether non-existent persons have rights notwithstanding, it may be argued that current generations have responsibilities to future generations, on the grounds that the latter are potential members of human society, and acknowledging that obligations may reduce for the more distant generations on the basis that their way of thinking and way of life may become increasingly more different from that of the present. At the very least, current generations are obligated to avoid behaviours which are likely to have consequences which are destructive to future generations (Barbour, 1980). Depletion of natural resources and of the ozone layer, may place the well-being of our descendents in serious jeopardy. The period for which nuclear waste remains dangerous to anyone exposed to it, is currently estimated to be between 100000 and 250000 years. It is reasonable to propose that behaviours which contribute to these dangers should be avoided.

It is apparent from the above that responsibilities to future generations are also focussed around an **anthropocentric** approach. This approach, which considers our responsibilities toward current and future generations of human beings, is consistent with the first approach to environmental ethics mentioned above. Whether it is sufficient to preserve the natural environment for anthropocentric reasons or not, there are alternatives which warrant consideration.

The question may be asked as to whether non-human creatures and plants have inherent value, apart from their usefulness to humans, and, if so, what are our **responsibilities to non-human life**. Also, if we do have such responsibilities, do these extend only to the higher forms of non-human creatures, for example, chimpanzees and dolphins, or to all forms of non-human life? Barbour (1980, p89) claims that *"the Biblical idea of stewardship provides a religious justification for respect toward all creatures"*.

It is therefore possible to include ideas from Christianity together with those from the Eastern philosophies in order to substantiate and defend the rights of non-human

life, and in so doing to demonstrate that, from a religious perspective at least, human beings are seen to have responsibilities toward all other creatures. Each type of creature contributes to the well-being or existence of other creatures, and to the balance of the ecological system as a whole.

The philosophical problem of extending moral relevance to non-human life can be taken a step further by considering our **responsibilities to non-living aspects of the natural environment**, for example, areas of land, rivers, mountains, lakes, the sea. These responsibilities can be defended purely from a religious or philosophical viewpoint.

Again, the Christian concept of stewardship over all of creation merges with the ideas of Eastern and North American Indian philosophies to emphasize the interdependence of all members of Earth's ecological communities. Some theorists propose that nature has regulatory mechanisms for maintaining ecological balance, and human beings are duty bound not to detrimentally affect or destroy this balance. Barbour (1980, p94) views *"the integrity of the ecosystem as instrumental to the welfare of individuals, human and nonhuman"*.

This third environmental ethic is based upon **ecocentric** principles, with human beings viewed as only one part of a larger ecological system. The whole and its component parts are considered to be of equal importance.

According to this ethic, the "rightness" or "wrongness" of human actions with respect to the environment is embodied in a statement by Leopold (1949, p217): *"A thing is right when it tends to preserve the integrity, stability and beauty of the biotic community. It is wrong when it tends otherwise"*.

Three environmental ethics have been discussed. The first is anthropocentric, and is in line with the utilitarian Dominant Social Paradigm. The second extends moral relevance to non-human life. A third extends this to all living and non-living aspects of the Earth, and is ecocentric. Changes in ways of thinking exemplified by the New Environmental Paradigm have been mentioned previously in Section 1.1. The

question remains as to whether these changes result from our concern that a deteriorating environment will negatively affect our well-being or our quality-of-life (Seligman, 1989), or from a concern for the environment due to its own inherent value and rights. Nevertheless, this third ethic acknowledges both human and non-human values and provides a basis for treating the natural world with respect, and for evaluating the *"consistency of our environmental actions with our values"* (Seligman, 1989, p169).

Gagnon Thompson and Barton (1994) state that differing value systems motivate people to be concerned about the environment for different reasons. As the various cultural groups within the South African population are likely to have different value systems, they are therefore likely to have different motivations and levels of concern about the environment. Sagoff (1991, p38) says *"even if the love of nature belongs to most cultures, moreover, it might express itself in different ways"*.

In contrast to the emphasis placed on analysis and rational reasoning predominant in the West, traditional African people tend to rely more on intuition and emotion (Pasteur & Toldson, 1982). These researchers propose that Africans' thought is characterised by an achievement of an effective balance between cerebral hemisphere functioning. Left-brain dominance is characteristic of Western thought, explaining the emphasis on the analysis of information, and rational, logical thinking, while intuition and emotions are associated with right hemisphere functioning. It has been proposed, for some time, that differences in cerebral hemisphere dominance, that is, laterality of functioning, may explain differences in ways of thinking of peoples of the East and those of the West (Russel, 1979; Blakeslee, 1980; Bradshaw & Nettleton, 1983).

Mbiti (1990) contrasts the traditional African's experience of time, with that of Western peoples. The latter includes an understanding of past, present and future, while the African peoples tend to conceptualize time in terms of experience. What has been experienced constitutes the past, what is being experienced constitutes the present, but what has not been experienced has very little, if any, meaning to the traditional African. Hence the future, apart from occurrences which are expected to

happen, like the sunrise and sunset, play an inconsequential role in the day-to-day life of the African. To the Westerner, time is associated with a sense of urgency; to an African, time is something that is made when the need arises. Mbiti (1990) describes the African experience of time in terms of "actual" time, namely, time which has been, or is being, experienced, and "potential" time, namely, time which can be made in order for something to be achieved, or to happen, in the short term.

Sogolo (1993) and Senghor (1964) express the opinion that, due to differences such as those mentioned above, the African peoples are possibly thought of as being in some way inferior to their Westernized counterparts, and add that perceived differences are attributable to differences between the Western-oriented way of life and the more traditional way of life, neither of which should be seen to have advantages over the other. Furthermore, the more balanced utilization of cerebral hemisphere functioning of the African might, at least in part, assist in insulating them from the pressures of modern-day life, by providing more innovative solutions to perceived problems than the commonly-accepted Western approach of handling these stressors largely by way of pharmaceutical substances.

With specific reference to South Africa, due to the fact that the country has been in a state of rapid socio-political change for the previous ten years, it is reasonable to suppose that the previously-mentioned statement regarding the transition of traditional African people applies even more so to the black African people of South Africa. Nevertheless, cultural differences with respect to attitudes, values and ethics exist, and are likely to do so indefinitely, to the extent that Buhrman (1984) describes the black African and white African cultures of South Africa as *"living in two worlds"*.

2.4 Environmental concern as a construct

Using Seligman's (1989) and Rokeach's (1973) descriptions of "values" as stated in Section 2.3, it is possible to link values, ethics, beliefs and behaviours, as shown in the conceptual model of attitude formation and expression depicted in Figure 2.3.

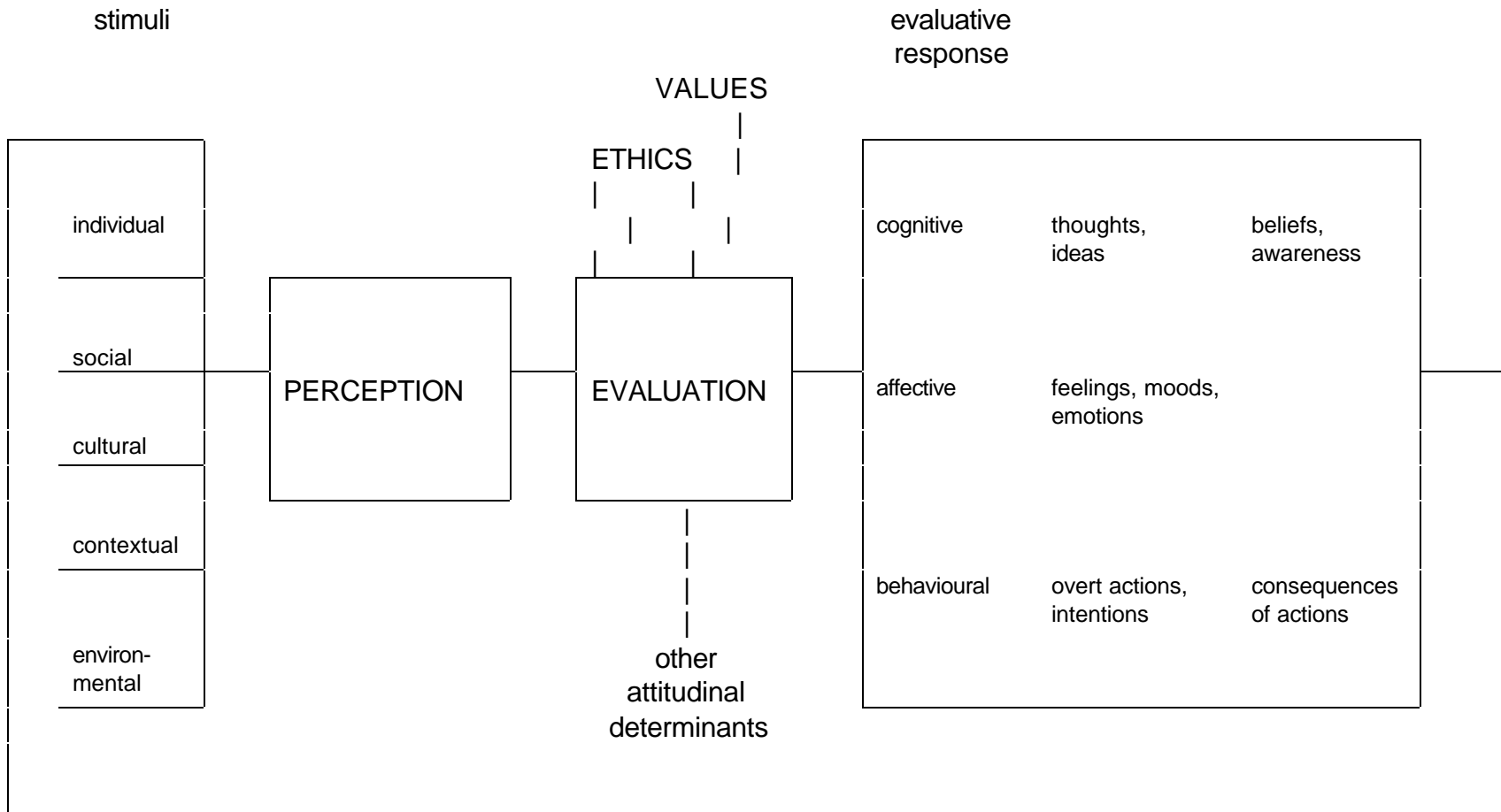


Figure 2.3 Conceptual model of attitude formation and expression indicating the effect of ethics, values and other

possible determinants on the evaluation process

In the above model ethics, values and other possible biographic or demographic determinants of the attitude influence the process of evaluation. The association between cognitive responses and beliefs is extended to "awareness" of the attitude object.

With regard to environmental attitudes, Gagnon Thompson and Barton (1994) state that differing value systems motivate different people to be concerned about the environment for different reasons. Therefore, the role that motives play is proposed to be of central importance in guiding the evaluation process of attitude formation and expression. Accordingly, the evaluative response categories are re-labelled "motivated response categories". Figure 2.4 indicates the central role played by "motives" on the evaluation process of the formation and expression of environmental concern as an attitude.

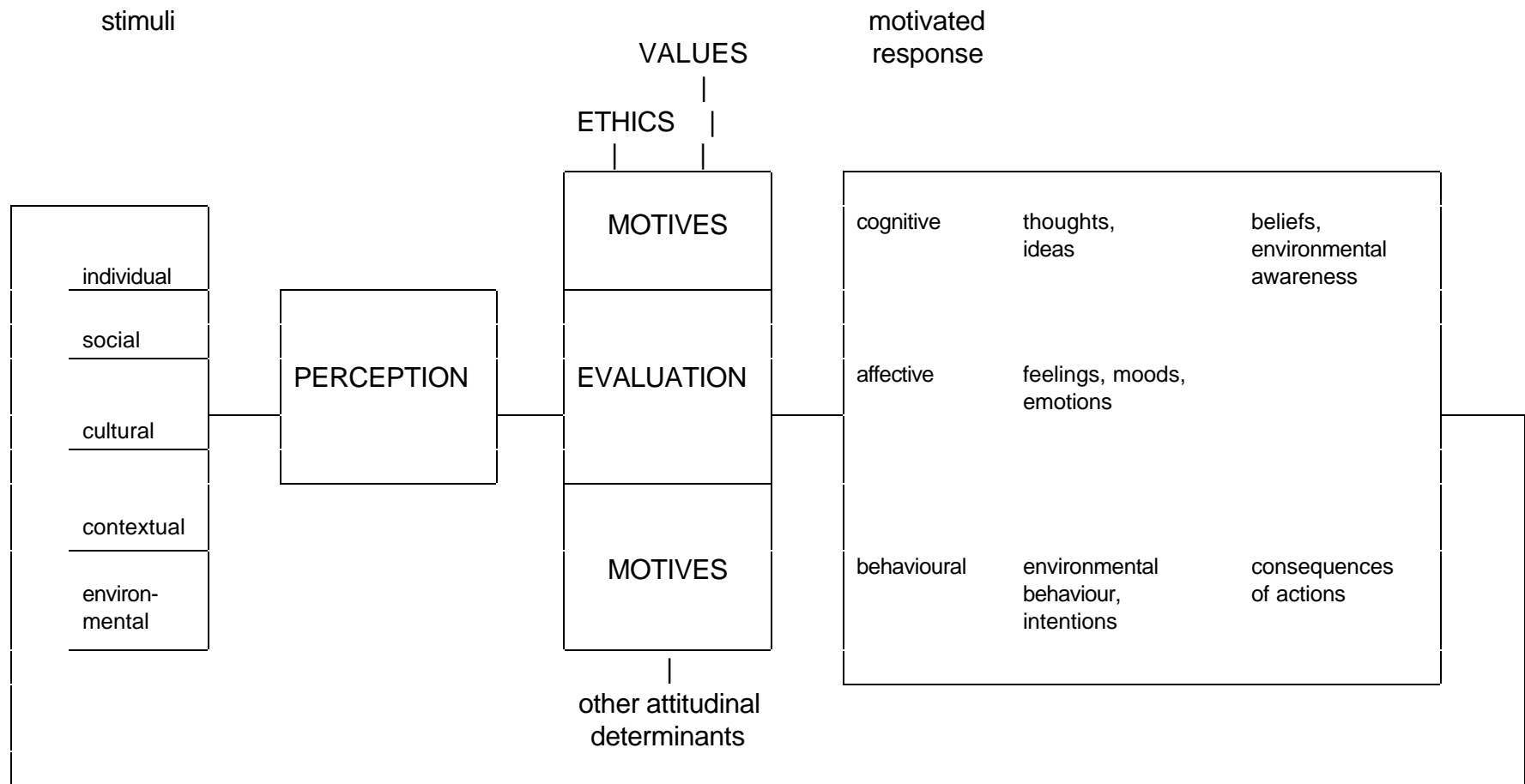


Figure 2.4 Conceptual model for the formation and expression of environmental concern indicating the central role played by motives on the evaluation process

"Awareness" and "overt actions", as shown in Figure 2.3, relate to environmental awareness and environmental behaviour, respectively, as shown in Figure 2.4.

Grob (1995) developed a model of environmental attitudes and behaviour based on the interplay between the following five components: *Environmental awareness* refers to environmental knowledge and the recognition of environmental problems; *emotion* includes the emotional value of aspects of the environment to the individual, and the feelings of concern resulting from the perceived discrepancy between ideal and actual environmental conditions; *behaviour* refers to behaviours which have a direct impact on the environment; *personal-philosophical values* refer to post-materialistic beliefs and an openness with respect to attitudes and attitude change; and lastly, *perceived control* refers to beliefs about the role of science and technology as solution-providers to environmental problems, and also includes the role of self in this regard.

Although the diagrammatic representation of the models differ, four of the five components proposed by Grob (1995), the environmental awareness, emotion, behaviour and personal-philosophical value components, are directly included in the model depicted in Figure 2.4. The perceived control component is also implicitly included in the model, but as a potential influencing factor, it is considered, along with other influencing factors, as belonging to the category of "other attitudinal determinants".

As was the case with the models shown in Figures 2.2 and 2.3, the process of attitude formation and expression depicted in Figure 2.4 is a recursive one. This model allows for the behavioural response category to consist of either overt actions or intentions to act in a manner associated with the natural environment. Furthermore, the temporal relationship between the evaluative response categories is worth consideration. The model proposes that the development of cognitive and affective components, for example, environmental awareness, or emotions relating to the environment, as well as behavioural intentions, occurs prior to the occurrence of any overt behaviour relating to the attitude object. According to this approach, attitude formation is seen as a precursor to relevant overt behaviour. In particular,

the development of environmental concern is seen as a precursor to, and an essential element of, environmentally responsible behaviour.

The model also emphasizes the role that motives play in the formation and expression of environmental concern, in that they provide clues relating to the reasons why people become concerned about the environment, and also why they engage in environmentally responsible behaviour. An understanding of underlying motives may therefore suggest ways of encouraging environmentally responsible behaviour, as well as discouraging environmentally damaging behaviour.

It is important to note that the personal subjective experience of the formation and expression of environmental concern is different for each individual. Also, this subjective experience of environmental concern may change both temporally and spatially. For example, factors such as age and environmental experiences change with time, and place of residence may change. These changes may affect an individual's experience of environmental concern. Therefore, as mentioned by Willers and Van Staden (1998), the formation and expression of environmental concern is a function of space and time.

Willers and Van Staden (1998) propose that environmental concern develops from interactions between individual subjective experience, personal factors, structures at the socio-level, and temporal and spatial structures. Additionally, as suggested by Van Staden (1983), environmental concern at the societal level develops from the collective experiences of environmental concern at the individual level. The expression of environmental concern may therefore be seen to follow from a dynamic process of interactions between various factors at different levels of experience.

2.4.1 A definition of environmental concern

To emphasize the need for a more exact definition, Bamberg (2003, p21) states that the term "environmental concern" is used *"to refer to the whole range of*

environmentally related perceptions, emotions, knowledge, attitudes, values and behaviors".

For the purpose of this research, environmental concern is defined in terms of the concepts contained in the model of environmental concern depicted in Figure 2.4. The following definition is proposed:

"Environmental concern is a psychological tendency developed in a natural environment, and associated feelings of distress or worry, which may be accompanied by supporting behaviour".

2.4.2 The dimensionality of environmental concern

For several decades environmental concern has been an extensively researched construct. Investigators have attempted to identify variables which influence level of environmental concern. This has proven to be a far-from-easy task. The variety and number of independent variables which relate to environmental concern is vast (Buttel & Johnson, 1977), and research results have sometimes been supportive of previous results and sometimes contradictory. Some of this research appears to have treated environmental concern as a uni-dimensional construct, that is, the determination of a single factor, determined in turn by either a single variable or a group of variables, is sufficient to quantify the level of environmental concern. This way of thinking tends to promote the idea that people are either concerned about the environment or they are not, and largely ignores the (possibly different) motives that people may have for being concerned about the environment. Buttel and Johnson (1977, p50) claim that *"environmentalists are not all cut from the same cloth"*, and add that the sometimes supportive and sometimes contradictory research results may originate from the multi-dimensional nature of environmental concern.

At this point the term "dimension" is used rather loosely. As will become apparent, various researchers have approached the investigation and measurement of environmental issues from different viewpoints, and some have employed concepts which may fall into the category of "multiple dimensions", such as

ameliorative/redirective (Buttel & Johnson, 1977), environmental degradation/environmental action/overpopulation (Lounsbury & Tornatsky, 1977), substantive/theoretical (Van Liere & Dunlap, 1981), utilitarian/moral relevance (Seligman, 1989), instrumental/spiritual (Stokols, 1990), attitudinal/self-efficacy/desire for certain outcomes, (Axelrod & Lehman, 1993), egoistic/social-altruistic/biospheric, (Stern, Dietz & Kalof, 1993), anthropocentric/ecocentric (Gagnon Thompson & Barton, 1994), and passive/active (Willers, 1996). A review of a selection of this research follows.

In research involving environmental attitudinal and policy-related interview questions which were administered in 32 Wisconsin communities, Buttel & Johnson (1977) found that environmental concern issues are at least bi-dimensional, and proposed ameliorative and redirective dimensions. These two dimensions focus on two different approaches to solving environmental problems. The ameliorative dimension favours the seeking of solutions within the context in which problems presently occur, for example, financial incentives to encourage more efficient use of natural resources, or technological solutions to reduce pollution. The redirective dimension favours a more radical, aggressive approach to solving environmental problems by challenging the status quo and demanding, in effect, that proper environmental planning be seen as an integral part of industry and society, rather than something to be added on if the need arises.

Axelrod and Lehman (1993) state that past research identifies several factors or combinations of factors which relate to environmentally responsible behaviour, and suggest that these factors may be categorized into three domains: *attitudinal*; *self-efficacy*; and *desire for certain outcomes*. The attitudinal domain focusses on the ability of attitudes to predict behaviour, that is, people act in accordance with their beliefs relating to an attitude object. Self-efficacy refers to people's knowledge or perceived ability to act in accordance with their attitudes, and desire for outcomes refers to the confidence or expectation that actions will produce a desired result.

Willers (1996) investigated the level of environmental concern of South African Asians, Africans, Coloureds and Whites using the Environmental Concern Scale

(ECS) developed by Weigel and Weigel (1978). Two factors were identified: *passive* and *active* concern. *Passive* concern represents a passive attitude towards environmental problems. For example, people with high passive concern feel that pollution should be controlled with the use of laws and regulations, and that nature has a self-regulatory capacity to overcome environmental problems. *Active* concern represents active involvement in, and/or personal responsibility for, the solution of environmental problems.

Willers (1996) proposes that the two categories of concern, namely, passive and active, are indicative of the bi-dimensional nature of environmental concern. The association between the categories of passive and active concern, and an external versus internal locus-of-control, respectively, is evident.

Seligman (1989) distinguishes between two approaches to humankind's relationship with the natural environment. With the *utilitarian* approach the value of nature results from the degree to which it satisfies the needs and wants of human beings. The second approach proposes that non-human aspects of the natural environment have inherent value apart from their utilitarian value to human beings, and therefore they are *morally relevant*.

Likewise, Stokols (1990) suggests two philosophical approaches to human-environment interaction. The *instrumentalist* sees nature purely as a means which humans may use in order to achieve their goals, while *spiritualists* see the natural environment as contributing to the spiritual enrichment of people, and therefore having value independent of its usefulness in facilitating the achievement of human materialistic goals.

Stern, Dietz and Kalof (1993) propose three values, each of which provide a different reason why people may be environmentally concerned. *Egoistic* values relate to the natural environment because of its importance to the self; *social-altruistic* values focus on the natural environment because of its importance to other people; and *biospheric* values focus on the inherent values of all aspects of the

natural environment itself. Egoistic and social-altruistic values have in common the characteristic that they both focus on outcomes for humans.

Gagnon Thompson and Barton (1994) propose a bi-dimensional approach to understanding environmental concern, and suggest that there are (at least) two motives, or reasons, which motivate people to be concerned about the natural environment. Firstly, *"ecocentric individuals value nature for its own sake, and therefore judge that it deserves protection because of its intrinsic value. In contrast, anthropocentrics feel that the environment should be protected because of its value in maintaining or enhancing the quality of life for humans"* (Gagnon Thompson & Barton, 1994, p149).

Gagnon Thompson and Barton (1994) compare anthropocentric and ecocentric motives to the egoistic, altruistic and biospheric values of Stern, Dietz and Kalof (1993), and state that anthropocentric motives are similar to egoistic and altruistic values, and ecocentric motives are similar to biospheric values. Also, the correspondence between *values* as conceptualized by Stern, Dietz and Kalof (1993) and *motives* as conceptualized by Gagnon Thompson and Barton (1994) is apparent.

Mohai and Bryant (1998) note three theoretical perspectives which may provide an understanding of the racial differences in concern for the environment: (i) a hierarchy of needs; (ii) cultural differences; and (iii) environmental deprivation. Dealing specifically with a United States context, these researchers state that the first two of these predict that African Americans (and other people of colour) are less concerned about the environment than are whites, while the third predicts the opposite. Mohai and Bryant (1998) add that each perspective has relevance, and hypothesize that the particular type of environmental concern being investigated determines which is correct.

Recent research by Schultz (2000, 2001) provides evidence which supports the distinction between the altruistic and egoistic value orientations proposed by Stern, Dietz and Kalof (1993). Introducing the concepts of **self-enhancement** and **self-**

transcendence to that of environmental concern, Schultz (2001, p336) proposes that *"self-enhancement reflects a general orientation toward self-benefit and that people who score high on self-enhancement do not define other people or other living things within their boundary of self"*. The effects of the introduction of the concept of self-enhancement (as well as self-transcendence) and its implications for the altruistic/egoistic distinction are the subject of future research.

Each set of dimensions used to conceptualize environmental concern, of which the above are examples, may have a distinct theoretical basis. For example, Lounsbury and Tornatsky (1977) propose that each individual factor which influences environmental concern be considered a dimension of environmental concern, whereas Van Liere and Dunlap (1981) state that groups of individual factors are sometimes combined into multiple-item measures of environmental concern, providing a different conceptualization of the dimensions of environmental concern. This indicates that, just as there is no common definition of the construct environmental concern, the same is true for the concept of "dimension" as it relates to environmental concern.

Recently several researchers have conceptualized a global, more general measure of environmental concern, while still giving cognisance to the existence of local or specific factors (Goeksen, Adaman & Zenginobuz, 2002; Lewis, 2003). In addition, Goeksen et al. (2002) introduce materialistic and post-materialistic thinking as factors influencing environmental concern, and report that people with materialistic values are more concerned about local environmental problems, while people with post-materialistic values show concern for both global and local environmental problems.

While differences in the conceptualization of the dimensions of environmental concern exist, several conceptualizations thereof and related constructs appear to be focussed around the utilitarian and deontological alternatives (Seligman, 1989; Stokols, 1990; Stern, Dietz & Kalof, 1993; Gagnon Thompson & Barton, 1994). The work of these researchers will provide input into the development of a conceptual

model of environmental concern which, it is proposed, will permit environmental concern to be operationalized. The proposed model is described in Section 2.6.

2.5 Research on environmental concern

"Some level of concern for the quality of their physical environment has probably existed for as long as human beings have walked on the earth". So stated Krause (1993, p126). However, it is fair to assume that, at least in part, environmental problems, as they are known today, are a product of the industrial age. Rachel Carson's 1962 book, *Silent Spring* provided an analysis of the detrimental effects of pesticides on the earth's ecology and played a significant role in raising the level of awareness of environmental problems and their associated threats, at least among the more "advanced" Western countries.

In the late 1960's there *"was a growing realization that merely conserving wildlife and natural settings was not enough"* (Dwyer, Leeming, Cobern, Porter & Jackson, 1993, p276). The ability of the earth to remain a sustainable ecosystem, and hence to support life, was threatened by effects such as pollution and the depletion of natural resources.

The increasing interest paid to environmental matters by the field of psychology can be traced to the early 1970's. Wohlwill (1970) proposed that psychologists should become more involved in environmental psychology, while Maloney and Ward (1973) stated that environmental problems are linked to dysfunctional human behaviour and, as such, fall within the realm of psychological investigation. Hardin (1968) had referred to this maladaptive behaviour as the *"tragedy of the commons"*.

Since the late 1960's, various researchers have investigated the nature of human-environment interaction. Holahan (1982, p3) defines environmental psychology as *"an area of psychology whose focus of investigation is the interrelationship between the physical environment and human behavior and experience"*. Research has been directed both towards greater understanding of environmental concern as an attitude, with or without associated behaviour (Feldman, 1988; Scott

& Willits, 1994), and also towards analyzing pro-environmental behaviour directly (Dwyer et al., 1993). In the United States especially, much attention has been devoted to the concept of environmental concern in an attempt to understand its correlates and influencing factors. While most people may have some idea of what environmental concern is, a well-defined, common understanding of the concept has been lacking among researchers. As a result, different underlying concepts may have been researched under the name "environmental concern" and, additionally, aspects which may fall within the sphere of environmental concern may have overlapped with research into associated, albeit related, concepts, for example, environmental quality (Lounsbury & Tornatzky, 1977), environmental responsibility (Borden and Francis, 1978), environmental consciousness (Krause, 1993).

2.5.1 Review of selected research on the correlates of

A considerable amount of effort has been directed towards investigating the nature of the development and expression of environmental concern. Bamberg (2003) categorizes four differing approaches which researchers have employed: (i) the identification of correlating factors of a biographic or demographic nature; (ii) as a function of the potential threats posed by environmental problems; (iii) as an expression of higher-order needs; and (iv) as based on a universal set of values.

Researchers investigating the relationship between **age** and environmental concern have reported differing results. In the United States, while some studies have shown a positive correlation (Samdahl & Robertson, 1989), most research in the last three decades indicates a negative correlation (Tognacci, Weigel, Wideen & Vernon, 1972; Buttel & Flinn, 1978a, 1978b; Mohai & Twight, 1987; Arcury & Christianson, 1990) between age and environmental concern. Jones and Dunlap (1992) report an average correlation of -0.23 between these two entities.

A study indicative of a positive correlation is that carried out by Lyons and Breakwell (1994) in the United Kingdom. These researchers, however, add that caution is needed when interpreting the results, as the age range of their participants was limited, varying only from 13 to 16 years of age.

Klineberg, McKeever and Rothenbach (1998) identify four measures of environmental concern: (i) choices between environmental protection and economic or political interests; (ii) perceived seriousness of pollution; (iii) involvement in pro-environmental activities; and (iv) threats to the global environment. These researchers claim that levels of environmental concern depend greatly on how such concern is measured, and add that age and education are the only demographic variables which are consistently correlated with environmental concern across the above four measures, with younger and more-educated participants exhibiting higher levels of concern.

While most research carried out in the United States indicates a negative correlation between age and environmental concern, South African research tends to indicate a positive correlation.

Grieve and Van Staden (1985) adapted the Environmental Concern Scale (ECS) (Weigel & Weigel, 1978) by performing minor changes to suit South African conditions and translating the modified scale into Afrikaans. Research to investigate the level of environmental concern was conducted on a sample of 2131 white participants, English-speaking participants completing the modified questionnaire and Afrikaans-speaking participants completing the modified and translated questionnaire. Results indicated that adults showed greater levels of environmental concern than adolescents between the ages of 14 to 16 years. Viljoen, Van Staden, Grieve and Van Deventer (1988) speculate that the greater level of environmental concern shown by adults may be attributable to their greater exposure to, and knowledge of, environment-related problems. This would appear to be substantiated by Lyons and Breakwell (1994), who, in a study of 1089 13- to 16-year olds, found that self-reported knowledge about environmental issues was the best predictor of environmentally concerned behaviour.

Reynolds (1992) found that, among white residents of Johannesburg, people between the ages of 18 and 27 years were less positive about the environment than people between the ages of 68 to 70 years were, while, in a study investigating the

perceptions of a total of 2154 African, Asian, Coloured and White South Africans regarding various environmental issues, Craffert and Willers (1994) found no correlation between age and level of concern for the natural environment.

It would seem that there is no clear relationship between age and environmental concern, which suggests the influence of confounding factors. With regard to the South African context, the question may be asked:

Is age related to level of environmental concern in South Africa?

Very little evidence for even a moderate relation between **gender** and environmental concern has been found in studies in the United States. Van Liere and Dunlap (1980) state that correlation coefficients have generally been less than 0.1.

Some studies have shown that females are more concerned about the environment than males (Williams & McCrorie, 1989; Arcury & Christianson, 1993). Research by Blocker and Eckberg (1997) supports this, and extends the findings to include concern for animals. It is possible that the natural caretaker role of some women influences their level of environmental concern either directly or indirectly via experiential behaviour. While other studies have shown the opposite (Arbuthnot & Lingg, 1975; Arcury & Christianson, 1990), some have shown no differences between the level of environmental concern of males and females (Blum, 1987; Roth & Perez, 1989). In the United Kingdom, Lyons and Breakwell (1994) found no gender differences in concern for pollution and the use of chloro-fluoro-carbons (CFC's) in their 13- to 16-year old participants.

Fransson and Garling (1999) state that research investigating the relationship between gender and environmental concern has yielded ambiguous results, while Bord and O'Connor (1997) claim that females show higher levels of concern than males only in relation to environmental matters that involve specific risks, and suggest this as a possible reason for the inconsistent results reported.

Commenting on the effect of adherence to stereotypical gender behaviour on levels of environmental concern, Hampel, Boldero and Holdsworth (1996, p67) say that *"it appears that the psychological correlates of high environmental concern need further investigation"*.

In a South African study, Grieve and Van Staden (1985), using the modified and translated Environmental Concern Scale (Weigel & Weigel, 1978) mentioned earlier, analyzed results by gender and language group, and found that the highest level of environmental concern is shown by English-speaking women, followed by English-speaking men, Afrikaans-speaking men, and Afrikaans-speaking women in decreasing sequence. Further South African research (Reynolds, 1992; Craffert & Willers, 1994; Willers, 1996) found no significant difference in the attitudes of males and females towards the natural environment.

However, Rousseau and Venter (2001) researching the demographic correlates of environmental concern among 340 Eastern Cape participants from the English-, Afrikaans- and Xhosa-language groups, found that gender and age do play a significant role in determining environmental concern.

One can conclude from the Grieve and Van Staden (1985) study referred to above, in which gender was related to language, that the possibility of a significant interaction between factors which relate to environmental concern needs to be investigated.

The following question may be posed:

Is gender related to environmental concern in South Africa?

Research has shown that one of the most consistent correlates of environmental concern and related issues is **level of education**. This is apparent from studies conducted in the United States over a period of more than twenty years (Tognacci, Weigel, Wideen & Vernon, 1972; Buttel & Flinn, 1978a; Blum, 1987; Jones & Dunlap, 1992; Scott & Willits, 1994). For example, in a 1990 study of 3632

participants undertaken in Pennsylvania, Scott and Willits (1994) found that level of education (as well as other social characteristics such as gender, age and income) was a stronger predictor of pro-environmental behaviour than was support for the New Environmental Paradigm (NEP).

However, one study which indicated an opposite relationship was conducted by Samdahl and Robertson (1989) in the United States. These researchers found that Chicago residents with low education levels were more environmentally concerned than those with high education levels.

In a Southern African study of environmental concern among 250 residents from high-, medium- and low-cost residential areas of Gaborone, Botswana, Chanda (1999) found that level of formal education and income level were positively and significantly related to concern for the environment.

South African research investigating the influence of level of education on environmental concern has consistently indicated a positive relationship (Grieve & Van Staden, 1985; Reynolds, 1992; Craffert & Willers, 1994; Willers, 1996). For example, in a study investigating the perceptions of a total of 2154 African, Asian, Coloured, and White South Africans regarding various environmental issues, Craffert and Willers (1994) found that level of education was found to correlate positively with the tendency to regard environmental degradation as a priority.

It is important to distinguish between "education" and "environmental knowledge" - being highly educated need not necessarily imply a high level of environmental knowledge. A National Veld Trust investigation carried out in 1981 showed that the South African population is generally ill-informed about environmental degradation (Adler & Ackerman, 1981), while Craffert and Willers (1994) found that 31.1 percent of a total of 2154 African, Asian, Coloured and White participants did not regard environmental degradation to be a priority in South Africa.

Taking the large variances in level of education of the South African population into consideration, it is reasonable to ask the following:

Is level of education related to environmental concern in South

Afric:

Several researchers have investigated the strength of correlation between environmental concern and related issues, and various demographic factors, and have also compared the correlations of both demographic and non-demographic factors with environmental concern. Baldassare and Katz (1992) studied the relationship between pro-environmental behaviour and participants' age, gender, education, **income**, perception of environmental threat and political affiliation. The results of the study, undertaken in Orange County, California, United States, indicate that perceived personal threat of environmental problems, such as air and water pollution, is a strong and better predictor of pro-environmental behaviour than either demographic or political factors.

In a 1990 study of 3632 participants undertaken in Pennsylvania, United States, Scott and Willits (1994) concluded that, while support for the NEP was significant, the correlation between support for the NEP and pro-environmental behaviour was not strong. Additionally, and in contrast to the study mentioned above, they found that social characteristics such as gender, age, education, **income** and political ideology were stronger predictors of pro-environmental behaviour than was support for the NEP.

Fransson and Garling (1999) discuss a "social-class" hypothesis, stating that environmental concern is positively related to both education and income. This hypothesis is based on Maslow's (1954) hierarchy of needs theory, which when applied to this instance, would imply that, as the basic needs of middle- and upper-class members of a society have been satisfied, they are able to consider higher-order needs.

In a South African study, Craffert and Willers (1994) found that monthly **income** correlated positively with the tendency to regard environmental degradation as a priority. These researchers add that higher educational levels and higher income tend to represent the white population group, and substantiate the perception that, in

general, the quality of life of people influences their attitudes towards the natural environment.

As described in Section 4.2, this research will be conducted using participants who are employed, therefore a question relevant to the South African situation is:

Is income level related to environmental concern in South Africa?

With respect to **ethnic group** (racial group), studies in the United States have mostly been inconclusive. In cases where a relationship has been found, this has tended to indicate that environmental concern is a higher priority among white Americans than among other ethnic groups. For example, Taylor (1989) showed that white Americans are generally more concerned about environmental issues than Afro-Americans, while research conducted in Florida State by Hershey and Hill (1977-78) showed that Afro-American children consider pollution and environmental quality to be less serious problems than their white counterparts do.

It is reasonable to differentiate the South African population into four ethnic groups, as follows: African, Asian, Coloured and White. The country has eleven official languages, with Afrikaans or English being the primary **home language** of Asians, Coloureds and Whites, and one of the remaining nine being the primary home language of the African peoples. In the case of, for example, South African-born people whose parents or grandparents may speak another language in the home environment, in which the participants themselves may be fluent to various degrees, for example, Arabic, Gujarati, Cantonese, it would appear that in most cases English is considered, for practical purposes, to be the home language. For the purposes of this research it was decided to proceed on this basis.

A South African study by Craffert and Willers (1994) found that 55.4 percent of Africans, 67.2 percent of Asians, 70 percent of Coloureds and 93 percent of Whites regarded environmental degradation in South Africa to be a priority. These researchers concluded further that ethnic group correlated significantly with concern for environmental degradation.

Willers (1996) investigated the interacting predictors of environmental concern in South Africa using two sets of participants (a 1991 and 1992 set) comprising the four ethnic groups mentioned above. Ethnic group was found to be the only predictor occurring in both the 1991 and 1992 samples and in both the active and passive categories. Education and gender were predictors in both samples, but the former only in the passive category, and the latter only in the active. Home language was a predictor for both active and passive categories in the 1991 sample only, while age was a predictor only for the active category in the 1991 sample.

In addition, Willers (1996) found that black Africans were more concerned about environmental problems which affect their lives personally, while the other ethnic groups considered both global and local problems, which may not affect them personally, to be more serious.

It was mentioned earlier that Grieve and Van Staden (1985) found that English-speaking women show the highest level of environmental concern, followed by English-speaking men, Afrikaans-speaking men and Afrikaans-speaking women. Viljoen et al. (1988) speculate that language differences in level of environmental concern may be attributable to Afrikaans speakers, in general, having a more conservative socio-political orientation than English speakers. These researchers, however, do not exclude the possibility that inter-group differences may be associated with differences in level of environmental awareness. (Note that, in general, differences in level of environmental awareness between groups can be hypothesized to contribute to differences in level of environmental concern).

Research by Rousseau and Venter (2001) carried out with a sample of 340 participants from the English-, Afrikaans- and Xhosa-speaking language groups in the Eastern Cape Province of South Africa found that home language (and suburb of residence) were important factors in determining the level of environmental concern of the participants.

A study carried out in the Gauteng Province of South Africa by Van Staden, Willers, Craffert, Marais, Fiedeldey and Fiedeldey-van Dijk (2003) using 13 environmental issues of concern developed by Pawlik, Ajaegbu, Kagitci, Nosulenko, Sinha and Stern (1996) indicated that English- and Afrikaans-speaking participants showed more concern than their Zulu- and South Sotho-speaking counterparts. Furthermore, a principal component factor analysis showed that the participants' concern constituted *"one general factor, of global environmental concern"* (Van Staden et al., 2003, p28).

South African research results seem to substantiate the statement that, as mentioned in Section 1.4, many South Africans have concerns which are more basic than environmental ones. People of lower socio-economic status (SES) and low environmental awareness may have low levels of environmental concern. One may speculate whether, as the level of environmental awareness increases, low SES people may become more concerned about the natural environment as a consequence of comparing their situation with those more fortunate than themselves, possibly for egocentric reasons, while those of higher SES may do so for either egocentric or ecocentric reasons.

Section 2.3 highlighted the role that **values** play in the formation of attitudes and consequent behaviour. This idea will be expanded in the model of environmental concern described in Section 2.6. South Africa's various ethnic groups have differing cultural backgrounds, and, due to differences in cultural archetypes, socialization and experiential learning, the possibility of significantly different value systems (and therefore different attitudes and behaviours) between ethnic groups cannot be overlooked. Acknowledging language as a subclass of ethnic group, the following questions may be asked:

Does environmental concern vary among different ethnic groups in

and

Does environmental concern vary among different language groups

The above six highlighted questions form part of this research. Nevertheless, it is important to consider other factors which may influence, directly or indirectly, or correlate with, environmental concern, in order to control these factors during the selection of participants, and to minimize systematic variance (Kerlinger, 1992).

Some examples of research into environmental concern which indicate the existence of additional influencing factors, for example, locus-of-control (Tucker, 1978), introversion/extraversion (Borden & Francis, 1978) which need to be controlled, are presented below. In addition, some further examples are presented which indicate the interaction of variables and the sometimes contradictory nature of the research results.

In a study investigating the effect of personality and gender differences on environmental concern, Borden and Francis (1978) found that people having high levels of environmental concern have higher value orientation, person orientation and ethical conscientiousness than those having low levels of environmental concern. These researchers also found that high environmental concern females were significantly more extraverted than low environmental concern females, while the opposite was true for males. They concluded that men and women who show high environmental concern may do so for different reasons.

In a Norwegian research study Bjerke, Reitan and Kellert (1998) found that farmers, rural inhabitants, older people and those with lower levels of education express negative attitudes to predatory animals like wolves, while younger, better educated, urban people expressed more positive attitudes. Bjerke and Kaltenborn (1999, p415) add that *"negative attitudes toward large predators are most typically found in groups whose economic interests are provoked by these animals"*.

In recent years a number of private game lodges have been established in South Africa. These lodges are places of residence of both carnivorous and herbivorous wildlife. Of interest is the fact that one of the reasons offered to support the existence of many of these lodges is that they provide a means of controlling animal population

numbers, thereby ensuring the survival of the species and at the same time preventing the destruction of the natural environment, by permitting the hunting of "overstocked" animals. The owners/operators of these lodges gain a financial reward from these activities as well as from the provision of tourist accommodation, and may express more positive attitudes to wildlife out of self-interest in addition to conservation reasons, an example of behaviour that may result from very different reasons.

In a study investigating the level of environmental consciousness among 293 Americans living in a metropolitan area, Krause (1993) found that 57 percent consider themselves to be environmentalists. Other researchers have found this to be even higher. For example, according to Gallup (1991), 75 percent of Americans consider themselves to be environmentalists. While there appears to be general support for environmentalism, at least in the United States, some factors have been found to be inconsistent. For example, Krause (1993) found consistency across age, gender and ethnic group, while Fortman and Kusel (1990) found females to be more supportive of environmentalism than males. Also, some researchers have found that environmentalism does not vary along demographic lines (Krause, 1993; Oskamp, Cameron, Lipsey, Mindick & Weissbach, 1991), others have found some socio-economic differences (Mohai & Bryant, 1992).

In an international study involving participants in New Mexico, United States and KwaZulu Natal, South Africa, Marlow and Van Rooyen (2001) found that 52 participants out of 200 selected from a list of KwaZulu Natal social workers registered with the South African Council for Social Work exhibited a lower level of environmental awareness than their New Mexican counterparts, which these researchers attribute to a narrower view of who should be involved in environmental issues.

Willers (1996) found that black Africans were more concerned about environmental problems which affect their lives personally, while the other ethnic groups considered both global and local problems, which may not affect them personally, to be more serious.

Recently several researchers have conceptualized a global, more general measure of environmental concern, while still giving cognisance to the existence of local or specific factors (Goeksen, Adaman & Zenginobuz, 2002; Lewis, 2003). In addition, Goeksen et al. (2002) introduce materialistic and post-materialistic thinking as factors influencing environmental concern, and report that people with materialistic values are more concerned about local environmental problems, while people with post-materialistic values show concern for both global and local environmental problems.

The following research is indicative of the expediency necessary when selecting hypothesized correlating variables as well as the degree to which such variables need to be specifically defined. Syme, Nancarrow and Jorgensen (2002) extended the urban versus rural distinction for place of residence into one that included the physical and social characteristics of (urban) neighbourhoods, while Goeksen et al. (2002) introduced the concept of geographical proximity to environmental problems. Teisl and O'Brien (2003) found that participation in outdoor recreational activities is positively associated with environmental concern. However, different instruments measured the relative effects of different activities differently, prompting the implication that the nature of the outdoor activities may need to be more specifically defined (and standardized across measuring instruments).

The above also highlights the general implication that participants must understand and interpret items on measuring instrument/s as the researcher intended, otherwise there is a risk of measuring different constructs. Willers (1996) states that the researcher should give specific attention to which items best represent the construct under investigation and that these items must encompass the participants' conceptualization of the construct.

As can be seen from the above, it is reasonable to assume that factors which correlate with environmental concern may themselves be correlated, for example "level of education" and "income". For the purposes of this research, interactions between independent variables will be handled as described in Chapter 4.

2.5.2 Environmental attitudes and behaviour correspondence

Fishbein and Ajzen (1975) proposed initially that there would be a high degree of correspondence between behavioural intentions and actual behaviour, that is, between attitude and behaviour. However, with regard to the natural environment, it has been fairly common for researchers to find that environmentally responsible behaviour does not always accompany a high level of environmental concern. Two examples follow.

Lounsbury and Tornatzky (1977) commented that very little empirical research had been carried out in the field of environmental quality assessment. These researchers investigated the relation between people's attitude towards environmental quality and supporting behaviour. While a significant attitude-behaviour relationship was found, verbal commitment was found to be higher than behavioural commitment.

In a 1990 study of 3632 participants undertaken in Pennsylvania, United States, Scott and Willits (1994) concluded that, while support for the New Environmental Paradigm (NEP) was significant, the correlation between support for the NEP and pro-environmental behaviour was not strong.

The relation between attitude as a precursor to behaviour and actual behaviour is worth consideration. It is reasonably well accepted that attitudes are not always reliable predictors of behaviour (McGuire, 1969; Wicker, 1969; Ajzen & Fishbein, 1977). For example, being concerned about the environment does not necessarily mean that a person will behave in an environmentally concerned manner. Behaviour may be inconsistent with the attitude, and multiple behaviours relating to the same attitude object may be inconsistent among themselves. The attitudinal model depicted in Figure 2.2 not only considers overt behaviours, but also behavioural intentions, namely, the intention to act in a manner consistent with the attitude, as part of the behavioural component of an attitude. As proposed by Chaiken and Stangor (1987), several factors, for example degree of perceived control, appear to influence behaviour directly, without involving behavioural intentions.

Attitude-behaviour inconsistency often tends to occur when using general measures of an attitude to predict specific single behaviours (Newhouse, 1990). Nevertheless, it is worthwhile investigating the conditions under which a reliable link between attitude and behaviour may be found.

Firstly, the attitude (and the behaviour) may be defined more specifically, for example, being concerned about endangered wildlife is likely to be a more reliable predictor of behaviour which protects wildlife than is the more general attitude of being concerned about the natural environment. This may not be an applicable, or practical, option for the researcher investigating an attitude which is, by its nature, fairly general.

Secondly, as mentioned by Newhouse (1990), groups of multiple behaviours tend to be more highly correlated with associated attitudes than individual behaviours are.

Thirdly, the more personally relevant the attitude object is to an individual, the higher the correspondence between attitudes and behaviour with respect to the attitude object (Newhouse, 1990).

Fourthly, there is some evidence to indicate that attitude-behaviour correspondence increases when direct experience, relative to the attitude object, contributes significantly to attitude formation (Fazio, Chen, McDonel & Sherman, 1982).

Fifthly, according to Ajzen and Fishbein's (1980) "Theory of Reasoned Action", attitude-behaviour correspondence increases when there is a direct relationship between attitude and behaviour.

Lastly, there is evidence to suggest that perceived control influences attitude-behaviour correspondence (Ajzen & Madden, 1986). Grob (1995) concurs, and adds that studies which have indicated a positive relationship have involved participants with very similar background variables, and referring specifically to behaviour related to the environment, suggests that socio-economic status may be a

mediating variable between perceived control and environmentally responsible behaviour.

Tarrant and Cordell (1997) refer to the different conceptualizations of environmental concern as an attitude, and propose that these account for variations in the measurement of environmental concern as an attitude, which, in turn, may affect the degree of attitude-behaviour correspondence. These researchers add that the use of specific versus general measures, as well as socio-demographic variables and personality factors, may also be contributing variables. While a concerned attitude might not always lead to environmentally responsible behaviour, it seems fair to reason that environmentally responsible behaviours which have already manifested follow from a concerned attitude, that is, environmentally responsible behaviour is a function of a concerned attitude.

It would appear that there is no definitive relationship between attitude and behaviour, but, in the least, the relationship is influenced by the interaction of several factors (Willers, 1996).

Section 5.1 describes the applicability of the above to the selection of statements used in the development of the measuring instrument.

2.5.3 Summary

It can be seen that environmental concern has been researched in relation to (i) individual factors such as age, gender, level of education, ethnicity, socio-economic status and political affiliation; and (ii) people's perceptions about what constitutes the natural environment and whether it should be preserved, the factors affecting it, and actions which are considered appropriate, for example, perceived threat of pollution, support for environmental organizations and the establishment of wildlife sanctuaries. As can be seen from Section 2.4.2, some researchers have categorized factors such as the above into "dimensions", with each set of dimensions possibly having a distinct theoretical basis, for example, ameliorative/redirective (Buttel & Johnson, 1977), instrumental/spiritual (Stokols,

1990), egoistic/social-altruistic/biospheric (Stern, Dietz & Kalof, 1993), passive/active (Willers, 1996).

One may speculate about whether a unique set (or subset) of factors or dimensions is necessary to quantify environmental concern fully. The approach used in this research with regard to the dimensionality of environmental concern is described in Section 2.6. What is also evident from the research is that appropriate behaviours do not always accompany an attitude of environmental concern.

2.6 A model for environmental concern

The **anthropocentric** and **ecocentric** motives (Gagnon Thompson & Barton, 1994) may be conceptualized as two different dimensions of environmental concern, in that they provide two distinct classes of concern about the natural environment. As mentioned in Section 2.4.2, these dimensions are similar to concepts used by other researchers, for example, anthropocentrism shares common ground with the utilitarianism of Seligman (1989), the instrumentalism of Stokols (1990), and the combined egoistic and social-altruistic values of Stern, Dietz and Kalof (1993); while ecocentrism stands similarly with regard to the moral relevance of Seligman (1989), the spiritualistic alternative of Stokols (1990), and the biospheric concept introduced by Stern, Dietz and Kalof (1993). What Gagnon Thompson and Barton (1994) have managed to emphasize is the role which **motives** (and **values**) play with respect to the dimensions of environmental concern. While both ecocentrics and anthropocentrics are concerned about the natural environment, their motivation for expressing this concern is different. These differing motivations are related to differing underlying value systems.

Anthropocentrics express concern for the environment because of its utilitarian value. Ecocentrics express concern because of the intrinsic value and moral relevance of the non-human aspects of the natural world. Nevertheless, Gagnon Thompson and Barton (1994, p149) add that *"Ecocentrics will probably agree with anthropocentrics that ecological issues should be addressed so that health and quality of life can be preserved - the difference is that ecocentrics feel that even if*

these were not issues, nature is worth preserving because of the transcendental dimension".

Gagnon Thompson and Barton (1994) add that the ecocentric-anthropocentric distinction provided new insight into the dimensions of environmental concern, as well as introducing the idea that **motives** and **values** underlie attitudes towards the natural environment. Concern for the environment based on its intrinsic value has different implications for environmental behaviour than concern based on utilitarian principles, and also provides different perspectives for the encouragement of environmentally responsible behaviour.

Background information concerning the Stern, Dietz and Kalof (1993) additive model and the anthropocentric-ecocentric dimensions proposed by Gagnon Thompson and Barton (1994) is relevant.

The Stern, Dietz and Kalof (1993) model was strongly influenced by Schwartz's norm-activation theory (Schwartz, 1968a, 1968b, 1970, 1977), and value theory (Rokeach, 1973).

In terms of value theory, (Rokeach, 1973), attitudes can result from value orientations relating to attitude objects. Norm-activation theory, (Schwartz, 1968a, 1968b, 1970, 1977), proposes that a person's behaviour depends on his or her awareness of consequences (AC) that are relevant with respect to the particular value orientation. For example, a person who is aware of the adverse consequences of environmental destruction is likely to act in a manner which prevents, or does not contribute to, such destruction. The person develops an appropriate personal norm, and becomes morally obliged to act in a manner which is consistent with this norm.

Using Schwartz's theory it is possible to view environmental concern as altruistic, that is, concern for the environment results from a value orientation towards the welfare of other human beings. In this case environmental concern is indirect. Stern, Dietz and Kalof (1993) called this the **altruistic** value orientation, and add the other value orientations: **biospheric**, reflecting concern for non-human life and the

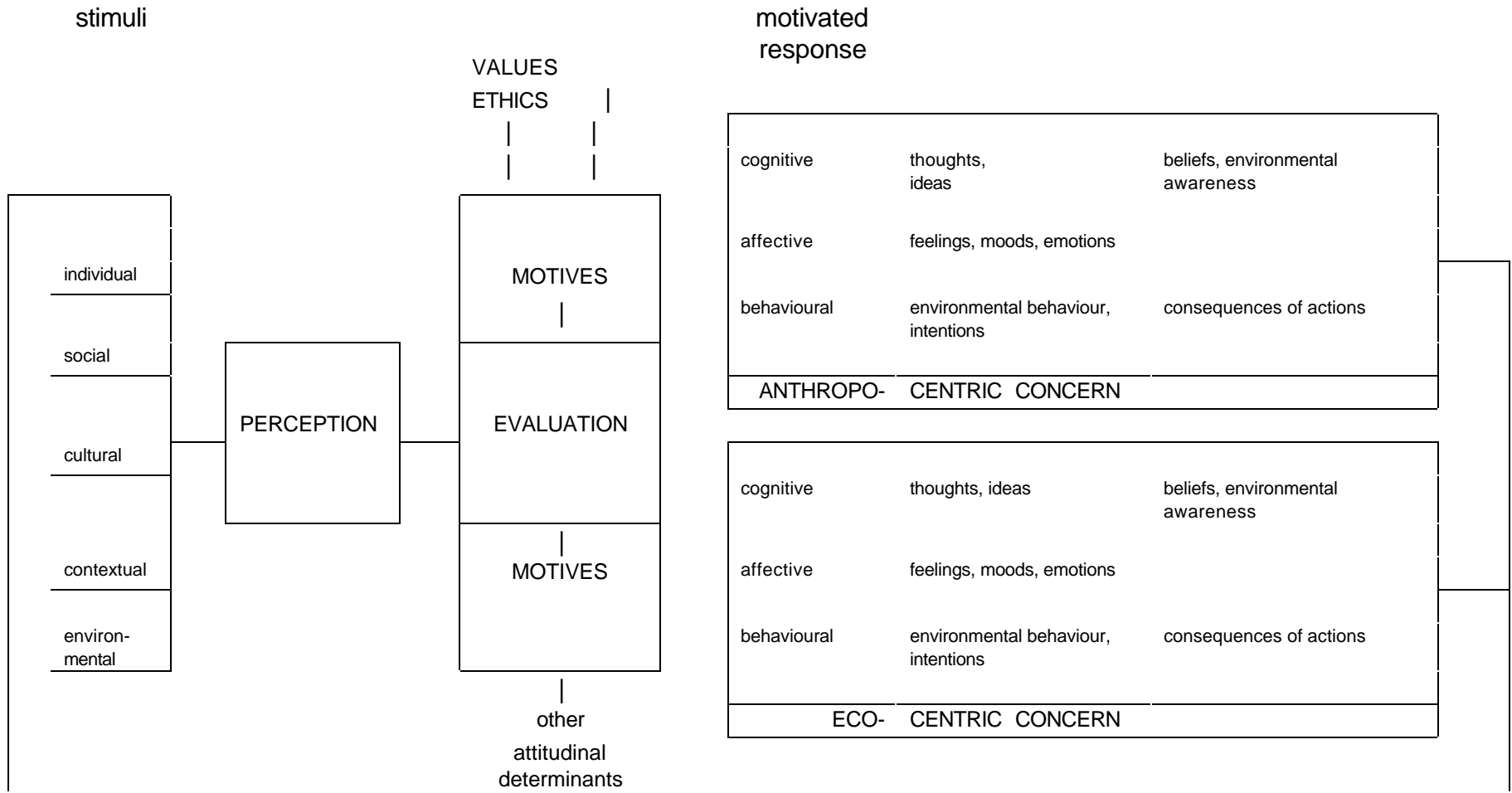
biosphere; and **egoistic**, reflecting concern which results out of self-interest. The model proposed by these researchers is as follows:

$$M = V_{alt}AC_{alt} + V_{bio}AC_{bio} + V_{ego}AC_{ego}$$

where M: motivation to act in an environmentally concerned manner
 V: weight (importance) of the respective value orientation
 AC: awareness of adverse consequences in relation to the respective
 alt: altruistic value orientation
 bio: biospheric value orientation
 ego: egoistic value orientation

As mentioned in Section 2.4.2, Gagnon Thompson and Barton (1994) combine the above altruistic and egoistic value orientations into one **anthropocentric** "motive" or value orientation, and view the biospheric value orientation as an **ecocentric** "motive" or value orientation. This is the approach adopted in this research, that is, the anthropocentric and ecocentric value orientations will be investigated in relation to each being one of two dimensions in terms of which the construct environmental concern may be defined and measured. Note that a further justification for combining the altruistic and egoistic orientations is obtained from the following statement by Barbour (1980, p93) *"Some people find personal fulfillment in the welfare of other persons with whom they identify themselves, and the distinction between egoism and altruism breaks down ..."*.

The conceptual model for the formation and expression of environmental concern as a bi-dimensional construct is presented in Figure 2.5. It is based on the general model of the formation and expression of environmental concern as an attitude shown previously in Figure 2.4, and can be applied according to either the additive or the averaging approaches described in Section 2.1.1.



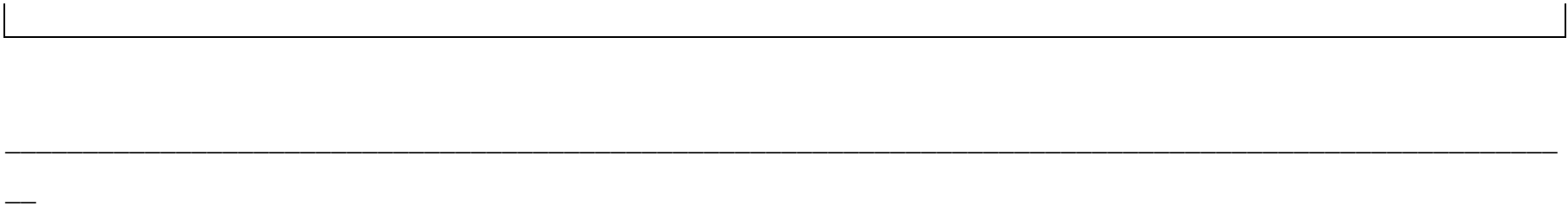


Figure 2.5 Conceptual model for the formation and expression of environmental concern as a two-dimensional construct