

## **Roles of Awareness and Intention in Determining Levels of Environmentally Positive Action: A Review of Studies**

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### **Abstract**

While it is generally accepted that understanding people's knowledge and attitudes towards the environment and their actions is an important step in establishing effective policies for sustainable development, there is still limited clarity in defining the nature or makeup of the relationship between them. This paper presents a broad picture of the studies done with regard to awareness of environmental issues; attitude towards and intention to carry out positive environmental action; and the actual behavior of various parties towards the environment. It considers the individual factors often attributed to increased awareness, and also a number of studies and socio-psychology theories which attempt to find and explain correlations between these factors, both individually and collectively, and participation. We will see that while there may be no definitive correlations, these studies are useful in highlighting key factors that impact participation. Finally, the complexity of the relationships that they reveal suggest grass-root led policies might be more suited to addressing local variations reflected in the factors that most effect, or indeed may be holding back effective participation.

**Keywords:** environment, sustainable development, policy, stakeholders, altruism, cultural factors, social factors, socio-psychological theory

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## Introduction

Since the 1987 report *Our Common Future* placed sustainable development as a key component of the global political agenda, there has been a slow but steady increase in the attention given to multi-stakeholder and local level participation, and with these, the importance given to awareness-building, empowerment, and capacity building. In particular, the Earth Summit's Local Agenda 21 helped create a framework for public participation and in institutionalizing sustainability in every level of government (Barr, 2004). It is reasonable therefore, to assume that the higher profile given to the environment and sustainable development has also been accompanied by significant increases in the levels of information and awareness of environmental issues.

However, despite two decades having already passed since the 1987 report, in strong contrast to the elevated position sustainable development has enjoyed, is the fact that rapid deterioration of the environment has continued, and seems more than ever, to be the most significant threat to our health, well-being, and security (UNEP, 2007). Indeed, in the UNEP's fourth Global Environmental Outlook report (GEO-4), analysis showed that most areas of the earth were still experiencing "rapidly disappearing forests, deteriorating landscapes, polluted waters and urban sprawl" (UNEP, 2007, p. 34) and "urgent action" is being called for, for there to be any chance of attaining the Millennium Development Goals (MDG's) by 2015.

Although studies have shown that understanding peoples' knowledge and attitudes about the environment, and their actions towards it, is fundamental to establishing effective sustainable policies (Sudarmadi et al, 2001), so far, they have been largely inconclusive in coming to a definitive relationship between the two. For instance, while Ramsey et al (1992) showed that awareness was a key determinant in helping people to act more environmentally, Brand (1997) among others, suggest that environmental knowledge is not necessarily correlated to environmentally friendly action. So while most agree that awareness, attitude, intention, and action are all important aspects with respect to developing sound sustainable development policy and frameworks, the challenge of unraveling the complex relationship that seems to exist between them, is reflected in the high number and range of studies being done in this area (for example; Barr, 2004; Barr, 2006; Easton et al, 1998; Sabah ,2008; Win, 2001).

It is not surprising therefore that while participation among the public has been accepted as a key factor for effective sustainable development policy-making, there still exists fundamental problems with current governance systems in terms of translating rhetoric into the levels of participation needed. These include a lack of law enforcement, particularly at a global level, and a continued influence on the contemporary belief that economic growth will pay for technological advances and improved policy and regulation to reduce environmental impacts (Iizuka, 2000) despite studies (for example; Fujisaki et al, 1997) which have shown that countries

which already have the resources in place, still experience deteriorating environments.

Whether local, national, or global – a lack of participation, in light of fundamental changes brought about by globalization, is now a more crucial prerequisite for effective change than ever before. In particular, changing patterns of consumption have led to suggestions that participation among the public (i.e. consumers) is important because it might be the most effective way in helping to address enforcement capacity issues. This is because with the radically different scale and pattern of consumption the world economy is now experiencing, environmental problems now emanate from consumption rather than, as in the past, production methods and processes, which in turn, puts the focus for change more in the hands of the consumer. In addition, increased participation is also seen as a means to making the legal and economic changes necessary for successful sustainable development policy making more acceptable (Iizuka, 2000).

The main aim of this paper is to get a broad picture of the studies done with regard to three main aspects associated with participation; awareness of environmental issues; attitude towards and intention to carry out positive environmental action; and the actual behavior of various parties towards the environment. Before looking at the main study trends connected with the area of investigation undertaken in this paper, it will be useful to clarify the terms 'awareness', 'attitude', and 'intention' because their use often overlap in discussions surrounding behavioral studies in connection with environmental issues.

### **Awareness, attitude, and intention**

It seems that in many discussions or reviews on environmental 'awareness', results can be described under a range of terms that include; attitude, opinion and concern. Iizuka (2000) helps shed light on their relative meanings to each other when he points out that in the 25 years after 1965, opinion surveys showed that environmental 'concerns' had manifested themselves to become an environmental 'attitude' which formed as a result of temporary 'opinions'. Despite this useful distinction between the three terms it seems that the majority of studies mentioned in this paper's literature review, generally refer to peoples 'attitudes' as an encompassing term for all three.

While there is a general assumption that giving information and knowledge – i.e. awareness – about an issue affecting a community should result in enlightened attitudes (Maddock and McDonald, 1982), Young (1980) warns that knowledge and attitude may not necessarily be positively correlated. There is also the general assumption that attitudes are a significant predictor of behavior. However, although Fishbein and Ajzen (1975) acknowledge that the centrality of 'attitude' remains unchanged with regard to behavioral studies, and comment that there is "little agreement about what an attitude is, how it is formed or changed, or what role, if any, it plays in influencing or determining behavior" (Fishbein and Ajzen, 1975, Preface). Lucas (1980) also questioned the value of attitude in relation to

environmental education and concluded that studies need to focus on the effects on behavior and not only on attitude. Indeed, as another reflection on the overlap between these two terms, Iizuka (2000) points out that many studies into attitudes are in fact based on 'opinion' surveys.

For the purpose of this paper, unless otherwise stated, the word 'attitude' will be taken to mean opinion or a way of thinking and will at times be used synonymously with concept of 'intention'. In this respect, they are both terms used in behavioral studies to refer to peoples' way of thinking towards the environment. While keeping all these terms in mind and remembering that they are often used in a general rather than literal sense, we will now look at some of the main studies connected with awareness, intention and behaviour towards the environment.

### **Studies into peoples' environmental awareness, attitudes and concern**

Time series results on public opinion about environmental issues show a general increase in interest from the 1960's through to the 1990's (Iizuka, 2000). Erskine (1972) for example, showed there to be a rapid increase in concerns for the environment in the US during the period 1965 to 1970. Studies in the 1980's and 1990's also show continued increases in concern (for example, Gillroy & Shapiro, 1986; Dunlap, 1991; Dunlap & Scarce, 1991). In 1990, a nationwide survey in the US showed that 71% of respondents thought too little was being spent on environmental protection. Only 4% though, thought the amount was too much (Dunlap, 1991). Multi-national studies on opinions (Harris and Associates, Inc, 1989) show similar results that indicate a global attitude of Governments, organisations and the general public that suggests a greater willingness or intention to act positively towards solving environmental problems. Similarly Dunlap, Gallop and Gallop (1993) surveyed members of the general public in countries from the North and the South, and found that there had been a general increase in concerns for environmental issues.

Although these studies may suggest increases in concerns among the public, they do not show the extent these increases are directly correlated to actions and behavioural changes. Dunlap and Scarce (1991) concluded therefore, that more work was needed to establish the extent attitudes result in pro-environmental actions. Indeed, changes in behaviour, which might appear as more environmentally friendly, do not necessarily mean a more environmentally conscious or concerned actor. If we were to compare Japanese peoples' actions and attitude towards energy conservation, pre and post the Fukushima Nuclear disaster in March 2011, there would undoubtedly be a significant increase. However would this be a fair reflection on how aware they are of environmental issues and the need for significant lifestyle change? Arguably no. While most Japanese are now making great efforts to save energy, the government included, it is only in direct response to avoiding power cuts while the majority of the nations nuclear reactors are offline, and are actions that have no genuine connection to environmental awareness to issues such as climate change, transparency, democratisation of power generation etc. So defining what constitutes

environmental awareness itself adds further complexity of finding causal relationships between awareness and action.

Before looking at some studies, which do indeed investigate possible causal links or predictors between environmental awareness and action, we shall first look at studies into the factors effecting awareness itself.

### **Socio-demographic variables**

Many studies that have considered different causes for levels of environmental awareness have looked for influences from so-called situational or demographic variables and while a number (for example; Hines et al., 1987; Schultz et al., 1995) suggest the stereo-typical environmentalist as being young, well-educated, wealthy, liberal women, the effects of socio-demographic variables are by no means clear. While such factors include change in life style, public action and degree of globalisation and consumerism, we shall now look in turn at the most common variables that appear in studies; Age, Economic development, Political Ideology, Gender, Values and Worldview, and Culture.

Numerous studies have shown an apparent correlation between age and awareness that suggest awareness or concern for the environment lessens as one gets older. Many of these studies (for example, Hornback, 1974, quoted in Mohai & Twight, 1987) conclude that this dominant effect of age is the result of the ageing process whereby peoples' views are moulded by their changing responsibilities and position in society as they mature and is most often expressed as imply a more conservative stance. In contrast, others (for example; Inglehart, 1990; Van Liere and Dunlap, 1980a) see the effects of age on the level of concern for the environment as the result of generational differences, known as the "cohort effect", whereby differences in views between generations are explained by the historical events that occurred during that generations' earlier years. For example the generation in the UK who experienced rationing during and after World War II could be expected to be more 'thrifty' than today's young generation. As Lizuka (2000) points out however, although many studies suggest a link between age and environmental awareness, some studies such as Furman (1998) show only a weak correlation between the two.

In line with the graphical U-shaped Environmental Kuznets Curve, which indicates that environmental indicators improve after a certain level of economic development, are studies which suggest social status is also positively related to environmental awareness (Inglehart, 1990; Van Liere & Dunlap, 1980b). Factors such as the level of education (Vining & Ebreo, 1990) and income, lead to people turning more to quality of life issues as their social status increases. Better education leads to better information, which in turn has been associated with higher levels of environmental awareness (Arcury, 1990). It should be noted however, that because social status of an individual can often increase as one gets older, in such cases, the hypothesis about status and environmental awareness contradicts the studies mentioned earlier, which suggest environmental concerns become less as one gets older.

Because right-wing conservative ideology generally favours business and commerce and oppose stronger state intervention, and left-wing policies usually focus on social welfare, it is generally hypothesised that people with liberal or left-wing affiliations tend to be more concerned about environmental issues. However, such hypothesis are based mostly on studies carried out in western countries which have western style political frameworks that are often very different from other countries (Iizuka, 2000). In addition, Inglehart's (1990) ideas that political ideology is born from one's attitude, not visa versa, should also be considered.

Gender is another factor thought to be closely related to environmental awareness with studies that suggest women are more aware of environmental concerns than men (for example; Stern et al., 1993; Zelezny et al., 2000) supported by the Cross National Harris survey done for the UNEP in 1989. This may be because women tend to be more relationship-orientated than men (Schultz, 2002) or because women in developing countries are more often the water collectors, gathers of wood, and harvesters of produce, and therefore having a closer day-to-day involvement in, and deeper awareness of their community and its dependence on a healthy environment. As such, Martinez-Alier (2002) emphasises the importance of recognising the contribution women make towards environmentalism in poor communities, particularly in rural areas. However, other studies (for example, Arcury, 1990) show contrary results that men are more likely to be more environmentally concerned. So again, the hypothesis of a clear positive correlation to awareness cannot be relied upon. Further studies therefore need to take account of the many cultural variables which often define gender based social roles, and which, of course, vary greatly between different regions, countries, and indeed in some cases, neighbouring towns or villages.

As Tuna (2004) points out, many of the contradictory findings between studies into the demographic factors which might effect environmental concern are probably due to the variations in the sampling each study uses with the same predictors showing different effects for different samples, for example, based mostly on either community, state or national level samples. Studies into these situational or demographic factors also need to account more for the correlations, which are likely to exist between the individual factors themselves. Buttel and Flinn (1974), for example, showed that the effects of education, income and occupation on environmental concern were interrelated with whether people live in an urban or rural setting, their age, and social class. Arcury (1990) also notes the interrelationship between social class and education. Debate about associations between environmental awareness and these demographic variables is therefore continuing (Sabah, 2008).

There are two areas of study which usefully look at the collective effects of situational variables on environmental attitudes, and as such attempt to determine what Iizuka (2000) refers to as the "core factor" that may determine what decisions individuals are likely to make. The first of these is the effect that a society's basic values and beliefs – its "value system" – have on an individual's attitudes about

environmental concerns. Much of the research into value systems has been done by Inglehart (1971, 1977, 1990, and 1997), who saw evidence of a slow transformation of society from materialistic, or mostly acquisitive, to post-materialistic. He measured this change using the so-called “Inglehart-Index”. This index, and the ideas connected to post-materialism, have been subject to much critical discussion and although some doubt its effect on environmental attitudes (for example; Furman, 1998), it has been included in many high profile human science surveys which include the World Value Survey, and the General Social Survey (GSS) in the US.

Another more holistic perspective on what effects environmental attitudes focuses on understanding more about worldview. In this area of study Buttel (1996) highlights the need for a paradigm shift from the conventional sociological “Human Exceptionalism Paradigm” (HEP); the view that humans are exceptional but not exempt from the world, to a “New Ecological Paradigm” (NEP); in which humans are seen more as part of the ecological system. Indeed, it is this ecological worldview which Xiao and Dunlap (2006) claim to be as “the central component of environmental concern” which “provides the source of coherence of environmental concern” (Xiao and Dunlap, 2006). Described as a “multi-component measure of environmental concern” they claim to show it to be the strongest predictor of environmental concern compared to other social-demographic variables. Although the early use of the NEP index (Dunlap and Van Liere, 1978) to measure environmental attitudes was considered uni-dimensional it was used in other studies (for example; Tarrant and Cordell, 1997) and was shown to be a fairly rigid index for measuring environmental attitudes.

As Tuna ((2004) highlights in his study however, dimensionality of environmental attitude research was considered by many as inadequate and conceptualized environmental attitudes as multi-dimensional (for example; Dunlap and Van Liere, 1984). Cluck et al. (1997) defined these as “environmental worldview,” “environmental concern” and “environmental commitment”. These were also confirmed by Tuna (2004) in his study of environmental attitudes in a non-western country, Turkey.

As Iizuka (2000) explains, the value system and worldview act as a filter for the information a person receives and ultimately determines how that person perceives it. However, as she also points out, although they may be significant in predicting environmental action, most of the key studies have not focused on showing proof of the existence or nature of this link. We shall return to this later by looking at studies, which do however, attempt to analyse the link between environmental awareness and action.

In addition to situational factors, studies have also identified evidence of the effects psychological variables might have on a person’s attitudes to the environment. Stern and Dietz (1994), and Stern et al. (1993) theorised that environmental attitudes could be influenced by altruistic, egoistic, or biospheric values, whereby attitudes towards the environment are formed on the basis of cost

benefit judgements with regard to humans groups, themselves, and to other species and ecosystems. These three groupings of value motivators towards environmental concern have been shown in results from many different countries (for examples see; Schultz, 2001, 2002; Schultz et al., 2005; Schmuck, 2003). However, although it is claimed that expressed attitudes “tend to fall within one of the three attitudinal types” (Schultz, 2002, ¶ 20), it should be noted that Schwartz (1992, 1994) identified Conservative (traditional) values and Openness to Change as additional value types. And as we see later these are used as part of Stern et al.’s (1999) Value-Belief-Norm theory (see figure 2).

Finally, differences have also been shown to exist between the ‘three’ value motivators based on cultural factors. For example, based on national US data, Johnson et al (2004) found environmental beliefs, as measured by NEP, were significantly different between different ethnic groups. Leung and Rice (2002) also showed that there were significant differences in biocentric values of Chinese Australians and Anglo-Australians. In Milfont et al.’s (2006) study into the cultural effects on environmental attitudes, they concluded that there were “systematic ethno-cultural differences” with Asian New Zealanders showing stronger concern for altruistic values, while European New Zealanders showed a stronger association with egoistic values. Schultz (2002), identified similar differences but between individualistic and collectivistic cultures. While the former were associated more with egotistical attitudes about the environment, the latter, which place greater importance on relationships that may extend to those with the natural environment, expressed stronger tendencies towards more altruistic and biospheric attitudes (Schultz, 2002).

## **Studies into relationships between attitude & environmental behavior**

### **Action gap**

Schultz usefully points out that, “environmental problems are caused by human behaviour and solving these problems will require changes in behaviour” (Schultz, 2002) and because psychology is primarily the study of human behaviour, we will see that it has contributed significantly to the theories of human cognition and behaviour towards the environment. Ultimately, what matters if any progress is to be made towards reaching adequate levels of sustainable development, is that all the stakeholders at all levels act. It is therefore important that policy makers develop more effective governance mechanisms which are able to reduce the gap between rhetoric and action; the “implementation gap”. Indeed, this was recognised to exist between international commitments and measures of concrete outcomes, and was the focus of the World Summit on Sustainable Development (WSSD) in 2002.

Similarly, there is the problem of reducing the “value-action gap”, a term used to describe the gap between the value attached to the environment and the cost of damaging it, and the level of action taken to address the problem. It is often accepted that many motivational barriers exist for individual and collective environmental action, and that the factors influencing peoples’ willingness to

reduce environmental damage are fundamentally different from the factors involved in making people actually take action to reduce the damage (Barr, 2006). Consequently, many recognize that a fundamental shift in the attitudes of the public towards environmental issues is needed if sustainable development is to be achieved. As part of this process it is necessary therefore to explore the relationship between attitudes and behavior or as Barr puts it, “there exists a conflict between stated attitude and action that requires closer examination” (Barr, 2004).

### ***Direct relationships***

The study of attitudes has been regarded as an important area because of the presupposition that positive attitudes towards the environment were a significant predictor of positive environmental action (for example; Stern & Oskamp, 1987; Tarrant & Cordell, 1997). However, other studies (for example; Brand, 1997; Buttel, 1996; Van Liere and Dunlap, 1980b) show evidence of either a weak or even inconsistent link between the two. Factors that may explain a lower than expected level of positive action towards the environment are characterized by Iizuka (2000) as being the result of:

#### *The subjective nature of environmental concerns*

Trade-offs, and the global and inter-connective nature of many environmental problems makes them inherently complex, which in turn, means that it is often difficult to picture or appreciate the links between the one's actions or non-actions and the impact they can have on the environment.

#### *The dilemma between convenience and conservation*

Behavioural changes are particularly difficult if the changes lead to less conveniences and more effort. People will naturally act based on his or her own interests and the belief that resources are unlimited (Iizuka, 2000). There is a tendency, as illustrated by the “Tragedy of the Commons” (Hardin, 1968) to free ride and this will only disappear when collective action is brought about.

#### *The problem of identifying what the best form of action actually is*

Again, because of the complex nature of many environmental issues, the action people take towards helping the environment can often be ineffective or indeed harmful as the result of incorrect or insufficient information and technologies.

Consequently, policy makers cannot rely on any simple relationship between awareness and behaviour and as Anable et al. (2006) point out, for effective change to be brought about a variety of factors need to be considered and will be different for different behaviours and for different people. Barr (2004) highlights an approach by researchers with a mostly geographical background, which he describes as a “culturally informed perspective” and which could give further clues as to why pro-environmental behavior may often not materialize to the levels expected. These include: skepticism of policy makers (Macnaghten and Urry, 1998), the localisation of an issue (Macnaghten and Jacobs, 1997), and scale of

an issue (Burgess et al., 1998). If an issue is localized, people are more likely to perceive their action or non-action as having a more significant impact. Similarly, the scale of an issue may be deemed so large that taking action may be regarded as insignificant, and so not worth doing.

A wider field of study in this area however is that of social-psychology which draws influence from the fields of geography and of psychology. This research into environmental values has followed two main lines. One focuses on four main groupings of value; self-interest, altruism, traditionalism, and openness to change, and found some fairly consistent theoretical and empirical support for the relationship between values and environmental behavior. The other line of research shows that environmentalism may increase as a result of post-materialism (Inglehart, 1971, 1977, 1990, and 1997) mentioned in an earlier section.

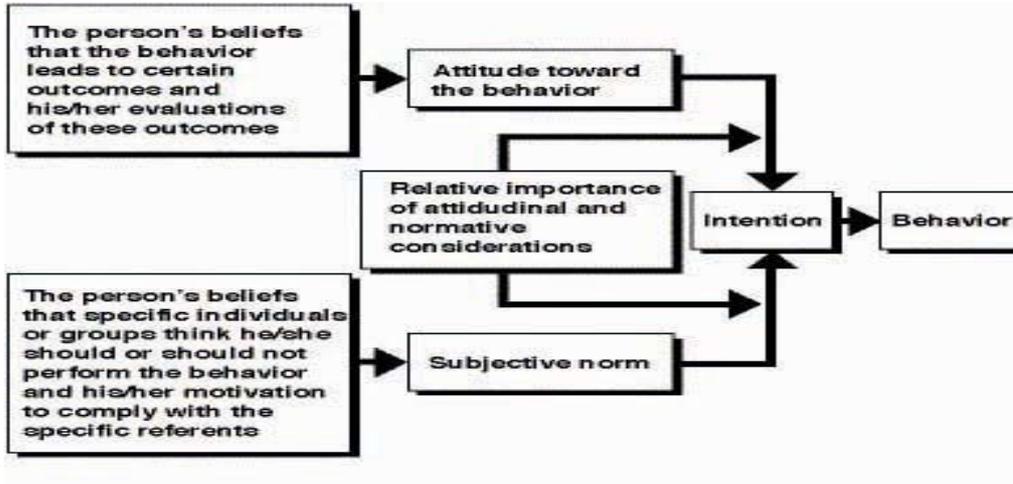
We shall now look at some of the key studies and theories that have considered the significance of values in determining environmental behaviour.

### **Theory of Reasoned Action (TRA)**

Despite the difficulties in finding definitive links between awareness, attitude, and behaviour, there have been a number of theories, which have attempted to do so. One of the most influential is the socio psychology Theory of Reasoned Action. This theory attempts to shed light on how attitude impacts behavior, and is an area of study for which Charles Darwin is credited as starting in 1872. Then, later in the 1930's, as Taylor (2001) points out, psychologists defined attitude as "emotions or thought with a behavioral component", which was expressed either verbally or non-verbally. By the 1960's however, doubt was being cast over the positive correlation between awareness and behaviour and as a result of this climate, Fishbain and Ajzen (1975, 1980) published their Theory of Reasoned Action (TRA). This theory conceptualized a person's behaviour (their behavioural intent) as a function of their attitude towards the outcome of that action (their attitude), and by the options of those around them (their subjective norm).

However, Sheppard et al. (1988) found that the validity of this relationship was limited when a person's goals might be incompatible with the behaviour in question, when choices of action were available, or when intentions and expectations are different. In each of these cases, intentions may change significantly. As Taylor (2001) highlights, one of the most significant limitations is the assumption that behaviour is under volitional control. Accordingly, irrational decisions, habitual actions or any behaviour that is not consciously considered cannot be explained by this theory. Hale et al. (2003) also highlighted exceptions from the theory including habitual behaviour patterns, which are particularly relevant to sustainable development because policies designed to bring it about often dictate that fundamental lifestyle changes will often be needed if they are to be effective in the long term.

**Figure 1:** Model of the Theory of Reasoned Action



Source: Fishbain and Ajzen, 1975

### **Theory of Planned Behaviour (TPB)**

To overcome these limitations, the theory was modified to produce the Theory of Planned Behavior (TPB) (Schifter and Ajzen, 1985). It includes the additional components of Control Beliefs and Perceived Power, which together they called Perceived Behavioral Control (PBC). This shows that motivation, or 'intention', is determined by how difficult the stakeholder perceives the task to be and whether they expect to successfully complete the action or not.

### **Altruism**

With interest into the importance of values, and in particular, altruism there has also been an interest into the possible role they might have as part of mechanisms that are able to overcome free-rider incentives that are inherent to "Tragedy of the Commons" situations (Niemeyer, 2002). Hirose (1995) applied Fishbain and Ajzen's TRA to show that the subjective norm was important in helping to explain why individuals are motivated to take collective action. In his studies, people were found to be more likely to take positive action towards the environment (in this case, water conservation) if the action was outside the house and thus observable by others. It is also useful to note a study by Geller (1995), later supported by Allen and Ferrand (1999), which also suggested a key role played by altruistic motivation he showed to be created through an individual's needs for self-esteem, belonging, personal control, self-efficacy and optimism (Allen and Ferrand, 1999).

### **Norm Activation Model**

Also associated with the concepts of social values or motives is the Norm Activation model (Schwartz, 1977; Schwartz and Howard, 1981) which considers altruism as a significant motivator for action. In the model, the 'social norms' or set of ideas which are claimed to motivate certain behavior comprise of expectations, obligations, and sanctions of social groups (Schwartz, 1977). There

are also 'personal norms', which, although formed through a process of social interaction, are rooted in the self. The conditions under which the action is motivated by altruistic values, are most likely to occur are when, for the actor, there is an awareness of need, of consequences, and of responsibility (Schwartz, 1977; Blamey, 1998). The model has been used in a number of studies to explain environmental behavior, for example, towards the 'commons' (Blamey, 1998), and with regards recycling and energy conservation (for example; Barr, 2004; Barr et al., 2003; MacNaughten and Jacobs, 1997; Widegren, 1998). Support for these ideas of social and personal norms as significant predictors of non free-rider action can also be found from Schwartz and Shuva (1992), and Stern et al. (1999) and Hunt et al. (1994). A useful summary of their ideas is presented in table 1.

As Stern et al. (1999) warn however, the distinction between altruism towards humans and altruism towards other species may be important. They go on to cite Stern et al. (1993) who found evidence that the distinction was more important within environmentalist groups such as U.S. students.

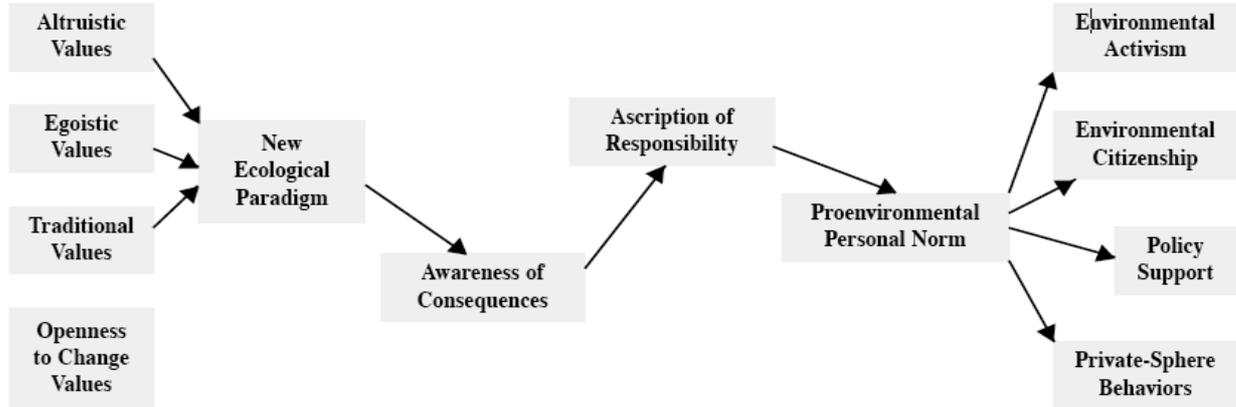
**Table 1.** Summary of ideas about social and personal norms as significant predictors of non-free-rider action

| <b>M. Schwartz &amp; Shuva</b>  | <b>Hunt et al.</b>                    | <b>Stern et al.</b>                        |
|---|---------------------------------------|--|
| Conditions for overcoming free-riding                                 | Steps in forming an activist identity | Value –Belief–Norm theory (figure 2 below) |
| Sense of group fate   | Diagnostic                            | Awareness – of consequences                |
| Belief group action is viable   | Prognostic                            | Ascription of responsibility               |
| Group ties motivate member carry out group obligation to tackle issue | Motivational                          | Pro-environmental personal norms           |

### **Value-Belief-Norm theory (VBN)**

Another influential theoretical framework which considers the role played by values on environmental behaviour is the Value-belief-norm (VBN) theory (Stern et al., 1999). It combines theoretical work on values and norm-activation processes and includes the concepts developed and used in many of the studies discussed above. In doing so, Stern et al. set out a holistic model of the variables they considered as part of their VBN theory (Figure 2). In this model we can see the process by which values; altruistic; egoistic; biospheric (or as Stern et al., (1999) refer to as traditional or conservation values); and openness to change, are translated into environmental behavior.

**Figure 2.** Model of variables in the Value-Belief-Norm theory



Source: Stern et al., 1999

Finally it's should be mentioned that attempts have been made to account for the many different factors and approaches by combining different theoretical approaches with the associated variables. Oreg and Katz-Gerro (2006) for example considered the relationships between beliefs, attitudes, and behaviours and built upon the TPB (Schifter and Ajzen, 1985), Stern's (1999) VBN theory, and Inglehart's (1971, 1977) ideas on post-materialistic values. They confirmed that post-materialistic values did at least effect environmental 'concern', and that concern, perceived threat from a given issue, and perceived behavioural control, effected willingness and ultimately, the level of environmental action. It also highlighted the significant affect of cultural factors on environmental behaviours. Similarly, Chaisamrej and Zimmerman integrated TPB, altruism, attitudes, and the cultural effects of individualism and collectivism with respect of paper recycling behaviours. The results showed that TPB determinants were potential predictors of recycling and altruism a significant factor explaining attitudes (Chaisamrej and Zimmerman, 2007). In the conclusion, the authors highlighted the benefits that could be derived by communication campaigns with information that was tailored to suit different target audiences in different cultural milieus.

### Conclusion

With the complexity of this study area, it is not surprising that these studies have not yet give us any definitive model of the links that exist between peoples' environmental attitudes and behaviour. However, they do suggest that different environmental actions can be fundamentally different in nature, and be influenced by different social, psychological, and cultural factors.

Part of the problem with this complex area of study is that much of the investigative work has employed quantitative methods, which Fahy and Davies (2007), Blake (1999), and Hobson (2003) agree, is too deterministic for studying behaviour. Instead, they regard more qualitative techniques as a necessary

precursor to understanding and ultimately predicting stakeholders' behavior. Indeed, as a way of bridging the perceived gap between theoretical constructs of behavior and studies of actual practice, Fahy and Davies (2007) opted to carry out an action research project into attitudes and action towards waste. They confirm what we have seen in this paper– that there is a diverse range of variables, which need to be considered – and conclude that to really understand the effects and interrelationships that exist between them, and the level of environmental action actually observed, action research may be an invaluable tool. This takes us back to the example earlier with the Japanese response to the nuclear disaster in Fukushima to save energy. Such actions would naturally be assumed to represent an increase in environmental awareness, whereas further investigation into the motives of increased energy saving may prove to be simply the threat of power cuts and a sustained government and media coverage of this threat.

Despite the complexity of this area of study, it is with some certainty, that awareness and it's correlation with positive action is set to rise. As environmental stresses continue to increase, and predictions of tipping points occurring become shorter in timescale, environmental problems and the action needed to resolve them are inevitably becoming more visible and difficult to ignore, even among the populations of the richer nations of the north. Consequently, whether it is too late or not, certain motivational factors will become clearer and indeed easier to rely on by policy makers as stakeholders become increasingly motivated to act out of a sense of moral duty, security of themselves and their families, and even for the most hardened environmental sceptics and politically conservative zealots; financial considerations. Inevitably, the role of knowledge and awareness will become more a matter of empowerment and of helping the various actors overcome any barriers, which might still prevent them from acting.

Policy holders on the other hand should not wait and rely this situation developing because by the time it does, it may be to late to mobilise the level of action required to prevent the most serious and possibly irreversible environmental collapses from happening. Instead, they should focus on making as many stakeholders as possible aware of the need to act before it is too late. In doing so they should themselves be aware of the myriad of factors that potentially affect behaviour and in doing so carefully consider the micro factors before initiation macro-style policies. For effective policy solutions therefore, grass-root led initiatives, which by nature more likely to take account of local factors that we have seen can effect participation, are more likely to be successful.

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