

Environmental Decision-Making Models: A Scoping Review

Sreeja Gopinath^{1*}, Aneesh Kumar²

ABSTRACT

The human race is proving its extraordinary intellectual capacities through various discoveries and inventions. However, that species acts like it has only a below-average intelligence for considering the environmental consequences of its actions. Such a situation poses a threat to the existence of life on Earth. Therefore, it is time to wake up and develop a collective capacity for ecological intelligence. Environmental decision-making (decision-making with a foresight into the environmental consequences of such a decision) is the most important component of ecological intelligence. An attempt is made here to understand different psychological variables influencing environmental decision-making. For this purpose, a scoping review of different environmental decision-making models is carried out. Out of the 2058 articles published from 1998 to 2018, four articles that best explain the psychological variables that lead to wise environmental decision-making through different models and theories were selected and reviewed in detail. From the review, it is found that the Norm Activation Model, Theory of Reasoned Action and Planned Behavior, Value-Beliefs- Norm theory, and Batson's Model of Prosocial Behavior are the main models and theories applicable in the area of environmental decision-making. The psychological variables revealed through these models and theories and the implication of these variables in the process of human development to result in wise environmental decision-making are discussed.

Keywords: *Ecological Intelligence, Environmental Decision Making, Models, Theories*

The human race is proving its extraordinary intellectual capacities through various discoveries and inventions. But that species acts like it has only a below-average intelligence for considering the environmental consequences of its actions. Such a situation poses a threat to the existence of life on the Earth. Therefore, it is time to wake up and develop a collective capacity for ecological intelligence. Ecological intelligence is the capacity to adjust to the ecological niche, and for spreading this collective intelligence, the individual level ability is the mastery in making decisions ideal through environmental aspects (Goleman, 2009). Environmental decision-making refers to a decision regarding an environmental affair or about an activity that may have environmental consequences (Gray et al., 1996).

¹Department of Psychology, CHRIST (Deemed to be University) Bangalore

²Department of Psychology, CHRIST (Deemed to be University) Bangalore

*Corresponding Author

Received: February 21, 2024; Revision Received: February 24, 2024; Accepted: February 28, 2024

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According to Goleman (2009), one important application of environmental decision-making is in our buying behavior. He posits that our decision to buy or not to buy should be made only after considering the environmental effects that will be created by the products we intend to buy.

Presently, only a few studies have been conducted in the area of environmental decision-making. A psychologist's role is to investigate the prerequisites in an individual for wise environmental decision-making. Here, an attempt is made to understand the prerequisites for wise environmental decision-making through a scoping review of different studies that made use of different models and theories to explain the concept of environmental decision-making.

METHOD

The five-stage framework proposed by Arksey and O'Malley (2005) was used for this scoping review. These five stages are (1) identifying the initial research questions, (2) identifying relevant studies, (3) study selection, (4) charting the data, and (5) collating, summarizing, and reporting the results.

Identifying the Initial Research Questions

This review was carried out to get an idea about the different models and theories that can explain environmental decision-making behavior and to identify the psychological variables revealed with the help of these models. An appropriate research question was framed for this purpose:

1. What are the different models of environmental decision-making?
2. Which are the psychological variables important for environmental decision-making?

Identifying Relevant Studies

For identifying relevant studies, the following databases were used: JStor and Proquest. Appropriate keywords were identified for the search. The search criteria used by the databases were studied clearly before starting the search for better search results. The inclusion and exclusion criteria were developed. Studies in the subject of Psychology, studies from 1998-2018, and peer-reviewed studies constituted the inclusion criteria, and studies from subjects other than Psychology, studies outside the period of 1998-2018, and studies that were not peer-reviewed constituted the exclusion criteria.

Study Selection

Two thousand fifty-eight studies were identified through the search. Even if all the studies were related to environmental decision-making, only 16 studies made use of any models to explain environmental decision-making behavior. Among these 16 studies, only four studies explained the concept of environmental decision-making as it is defined in this paper. Therefore, finally, four studies were selected.

Data Charting and Collation

The selected four studies were summarized in a table in terms of author, year, study location, aim, theoretical framework, methodology, study population, outcome measures, and results.

Summarizing and Reporting Findings

The last step of the scoping review is in which the data is summarized, and findings are reported.

RESULTS AND DISCUSSION

Table 1 Charting of the Included Studies

| Author | Year | Study location | Aim | Theoretical Framework | Methodology | Study population | Outcome Measures | Results |
|--------------|------|----------------|---|--------------------------------------|--|-------------------|--|--|
| Lee & Holden | 1999 | USA | To understand the various determinants of environmental consumer behavior on the basis of Batson's model of prosocial behavior. | Batson's model of prosocial behavior | Survey design, 78 business students, likert type attitudinal items included measures of cognitions (beliefs), affect (feelings), self perception and faith or trust in others as independent variables. In addition three ability items, three empathy items and three distress items also as independent variables. Consumer behaviors, willingness-to-pay behaviors and regulatory support behaviors as dependent variables. | Business students | 1. Relationship between attitude and environmentally conscious behavior. 2. Relationship between distress, empathy and environmentally conscious behavior. 3. Relationship between Perceived Consumer Effectiveness (Self Perception), Faith in Others and environmentally conscious behavior. | Here environmental behaviour is considered as prosocial behavior as the after effects of such behaviors are shared by the entire community both now and in the future. Attitude is a significant predictor of all pro environmental behaviors, but attitude alone is not sufficient. Distress and empathy lead to an increase in personal environmentally conscious consumer behavior. Consumers with high Perceived Consumer Effectiveness are more likely to adopt personal environmentally conscious behavior. Consumers with Faith in Others tend to seek to increase environmentally conscious behavior of others. That is, empathy and distress in the environmental plight of others have independent effects on environmentally conscious behavior beyond the influence of attitude. |

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| Author | Year | Study location | Aim | Theoretical Framework | Methodology | Study population | Outcome Measures | Results |
|-------------------------------|------|----------------|--|--------------------------------------|--|-------------------------------|--|---|
| Matthies, Klockner & Preibner | 2006 | Germany | To initiate the try-out of a new travel mode behavior (try out taking public transport instead of car) in a sample of habitual car users | Norm Activation Model | Experimental design, sample of 297 car users, telephone interviews were used as the method of data collection, Try out of the public transport behavior was the dependent variable, personal norm to reduce car use, social norm to reduce car use, perceived behavioral cost and strength of car habit were taken as the independent variables. A free ticket to defrost car use habit and a statement of commitment were used as the manipulation in the intervention. | Adults (average 45 years old) | 1. The influence of personal norm and non moral costs on trying out public transport for a regular trip 2. The effect of free ticket intervention and commitment intervention on trying out behavior. 3. The interaction effect of personal norm and commitment on trying out behavior. | The Norm Activation Model focuses on the activation and influence of personal norms and behaviour and it explicitly takes into account that a moral motivation has to be balanced against other competing motivations. Personal norm is the central variable in the model. In this study the blocking effect of car use in the behavior has been included in the model. |
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| Velnamby & Sivapalan | 2016 | Sri Lanka | To develop an integrated conceptual model to predict the purchase intention and behavior toward green products. | Theory of Reasoned Action and Planned Behavior, Altruism and Pro-Social Behavioral Theory, Green Marketing Strategy: Stakeholder theory perspective, Model of Consumer Behavior | Conceptual paper | | 1. Relationship between attitude and environmentally conscious behavior. 2. Relationship between distress, empathy and environmentally conscious behavior. 3. Relationship between Perceived Consumer Effectiveness (Self Perception), Faith in Others and environmentally conscious behavior | According to stakeholder theory, organizations should conduct business beyond sole consideration of making profit. Based on this Cronin et al. (2011) developed a model which is represented as green marketing strategy in the stakeholder theory. Theory of Reasoned Action (TRA), Theory of Planned Behavior (TPB) and Altruism & Prosocial Behavior Theories were used to explain the green purchase intention in the field of green consumerism. According to the Theory of Planned Behavior, from attitude towards a behavior personal norm and perceived behavioral control predict intention to perform that behavior and this intention together with perceived behavioral control predict the actual behavior. The finding by Ohtomo and Hirose showed that although consumers have the intention to purchase green products, they do not act in accordance with their intentions. This can be called as value-action gap. Under the Altruism and Prosocial behavior theories two models, |

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|--------|------|----------------|-----|-----------------------|-------------|------------------|------------------|---|
| | | | | | | | | <p>Norm Activation Theory of Altruistic Behavior and Value-Beliefs-Norm Theory-VBN Theory were discussed. In the Norm Activation Theory of Altruistic Behavior activation of personal norm is considered as the important antecedent of proenvironmental behavior. A person's general and environmental value orientations influence the personal norms. Awareness of consequences, awareness of needs, situational responsibility, efficacy, ability and denial of responsibility are the potential antecedents of personal norms. According to the Value-Beliefs-Norm Theory personal norm is the key determinant that resolves the value-action gap. Three value types, egoistic orientation, altruistic orientation and biospheric orientation are required for attitude formation and norms that determine actual behavior. Theory of Planned Behavior and Value-Beliefs-Norm Theory were mainly used to develop a conceptual model regarding green purchase intention which in turn will lead to purchase behavior.</p> |

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| | | | | | | | | Environmental attitude, Environmental Concern, Perceived Consumer Effectiveness, Health Consciousness, Social Influence, Media Influence and Perceived Government Initiatives were considered as the antecedents of green purchase intention. Environmental attitude and social influence were conceptualized with the help of attitude and subjective norm respectively in the TPB. A new variable perceived consumer effectiveness was included to measure perceived behavioral control in the TPB and norms in the VBN Theory. In addition, environmental concern, health consciousness, media influence and perceived government initiatives were incorporated in the model. |

The first study, which made use of Batson's model of prosocial behavior to explain environmental behavior, showed that environmental behavior can be considered prosocial behavior. According to this model, there are two egoistic and one altruistic path to prosocial behavior. Each path goes through an instigating situation, a consequent motivational state, a cost-benefit analysis of potential responses, and a behavioral response. The study result showed that empathy and distress lead to environmentally conscious consumer behavior. Perceived Consumer Effectiveness is also important. Distress leads to environmentally conscious consumer behavior through path two (egoistic path). Empathy leads to environmentally conscious behavior through path three (altruistic path). Perceived consumer effectiveness comes into play in the cost-benefit analysis stage.

The Norm Activation Model focuses on the activation and influence of personal norms on behavior. Personal norm is the central variable in the model. In the second study, the effect of habit on behavior has been included in the model. The study result showed that the

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motivation resulting from the activation of personal norms (moral motivation) should be balanced against the motivation resulting from other considerations (e.g., money). Results showed that car use habit also has a blocking effect in the reduced car use behavior (reduction of car use).

Several models have suggested a pro-environmental attitude as the most important component of pro-environmental behavior. However, most of the models give importance to the cognitive components of the pro-environmental attitudes, not the affective component. The affective component of a pro-environmental attitude is the connection to nature. The third study discusses the importance of connection to nature and how the connection to nature affects children's pro-environmental choices. Based on the results, the study proposes a model indicating the factors important for children's pro-environmental choices. Empathy for nature's creatures, enjoyment of nature, sense of oneness, and sense of responsibility constitute connection to nature. Apart from connection to nature, variables such as nature-based experiences, values, and self-efficacy are also important components of pro-environmental behavior. Moreover, knowledge of the environment and previous experience in the environment can predict children's connection to nature and interest in environmentally friendly behaviors. Some external factors like nature near the homes and family values are also significant. Therefore, it can be said that connection to nature was the strongest independent variable that influenced children's interest in environmentally friendly behaviors. Secondly, family values toward nature predict children's connection to nature and their interest in environmentally friendly behaviors.

In the model used in the fourth study, the Theory of Reasoned Action (TRA), Theory of Planned Behavior (TPB), and altruism and prosocial Behavior theories were used to explain the green purchase intention. Norm Activation Theory of Altruistic Behavior and Value Belief Norm Theory were discussed under the altruism and prosocial behavior theories. Environmental attitude, environmental concern, perceived consumer effectiveness, health consciousness, social influence, media influence, and perceived government initiatives were considered as the antecedents of green purchase intention.

According to the Theory of Planned Behavior, attitude towards a behavior leads to the personal norm, which, together with perceived behavioral control, predicts the intention to perform that behavior, and this intention, together with perceived behavioral control, predicts the actual behavior. In the fourth study, perceived consumer effectiveness was considered equal to the perceived behavioral control in the Theory of Planned Behavior. Environmental attitude and social influence were considered equal to the attitude and subjective norm, respectively, in the Theory of Planned Behavior.

According to the Norm Activation Theory of Altruistic Behavior, activation of personal norms is the most important predictor of pro-environmental behavior. Awareness of consequences, awareness of needs, situational responsibility, efficacy, ability, and denial of responsibility are the potential antecedents of the activation of personal norms. Moreover, both general and environmental value orientations influence personal norms.

According to the Value-Beliefs-Norm Theory, three value types, egoistic values, altruistic values, and biospheric values, are required for the formation of attitudes and norms that determine actual behavior. In the fourth study, perceived consumer effectiveness was considered equal to the norms in the VBN Theory.

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In addition to the above-mentioned variables, environmental concern, health consciousness, media influence, and perceived government initiatives were also incorporated into the integrated model of green purchase intention.

CONCLUSION

Norm Activation theory of Altruistic Behaviour, Theory of Reasoned Action and Planned Behaviour, Value-Beliefs-Norm theory, and Batson's Model of Prosocial Behaviour are the main models and theories that can best explain environmental decision-making behavior.

Empathy, distress, perceived control (self-efficacy), pro-environmental attitudes and values, knowledge of the environment, experience with nature, environmental concern, and health consciousness were considered the main prerequisites for wise environmental decision-making. Social influence, media influence, and perceived government initiatives were considered as the external factors that affect the environmental decision-making of an individual. Moreover, some habits can hinder wise environmental decision-making.

Implications

The Value-Belief-Norm Model, Norm Activation Model, and the model proposed by Cheng and Monroe reveal the importance of values in environmental decision-making. Values can influence perceived control also (Chaung, Chen & Chen, 2018). Therefore, the development of environmental values should be taken into account. Families, different cultural aspects, and schools affect the value development process (Adams, 1974). Hence, families, thoughtful government-level initiatives, and schools can play a major role in creating people with environmental values. Moreover, if human behavior is understood in terms of people's goals and feelings, not about rules and effects from early school years onwards, that will pave the foundational stones for the internalization of values (Thompson, 2015)

It was found that empathy is an important prerequisite for environmental decision-making. Empathy can be used to create environmental values (Lithoxidou, Georgopoulos, Dimitriou & Xenitidou, 2017). Therefore, efforts should be taken to develop empathy from infancy onwards since the early roots of empathy are in infancy (Bhattacharya & Sengupta, 2007).

Since knowledge of the environment is also important for environmental decision-making, efforts should be taken to teach about the environment and environmental issues from preschool years onwards.

Children should be allowed to play outdoors and engage in activities like gardening and caring for animals since the experience with nature is important.

Habits that are harmful to the environment, like car use, can impede wise environmental decision-making. Therefore, precaution should be taken from childhood onward to prevent the formation of such habits.

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Acknowledgment

The author(s) appreciates all those who participated in the study and helped to facilitate the research process.

Conflict of Interest

The author(s) declared no conflict of interest.

How to cite this article: Gopinath, S. & Kumar, A. (2024). Environmental Decision-Making Models: A Scoping Review. *International Journal of Indian Psychology*, 12(1), 1359-1369. DIP:18.01.128.20241201, DOI:10.25215/1201.128