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## Structural Configurations of Social Representations about Climate Change

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**Abstract**

The study looked at college students' meaning-making of climate change, using the lens of Social Representation Theory. Participants were 130 undergraduate students of the University of Guam who were asked to answer a free association questionnaire in which they were to write the first three ideas that came regarding their understanding and description of climate change. Abric's (2012) hierarchical evocation method was used in analyzing the data. Central to the understanding of students is that climate change is synonymous with global warming. Peripheral apprehension of climate change include seeing climate change as modifications in weather, temperature, and season; associating the social object with calamities and disasters, environmental destructions, as well as the effects of these changes on human beings and animals; and the adjustments that human beings have to take on as a form of adaptation. Climate change is also socially understood as weather that has become extreme and unpredictable. Results have implications on the development and implementation of policies on climate change mitigation and adaptation.

**Keywords:** Social Representation Theory, Climate Change, Hierarchical Evocation, Guam

Climate Change is the long term change of weather patterns, either due to natural variability or as a result of human activity (IPCC, 2007; Haywood & Schulz, 2007). It is an issue discussed by various sectors of society all over the world because its effect would affect all inhabitants of this planet.

Different countries have responded to the issues in various ways. In the Philippines, Republic Act 9729, also known as the Climate Change Act of 2009 was enacted to ensure protection, not just of the environment, but of the people as well. The law promotes sustainable development so as to meet human needs while at the same time safeguarding the environment for the current and future generations.

As climate change is believed to be mostly caused by human activities (Claussen, 2001), many studies that look into how human beings have contributed to climate change, how they have reacted to it, what measures have human beings done to mitigate climate change, and how they have adapted to it have been conducted by many researchers all over the globe. Most of these studies obtained the points of view of experts in the field.

Not many studies, however, were conducted that looked into how climate change is understood by the "ordinary people". The term, ordinary people, here refers to those who are not experts of climate change. These are people who may "experience" climate change, but who are not scientifically/academically studying the phenomenon. We have also observed that not many studies use the cross-cultural approach in investigating climate change. Because of these, we decided to try to examine the understanding of climate change of people who come from the opposite parts of the globe: Filipinos and Americans.

We used the theory of social representation in the conduct of this study. The theory looks at people's everyday talk about a particular social object (Moscovici, 1988). Social representation is defined by Wagner and colleagues (1999) as the "ensemble of thoughts and feelings being expressed in verbal and overt behavior of actors which constitutes an object for a social group. It is a collective phenomenon that pertains to a community and co-constructed by individuals in their everyday talk and action. These representations reside across the minds of these co-acting individuals," (p. 96).

Jodelet (2006) described a structural approach to explain representations which consists of central and peripheral elements. The central core is the main element, determining the significance of the representation as whole (its generating function), as well as its structure (its organizing function). It is stable and non-negotiable. The central system plays a key role in the functioning and the dynamics of representations (Abric, 1996). The peripheral elements, on the other hand, give concrete content and expression to the central system as well as perform the functions of regulation, adaptation, and protection of the central system (Abric, 2012).

Various studies about climate change have already been conducted by different researchers belonging to different fields – natural sciences, social sciences, and agriculture, amongst others. The central points of these research studies vary, according to the field of specialization of the researchers as well as the angle at which they show preference for. For instance, Jose and Cruz

(1999), as well as Kelkar and Bhadwal (2007) investigated the impacts of climate change on the environment in general and Hughes (2003) looked at the impact of climate change in Australia in particular. Cotton (2003) focused on the effect of climate change specifically on biodiversity.

Social scientists, on the other hand, focus on the impacts of the phenomenon on people and their lives. For instance, Hunter (2003) studied diseases brought about by climate change; Patz, Campbell-Lendrum, Holloway, and Folley (2005) looked at the impacts of climate change on human health; and O'Brien and Leichenko (2000) investigated the combined impact of climate change and economic globalization on people's lives.

Other scientist looked at how the world adapts to climate change. For instance, Berang-Ford, Ford, & Patterson (2011), believing that human systems have to adapt to climate change, studied how this adaptation is taking place. Wanting to be more specific, Berkes and Jolly (2001) examined the social-ecological resilience of a Canadian western arctic community as the people tried to adapt to climate change. Tompkins and Adger (2004), on the other hand, looked at the value of building resilience in both human and ecological systems in coping with changes in the environment.

There are also those that examine possible ways of mitigating the impacts of climate change. For instance, Betsill (2001) studied the probable opportunities and obstacles that may be encountered in trying to mitigate the brunt of climate change in the United States of America.

Looking at these studies, we can see that studies on climate change focus on the impacts of the phenomenon, on how people adapt to it, and what can be done to mitigate the impacts of climate change. Very few studies, however, look into people's shared understanding of the phenomenon; or look into the experts' meanings vis-à-vis lay apprehension of climate change. We believe that knowing people's understanding of climate change is as important as knowing its impacts or how to tone down its effects.

This study aimed to capture the social representations of climate change. Specifically, this study intended to answer the following questions:

1. How is climate change socially represented by the youth and young adults of Guam?
2. What are the structures of their social representation?
   a. What is the central core?
   b. What are the peripheral elements?

## Methods

The study aimed to capture the social meanings that students of the University of Guam make of climate change. In doing so, we used the Hierarchical Evocation Method advocated by Abric (2012).

Participants were 130 undergraduate students of the university. Sixty eight percent (68%) of them were females, 26% were males, and the remaining 6% decided not to identify themselves. These students ranged between 17 and 45 years of age ($M$=23.5, $SD$=5.17). Using the free association technique, respondents were asked to answer the question, *what comes to your mind when you think of climate change?* The participants wrote the first ideas that came to their minds upon reading the question. They were made to write as many as 3 answers for each question.

Adhering to the steps advanced by Abric (2012) in doing hierarchical evocation method, answers in the free word association technique were first reduced using thematic analysis so that the answers were trimmed down and we were left with only eight themes or categories.

Following the examples conducted in other studies using hierarchical evocation method (see Gomes, de Oliveira, and Sa (2008), Roland-Levy, Boumelki, and Guillet (2010), and Walchelke (2008)) we crossed the rate of the responses' frequency and average ranking of importance so as to obtain the structure of the respondents' social representations. We computed for the average frequency by dividing the number of occurrences of words included in the analysis by the number of categories. As we solicited 3 answers from the respondents, we also assigned 2 as average evocation order.

We then plotted the analysis using a four-area chart. The upper left corner contained the core elements, the upper right corner the elements of the first periphery, the lower left corner the contrasting elements, and the lower right corner the second periphery. Themes or categories that were mentioned more repeatedly and more promptly were placed on the quadrant of the central core. Those that were mentioned more repeatedly but less promptly were placed in the quadrant of first periphery. Elements that were more promptly but less repeatedly mentioned were placed in the quadrant of contrasted elements and those that were mentioned mess frequently and less promptly were placed in the quadrant of second periphery.

**Results**

Analysis of the evocation corpus that focuses on the understanding of climate change revealed 362 words/expressions/statements, which, when analyzed using thematic analysis were reduced to 8 themes. Words/ expressions/statements belonging categories that had very low frequency (5% or less of the total frequency) were excluded from the analysis. Table 1 presents the frequency of occurrence and examples of words included in each category as expressed by the students.

**Table 1.** *Category, Sample Words, and Frequency of Occurrence Generated from Free Evocation Task about Climate Change*

| | Category | Sample Words | Frequency |
|---|---|---|---|
| 1 | Global warming | Global warming, greenhouse effects, global "wierding", hot weather, hot gets hotter | 94 |
| 2 | Calamities, disasters | Typhoon, storms, floods, hurricanes, tsunami, water surges, tornado, droughts, acid rain, earthquakes | 37 |
| 3 | Modifications in weather, temperature, season | Change in weather and temperature, seasonal change, temperature changes, change in weather, change in environment, ecological change, drastic temperature change | 29 |
| 4 | Environmental destruction | Thinning of ozone layer, lacks water resources, disturbed ecosystem, destruction of coral reefs, dying trees | 49 |
| 5 | Effects on humans and animals | Loss of lives, people dying, people suffering, stress, illness, diseases Endangered species, animal migration, animals at risk, polar bears (homeless), change in food cycle among animals | 29 |
| 6 | Extreme, unpredictable, bipolar weather | Extreme hotness or coldness, on Guam it's hot/cold; rain/shine, bipolar weather, unpredictable weather, seasons unpredictable, temperature extremes, sunny t rainy | 22 |
| 7 | Cause of climate change | Pollution, carbon dioxide emission, overconsumption, growing population, cutting of tress, industrialization | 22 |
| 8 | Human adaptation | Adjustment, great adjustment, adaptation, change of attire, great change, acclimate, coping to different temperature | 19 |
| Total Frequency | | | 301 |
| Average Frequency | | | 38 |

Table 2 shows the structure of the representation of the students of climate change. Central to the students' understanding of climate change is that it is almost synonymous with global warming. They see the environment as getting hotter, with the temperature getting higher. Along with this are the melting of the icebergs, the glaciers, and the polar caps in the Antarctic, and the rising of the sea level as a consequence and even disappearance of island nations.

Contrasted elements include associating climate change with disasters and calamities that are happening these days and seeing climate change as modifications in the patterns of weather, season, temperature, ecology, and some parts of the environment. The changes can be dramatic and drastic; or it can simply be gradual. Disasters and calamities, for them, include typhoon, storm, tornado, flood, hurricane, tsunami, earthquake, and water surge. Calamities may also come in the form of acid rain and drought.

Element in the first periphery points to environmental destructions that result from the onset of climate change. These environmental destruction may take the form of devastated ecosystem, damaged coral reefs, dying trees, depleted ozone layer, and even diminishing water resources. The earth, according to them, is dying. This element is something that may not be mentioned promptly; however, they are mentioned frequently.

Elements in the second periphery, on the other hand, include what the respondents believe as the effects of climate change to animals and human beings, the causes of climate change, as well as the adaptive behaviors human being have to get inured to in response to changes in the environment. This quadrant also includes understanding climate change as weather that has become extremely hot and cold as well as unpredictable.

Climate change, according to the respondents, would endanger the lives of the animals. It could change the food cycle of animals, cause them to migrate, and even render the polar bears homeless. Human beings, on the other hand, may be caused much stress by the changing climate, as well as grapple with various forms of illness and diseases, which could lead to much suffering and even loss of lives. Causes of climate change for them include pollution and overconsumption caused by growing population, industrialization, excessing cutting of trees, and high level of carbon dioxide emissions.

For many respondents, the changes in climate would cause human being to adapt in order to cope and survive. Part of this adaptation would be to get acclimatized to changing temperatures as well as getting new set of clothes that are weather-appropriate. This would entail much expense, especially in trying to convince people to act in relation to doing environmental conservation.

Lastly, respondents see the changes in climate as extreme as well as unpredictable. That is, climate change is associated with weather that could range from extremely hot and extremely cold. And this could happen anytime. The word commonly used by respondents is *bipolar*. Paralleled to mental disorder, the weather could swing from one extreme to another, unpredictably so.

**Table 2.** *Structure of the Representation of Climate Change among DOSCST Students*

| | | AEO | |
|---|---|---|---|
| | | Low Rank (< 2) | High Rank (> 2) |
| Frequency | *High frequency (>38)* | ZONE OF CENTRAL CORE<br><br>Global warming (*f*=94, *AEO*=1.63) | FIRST PERIPHERY<br><br>Environmental Destruction  (*f*=49, *AEO*=2.10) |
| | *Low frequency (<38)* | CONTRASTED ELEMENTS<br><br>Calamities, disasters (*f*=37, *AEO*=1.97)<br>Modifications in weather, temperature, season (*f*=29, *AEO*=1.86) | SECOND PERIPHERY<br><br>Effects on humans and animals (*f*=29, *AEO*=2.07)<br>Extreme, unpredictable, bipolar weather (*f*=22, *AEO*=2.05)<br>Causes of climate change (*f*=22, *AEO*=2.32)<br>Human adaptation (*f*=19, *AEO*=2.11) |

## Discussion

The study provides ideas how climate change is socially viewed from the perspective of the Guam youth and young adults, giving us a glimpse of what goes on inside their minds. Understanding how this particular group perceives the phenomenon provides us with plausible cues as to the potential intervention that would most effectually work out where this group in the society is concerned. For instance, it can be noted that Guam youth and young adults find it vital for human beings to adapt to changing climate as way of survival. This adaptation may be physiological (e.g., getting acclimatized) or behavioral (e.g., getting weather-appropriate clothes). This tells us that for this particular group, preparation does matter. This is part of their social representation of climate change. This also gives us a glimpse of the kind of policy and intervention that can best be crafted and implemented in terms where climate change mitigation and adaptation are concerned.

We wanted to reinforce the potency of social representation theory particularly in addressing social issues such as climate change. As we can see, findings of the study show the ideas of the youth and young adults in Guam which are formed and transformed through their interactions with one another (Moscovici, 1988; Wagner, et al., 1999), coupled with the influence of the media (Bauer & Gaskell, 1999) and their culture (Levin-Rozalis, 2001; Moscovici, 2001). For instance, there is this perception that changes in climate are caused by pollution, carbon dioxide emission, overconsumption, and growing population; which could result to environmental destruction as well as suffering of both humans and animals. The respondents are clearly talking about a similar experience as well as experiences of other people in other parts of the world, as seen on television, read on the newspapers, or encountered on the internet. Social representation theory believes that recurrent social interactions serve as a background in which understanding of a social object is developed. And the explanations used to understand a social object are attached to various factors that link to the culture of the group.

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