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# ATTITUDES TOWARDS A CLIMATE NEUTRAL SOCIETY ACROSS CULTURES

Differences in implicit and explicit attitudes between indians and swedes

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## ABSTRACT

Recently, scientists have highlighted the importance of spreading information about climate change in the world, but the public attitude towards this topic plays a big role in knowing how to communicate with the public about climate change issues and solutions. This study investigates if there are any cultural differences between Swedish and Indian individuals regarding attitudes towards environmental issues. Within this study there were two sub studies; focus groups and an experiment. One of the focus groups consisted of Swedish participants, and the other consisted of Indian and Bangladeshi participants. The experiment consisted of an Implicit Association Test (IAT) and two explicit questionnaires.

The main finding was that there was no significant difference in the explicit tests between the Swedish group and the Indian group. However, there was a significant difference in the implicit test between the two groups. This indicates that there are no differences between the groups when they are grading themselves, but there is a tendency of an underlying implicit difference. A difference that is not directly or openly expressed.

**Key words**: Focus groups, Implicit Association Test, Climate, New Ecological Paradigm, Attitudes

## INTRODUCTION

### Background

#### *Climate neutral society*

To revert the effect of the carbon dioxide emissions across the globe (UN Environment, 2018), efforts are being made to create a society with net zero carbon dioxide emissions called a *climate neutral society*. In a climate neutral society all carbon dioxide emissions are reduced, and all remaining emissions must be completely compensated for (Mistra Carbon Exit, 2018). This development looks different across the globe, e.g. in Sweden – where the emissions are decreasing – and India/Bangladesh – where the emissions are increasing (Statista, 2019; Muntean, et al., 2018). Because of this, studying the attitudes towards concepts related to a climate neutral society of people from India, a developing country, and Sweden, an already developed country, is of interest.

#### *Attitudes and behaviour models*

Attitudes can be either explicit or implicit. Explicit attitudes are the ones that are self-reportable and conscious that derive from introspection. Implicit attitudes are the unconscious attitudes that you are unaware of (Greenwald & Banaji, 1995).

Attitudes seems to be affected by social factors and vary slightly across cultures. Many studies have previously investigated explicit attitudes across cultures to increase the public engagements, e.g. WorldWideViews project (for summary, see: Wibeck, 2014). Implicit attitudes between cultures have been studied using IAT (Jiang, Yue & Lu, 2011). Other studies have also been able to discover differences in how different cultures view the contents of the concepts regarding 'self' and 'others' differently (Bradford et al., 2018).

### Problem specification

The questions this report aims to answer are:

(1) What concepts are used to describe a climate neutral society?

(2) What implicit biases and explicit attitudes are there towards concepts used to describe a climate neutral society?
(3) Are there any cultural differences in explicit and implicit attitudes towards the concepts used to describe a climate neutral society?

### Purpose of this paper

The purpose of this paper is to highlight the similarities and differences in attitudes of people from different cultures regarding concepts related to a climate neutral society. The paper aims to discover both implicit biases and explicit attitudes about the concepts regarding a climate neutral society in order to gain insight into how attitudes towards a more climate neutral society can be improved.

### Methods used for this study

In addition to the previously mentioned methods, two explicit questionnaires were used. Both methods included participants with Swedish and Indian nationality respectively, to be able to compare the two groups. The results from the IAT were used to discover any potential differences in these attitudes depending on nationality. The questionnaires were then used to analyse the correlation between the participants implicit and explicit attitudes.

# RESEARCH APPROACH AND METHODS

### Focus groups

The number of participants in both focus groups were 6 ($N$ = 6) and they were all between the ages of 18–29. The first group consisted entirely of participants with Swedish nationality, whereas the second group consisted of participants with Indian or Bangladeshi nationality.

#### *Participants and procedure*

The focus consisted of 6 participants, 1 moderator and 1 assistant. The moderator introduced herself and informed the participants about the project and explained the term 'climate neutral society'. After the introduction, open discussions were encouraged with the help of pre-decided questions to gain information about the participants views of a climate neutral society.

#### *Results*

Concepts concerning a climate neutral society that were mentioned in either of the two focus groups were conducted and sorted by categories depending on whether the words were mentioned as climate positive, more positive than negative, negative or other.

Noticeable is that some of these concepts were broadly discussed in group 1 but not at all or very briefly in Group 2, and vice versa. This was helpful when picking out concepts to make sure that all concepts used in the IAT had been discussed within both groups.

The focus groups showed that although some differences were found between the groups, the participants in both groups, independent of nationality, had similar views of climate issues of today and what a climate neutral society might look like.

### Design of implicit association test

The IAT consists of seven steps, each step consisting of one block of stimuli, as can be seen in Table 1. Table 2 shows the final set of concepts that were used in the IAT.

Table 1
*Overview of IAT*

| Block | Block type | Category | # of trials |
|---|---|---|---|
| 1 | Categories practice | 'Me' and 'Others' | 20 |
| 2 | Attributes practice | 'Climate Positive' and 'Climate Negative' | 20 |
| 3 | Compatible test | 'Me/Climate Positive' and 'Others/Climate Negative' | 20 |
| 4 | Compatible test | 'Me/Climate Positive' and 'Others/Climate Negative' | 40 |
| 5 | Categories reversed practice | 'Others' and 'Me' | 40 |
| 6 | Incompatible test (categories reversed) | 'Others/Climate Positive' and 'Me/Climate Negative' | 20 |
| 7 | Incompatible test (categories reversed) | 'Others/Climate Positive' and 'Me/Climate Negative' | 40 |

## Materials

### Apparatus

The IAT was conducted using the script Open Source Implicit Association Test version 1.2.1 (2018) in the PsychoPy version 3.0.7 (2019) open sourced application. All the instructions for the IAT were given within the application, to ensure that the instructions were the same for all participants. The response for categories on the left side of the display was answered using the left index finger on the key E, and categories on the right side were chosen using the right index finger on the key I.

### Implicit Association Test stimuli

The IAT had two categories; 'Me' and 'Others', and two attributed; 'Climate Positive' and 'Climate Negative'. Stimuli for the categories consisted of twenty words; five words each for the different categories and attributed. The words for 'Me' and 'Others' were taken from previous studies (Schultz, Shriver, Tabanico & Khazian, 2004; Bruni & Schultz, 2010, Schultz & Tabanico, 2007), while the words for the 'Climate Positive' and 'Climate Negative' attributes were selected from the list of words that was found when analysing our focus groups with respect to frequency, prevalence and syllables.

Table 2
*Final set of concepts*

| Me | Others | Climate Positive | Climate Negative |
|---|---|---|---|
| Me | Others | Recycle | Emissions |
| Mine | Their | Forest | Automobile |
| Myself | They | Organic | Pollution |
| Self | Them | Renewable | Plastic |
| My | Themselves | Second hand | Consumption |

### Explicit questionnaires

The explicit questionnaires were created and incorporated into the test in order to see if there were any correlations between the implicit and explicit attitude toward the self and the climate, which earlier studies have shown (Schultz, 2001; Schultz, 2002).

### New Ecological Paradigm

The New Ecological Paradigm (NEP) questionnaire, taken directly from the study by Dunlap et al. (2000), was designed so that participants agree or disagree with specific statements regarding the climate.

### Personal explicit questionnaire

A personal explicit questionnaire was created for this study and inspired by the questionnaire used in Bruni and Schultz's (2010) study. The questionnaire consisted of questions about how important they estimate certain aspects are in order to create a climate neutral society, how difficult it would be for them to change those aspects and who has the responsibility to change these.

## Procedure

The participants were asked to answer the two questionnaires, one before the IAT and one after. Before starting the IAT, all participants were shown a paper with a table containing the categories and attributes presented with their respective words. This was to make sure all participants understood the chosen words for the test.

## Analysis

### Implicit Association Test

The results from the IAT were used to calculate a D-score by dividing the difference between all test blocks means by the standard deviation of the latencies that are in each block (Greenwald, Nosek & Banaji, 2003). For this study, a higher positive D-score would signify a stronger association between 'Me/Climate Positive' words, which in turn mean that the participant in question is more eager to see themselves as climate positive and others as climate negative. A negative D-score would signify a higher association for 'Others/Climate Positive' and 'Me/Climate Negative'. The data was processed using a script in the program RStudio 1.2.1 bundled with and created for the specific IAT script in order to summarize data from each participant. The results for the two groups were summarized separately and then analysed in SPSS with an Independent Samples *t*-test.

### *New Ecological Paradigm*

For the NEP-questionnaire, the answers were converted to percentages of how climate positive the participants' explicit attitudes were towards every question in the questionnaire. The participants answered on a scale from 1 to 5, where 1 was 'Strongly Agree' and 5 was 'Strongly Disagree'.

The average percentage was calculated for every participant and all the questions respectively. This resulted in one value telling the average climate positivity of each participant, and one value telling the average climate positivity of each question.

This was done for both groups separately, and then calculated in SPSS to get the correlation between this questionnaire and the IAT, as well as the correlation between this questionnaire and the Personal explicit questionnaire. An Independent Samples *t*-test was used to calculate the difference between the average of the two groups.

### *Personal explicit questionnaire*

The answers for the explicit questionnaire were converted to values that could easily be compared to the other results, that is a scale from 1 to 5. Regarding the data for the question of how important certain behavioural changes are, 1 signified 'Not Important' and 5 signified 'Supremely Important'. For the question of how difficult something would be, 1 signified 'Very Difficult', and 5 signified 'Very Easy'.

SPSS was then used to calculate the correlation between this questionnaire and the IAT, as well as the correlation between this questionnaire and NEP. An Independent Samples *t*-test was then used to calculate the difference between the average of the two groups.

# RESULTS

## Implicit Association Test

The results from the IAT showed that the D1-values for the Swedish group ($M$ = .540, $SD$ = .404) had a bias of positive character, which means that the group was biased to associate themselves with the climate-positive words and/or others with the climate-negative words.

The D1-values for the Indian group ($M$ = .197, $SD$ = .368) showed that they had a positive bias, however, the results also showed that, on the level of the individual, a few participants had a bias of negative character; four of the twenty test participants were consequently biased to easier associate themselves with climate-negative words (see Table 3).

Table 3

*IAT individual scores per participant*

| | Indian group | Swedish group |
|---|---|---|
| **Positive bias** | 16 | 20 |
| **Negative bias** | 4 | 0 |

An Independent Samples *t*-test on the Personal explicit questionnaire indicated no significant difference between the Swedish group ($M$ = .830, $SD$ = .117) and the Indian group ($M$ = .850, $SD$ = .110), $t(38)$ = .556, $p$ = .582. The same thing was true for the NEP questionnaire, which indicated that there was no significant difference in the mean for the Swedish group ($M$ = .833, $SD$ = .076) compared to the Indian group ($M$ = .801, $SD$ = .086), $t(38)$ = -1.221 $p$ = .230. When measuring the Independent Samples *t*-test for the implicit test however, the D1-value indicated a significantly higher positive bias for the Swedish group ($M$ = .458, $SD$ = .269) than the Indian group ($M$ = .248, $SD$ = .267), $t(38)$ = -2.485, $p$ = .017.

## New Ecological Paradigm

The results from the NEP showed that the Swedish group had a slightly higher percentages ($M$ = 82.90, $SD$ = 9.45) than the Indian group ($M$ = 79.55, $SD$ = 9.53).

## Personal explicit questionnaire

On the first question on how important certain implementations would be to achieve a climate neutral society the Swedish participants ($M$ = 4.32, $SD$ = .39) generally rated all objects as slightly higher in importance than the participants in the Indian group ($M$ = 3.63, $SD$ = .41). The objects that the participants classified as their own responsibility was rated as having the lowest importance for creating a climate neutral society by both groups. The objects that the participants rated as supremely important was mainly what they themselves rated as someone else's responsibility to implement.

When rating how difficult these implementations would be to implement in their everyday life no mean was lower than a 2.8 score, meaning that no object was rates as difficult to implement. The Swedish group generally thought the objects would be easier to implement ($M$ = 3.92, $SD$ = .53) whilst the Indian group had slightly lower (harder) ratings ($M$ = 3.78, $SD$ = .56). The Swedish groups rated the items that they categorized as someone else's responsibility to implement as the most difficult, while the objects they categorized as their own responsibility as relatively easy. The Indians on the other hand rated the objects the other way around.

# DISCUSSION

There seem to be no correlation between explicit and implicit attitudes towards the climate neutral concepts in the test. Therefore, what you explicitly say about yourself in concern to the environment does not predict any particular type of implicit attitude. In the IAT we account for self and others as the categories, this means that when you have a positive bias int eh IAT you tent to associate 'self'-words with 'Climate Positive'-words. That automatically means that you tend to associate the other category 'Others' with the other attribute 'Climate Negative'. A negative bias therefore means that you have a bias towards associating the 'Climate Positive' concepts more to the category 'Others'. The latter only occurred in the Indian group.

This difference is also enhanced by the results from the personal explicit questionnaire. This study shows that the two groups associated the concepts differently in accordance to responsibility for these changes (read: climate neutral concepts). The conclusion being that in both the IAT and the personal explicit questionnaire the Indians seemed to be more biased to associate environmental positive words to others rather than to themselves. At the same time, they also thought these solutions would be the most important and easiest to implement in society. This study claims that the aspect of perceived control that, according to Grob (1995) is a building block of an attitude, could be connected to the feeling of accountability. Meaning that the Swedish group that, in the completely opposite manner, rated the objects they saw themselves responsible for as the easiest to implement might indicate that they have a stronger perceived control and therefore also get a stronger positive bias on the IAT.

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