The Effect of Linguistic Relativity on Intertemporal Decision-Making: The Implementation of Climate Change Legislation

Isabelle MacLean

University of Saskatchewan

THEORETICAL INTRODUCTION

The theory of linguistic relativity discussed hereinafter relies on the distinction between languages which apply only present tense versus languages which apply future and present tense in habitual conversation. This is known as Future-Time Reference ("FTR").

	French	Finnish
Present	Il fait chaud aujourd'hui	Tänään on kuuma
	It do/make.PRS hot today	Today be.PRS hot
	'It is hot today'	'It is hot today'
Future	Il fera chaud demain	Huomenna on kuuma
	It do/make.FUT hot tomorrow	Tomorrow be.PRS hot
	'It will be hot tomorrow'	'It is hot tomorrow'

In economics, this has been known to create divergent behavior where present costs yield future rewards. The economic effects include: utility framing, and probability function.

Utility Framing

Utility framing refers to the perception of distance to the future. In this case, those who speak languages which only rely on present tense (weak-FTR) perceive the future to be closer than those who speak languages which have both future and present tense (strong-FTR). Languages which have infrequent/optional use of future tense (medium-FTR) have also experienced similar effects to weak-FTR.

Probability Function

Probability function refers to the intertemporal awareness of language speakers. Those who speak weak-FTR languages have a systematically lower ability to be precise about a time of future reward when compared to strong-FTR language speakers.

HYPOTHESIS

I purport that countries with majority populations who speak weak future-time reference languages will have a greater likelihood of implementing climate change legislation domestically than those who speak strong future-time reference languages.

In order to demonstrate this, I will apply the theory of linguistic relativity to the implementation of domestic climate change legislation internationally following the Kyoto Protocol.

METHODS

Why The Kyoto Protocol

The Kyoto Protocol was global in reach and has seen its term of intended implementation come and go. This means that there is a more wholesome view of all implementation undertaken in that time period.

Choice of Climate Index

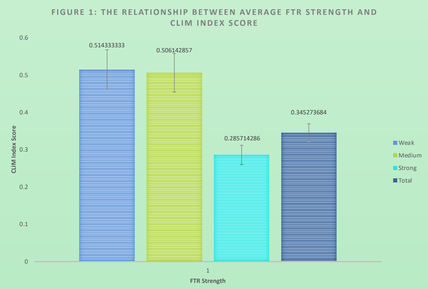
The Climate Change Performance Index ("CLIMI") is chosen for this analysis. It is favorable for this analysis as it only represents climate change legislation implemented, and not their effective results. This helps contain the intervening factors, where some countries have a better advantage in policy efficacy.

Languages Chosen

53 languages were self-classified into three categories: weak, medium, and strong-FTR. Sample sizes of countries with these languages as their majority language were 18, 7 and 70 respectively. Weak and medium-FTR languages are examined separately until statistics indicate they are homogenous.

RESULTS ON FTR STRENGTH

FIGURE 1: THE RELATIONSHIP BETWEEN AVERAGE FTR STRENGTH AND CLIM INDEX SCORE



There is a visual distinction between mean of strong-FTR and mean of weak-FTR. Medium and Weak-FTR indicate similarities conducive to category assimilation in favour of sample size.

CLIM Index distribution	Weaker-FTR	Strong-FTR	Total
Top third actual	16.666667	15	31.666667
Top third expected	7.9	22.2	
Middle third actual	5.666666	26	31.666667
Middle third expected	7.9	22.2	
Bottom third actual	2.666667	29	31.666667
Bottom third expected	7.9	22.2	
Total	25	70	95

Chi-squared analysis rejects the null hypothesis and confirms that there is association present between Weaker-FTR and higher implementation of climate change legislation at a 95% confidence rate.

$$\ln(CLIM\ Score) = \alpha_o + \alpha_1 FTR$$

Logarithmic regression analysis allows for consideration of intervening factors as well as magnitude, unlike chi-squared significance. Analysis confirms statistical significance and that the magnitude of the direct effect of FTR strength on climate change legislation implementation is 19% in favour of the hypothesis.

RESULTS ON INTERVENING FACTORS

GDP per Capita

$$\ln(CLIM\ Score) = \alpha_0 + \alpha_1 * lnGDP$$

There is a direct relationship between GDP per Capita and climate change legislation implementation.

$$\ln(CLIM\ Score) = \alpha_0 + \alpha_1 * FTR + \alpha_2 * lnGDP$$

FTR and GDP per Capita are not likely to share any common factors.

$$\ln(CLIM\ Score) = \alpha_0 + \alpha_1 * FTR + \alpha_2 * lnGDP + \alpha_3 * FTR * lnGDP$$

FTR has no indirect impact on the relationship between climate change legislation implementation and GDP per Capita.

Percent of Population Receiving Climate Change Education

$$\ln(CLIM\ Score) = \alpha_0 + \alpha_1 * lnClimedu$$

There is a direct relationship between Climate Education and climate change legislation implementation.

$$\ln(CLIM\ Score) = \alpha_0 + \alpha_1 * FTR + \alpha_2 * lnClimedu$$

FTR and Climate Education are not likely to share any common factors.

$$\ln(CLIM\ Score) = \alpha_0 + \alpha_1 * FTR + \alpha_2 * lnClimedu + \alpha_3 * FTR * lnClimedu$$

FTR has no indirect impact on the relationship between climate change legislation implementation and Climate Education.

CONCLUSION/FINDINGS

1. Weaker-FTR language speaking countries are more likely to implement climate change legislation than strong-FTR language speaking countries.
2. FTR has a direct effect on a country's likelihood to implement climate change legislation by a magnitude of 19%.
3. The intervening factors have a mutually exclusive effect on the implementation of climate change legislation.

NEXT STEPS & RESEARCH LIMITS

1. Due to an overall lack of sample size pertaining to weaker-FTR countries, there may be a reduced ability to generalize data.
2. It may be of interest to further consider what the effect of bilingual countries are on the results – specifically as it pertains to countries with two main languages where one is weaker-FTR and the other is strong-FTR.
3. It may be of interest to consider the effect of the appearance of fairness as a theory of behavioral economics on the likelihood of implementation to rule out further intervening factors.

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