
| RESEARCH ARTICLE

An Attitudinal Analysis of NPR's Carbon-reduction Reports

Xiaoling Lin

Jinan University, Guangzhou, China

Corresponding Author: Xiaoling Lin, **E-mail:** 760101635@qq.com

| ABSTRACT

Under the framework of the Appraisal System, this paper conducts a discourse analysis on NPR's carbon-reduction reports to investigate the distributional features of attitudinal resources and how the resources are adopted to convey ecological values and stances in the reports. Attitudinal resources are manually annotated on UAM Corpus Tool 6, the distributional features of which will be analyzed and combined with the statistical results. The findings demonstrate that in the reports, sub-types of resources are adopted for different purposes. Affect resources are mainly used to show the intensity of a country's resolution to tackle climate-change issues, while judgement resources are mostly directed towards a country's ability and commitment to deal with climate change, and appreciation resources are adopted to give twofold responses about the feasibility and reliability of specific climate change plan. By conducting an attitudinal analysis of NPR's carbon-reduction reports, the study reveals the ecological stance and value of NPR on carbon-reduction. Combining the theoretical framework of the Appraisal System, this paper also provides a new perspective for discourse analysis on environmental reports.

| KEYWORDS

Attitudinal Analysis; Appraisal System; Carbon-reduction; Discourse Analysis

| ARTICLE INFORMATION

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1. Introduction

As Halliday (1992) points out, "Language does not passively reflect reality, but it actively creates reality." Since the 1970s, scholars began to recognize this interactive feature of language and began to investigate the dynamic relationship between language and the environment, probing into how language reflects and influences the environment.

The interaction of language and the environment brought forth the birth of Eco-linguistics, which is an interdisciplinary study studying the role of language in the life-sustaining interactions of humans with other species and the physical environment (Stibbe, 2021). Evolving from Halliday's Eco-linguistic approach, EDA (Ecological Discourse Analysis) is a major paradigm of Eco-linguistics, conducting an ecological analysis of discourse to explore the ecological orientation of the investigated texts. (Huang Guowen & Zhao Ruihua, 2017; He Wei, 2021).

NPR is one of the leading media organizations in America with wide reaching influence and a large set of audience, whose articles have wide-ranging influences and which has research significance for investigating attitudes towards carbon-reduction.

This paper, based on an appraisal system and through the discourse analysis of attitudinal resources in carbon-reduction articles of NPR, aims to explore the media's environmental values and stance on the issue of carbon-reduction.

2. Literature Review

Since the mid-1990s, discourse analysis has become an increasingly established framework for solving environmental issues (Leipold, Feindt, Winkel & Keller, 2019). Scholars concluded the achievements and challenges to discourse analysis in environmental policy and planning (Feindt & Oels (2005), and with the theories and methodologies of discourse analysis, scholars approach environmental issues in two ways: to investigate environmental values or to assess or research environmental policies (Sharp & Richardson, 2001).

For analyzing and researching environmental policies, scholars like Gellers (2015) have dedicated themselves to devising a framework for applying critical discourse analysis (CDA) to researching environmental laws. Runhaar, Van-Laerhoven, Driessen, and Arts (2013) have adopted the approach of discourse analysis to make an environmental assessment (EA), which dedicates to enhancing environmental awareness and ensuring that environmental values are fully considered in decision-making.

For investigating environmental values or ideologies, Buhr and Reiter (2006) explored how Noranda's environmental reports contribute to and reflect the broader discourse of environmentalism over time along three dimensions of discourse analysis: moral responsibility, empirical objectivity and aesthetic judgement. Mejía-Cáceres, Huérfano, Reid, and Freire (2021) explore how an environmental education policy text comes to be constituted by discursive strategies that reproduce or challenge particular ideologies of environmentalism in relation to education. Jessup (2010) adopted the approach of discourse analysis to identify and define the hybrid and plural values held by the groups within wind energy discourse coalitions.

Theories of systemic functional linguistics have proved themselves great aids in the practice of discourse analysis, serving as a useful tool for scholars hoping to discover underlying ideologies and build eco-friendly discourse. Based on the systemic functional grammar, scholars have undertaken discourse analysis from aspects of transitivity (Dai Guiyu and Chou Juan, 2012; Yu Hui and Wang Liping, 2020; Dong Dian, 2021), clausal analysis (Zhao Ruihua & Chen Yumin, 2016), register (Huang Guowen & Chenyang, 2017; Dong Dian, 2021), genre, metafunctions, mood, modality, thematic structure (Huang Guowen & Chenyang, 2017), appraisal system (Li Shujing Liu Chengyu, 2020; Dai Guiyu and Chou Juan, 2012; Dong Dian, 2021), and Halliday's Marxist ecological view (Zhao Ruihua, 2020).

To better explore the ecological values, scholars of functional linguistics have revised the original framework specifically for analysis from the ecological perspective. They have adapted frameworks in various aspects of transitivity (He Wei & Wei Rong, 2017), appraisal system (Wei Rong and He Wei, 2019; He Wei & Ma Zijie, 2020), mood, modality, theme system (He Wei & Ma Chen, 2020b; He Wei & Zhang Ruijie, 2017), the information system (He Wei & Zhang Ruijie, 2017), and the that of cohesion and coherence (He Wei & Ma Chen, 2020a), providing abundant tools for future ecological analysis.

3. Theoretical Framework

This paper chose the appraisal system as its theoretical framework.

The appraisal system is developed by Martin & Rose (2003:26) and Martin & White (2005:38) as a supplement to the interpersonal meaning, one of the three meta-functions in Systemic Functional Grammar, which is concerned with the interactive part of the language with which we interact with other people and negotiate social relationships (Halliday & Matthiessen, 2013:30, Thompson, 2013:45)

As discourse semantic resources for negotiating attitudes, the appraisal system is organized into three semantic regions, namely, "attitude", "engagement", and "gradation". (Martin & White, 2005: 34). Of these resources, attitude represents the core of the system, and is concerned about emotions, whereas engagement deals with how attitude is sourced and gradation involve the amplification of attitude. Attitude is part of appraisal resources which are concerned with our feelings, including emotional reactions, the judgement of behaviors and evaluation of things. (Martin & White, 2005: 34) Out of the three major sets of appraisal, attitude lie at the core, whereas engagement locates its source and gradation investigates how it is amplified. Attitude, in turn, can be grouped into three interactive domains, namely, "affect", "judgement", and "appreciation". Affect refers to linguistic resources for expressing feelings and construing reactions. Judgement focuses on resources for judging and assessing characters based on various normative principles. Appreciation investigates resources for valuing the worth of things, including natural phenomena.

This paper conducts an analysis of attitudinal resources on NPR Carbon-reduction reports on the basis of the attitude subsystem of the appraisal system proposed by Martin & White (2005:38), the framework as illustrated in Figure 1.

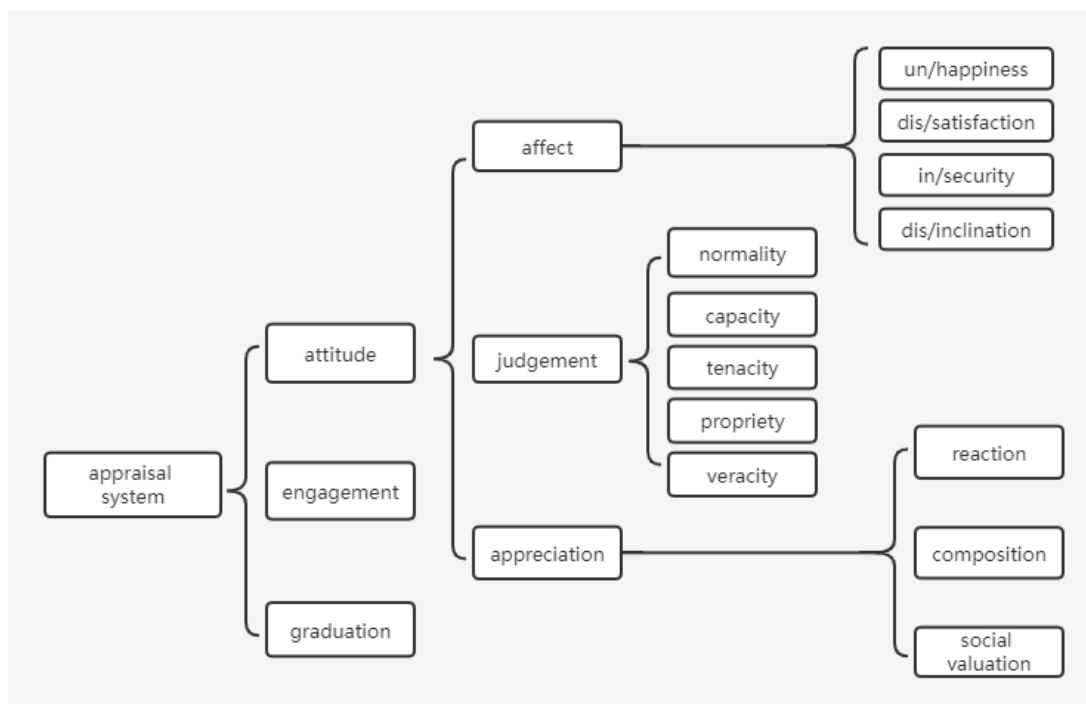


Figure 1. Appraisal System (Martin & White, 2005:38)

4. Methodology

The study is both qualitative and quantitative. Selecting UAM Corpus Tool 6 as its research tool, this study chose a total of 10 pieces of news writing on the topic of carbon reduction from NPR, which are then used to establish a set of self-built corpus to conduct the analysis.

The research procedure was as follows:

Firstly, a project inside the software, consisting of the self-built corpus from NPR, was created.

Secondly, a layer of the theoretical framework was established in the software based on the appraisal system.

Thirdly, manual annotation is conducted in the software to annotate attitudinal resources employed in the selected articles.

Last but not least, the statistics function of UAM Corpus Tool 6 is employed to make statistical analyses of the attitudinal resources in the selected news articles.

After obtaining descriptive data through quantitative research, this thesis further analyzes and discusses the use and distribution of attitudinal resources combining the method of qualitative research.

5. Data Analysis and Results

5.1 Distribution of Attitudinal Resources

ATTITUDE-TYPE	N	%
- affect	20	16.5
- judgement	46	38.0
- appreciation	55	45.5
TOTAL:	121	100.0%

Figure 2. Distribution of attitudinal resources in NPR articles

As is shown in the statistics in Figure 2, the distribution of attitudinal resources in NPR's carbon-reduction articles shows an uneven distribution, with appreciation resources taking up 45.5% of overall attitudinal resources, followed by judgement resources, which accounts for 38% of the total resources. The statistics also show that affect resources take up the least percentage of the three subcategories, accounting for 16.5%.

5.1.1 Distribution of Affect Resources

AFFECT-TYPE2	N	%
- un/happiness	0	0.0
- dis/satisfaction	2	1.7
- in/security	1	0.8
- dis/inclination	17	14.0
TOTAL:	20	16.5%

Figure 3. Distribution of affect resources in NPR articles

Example 1: China **aims to** (dis/inclination, affect) reach a peak in carbon dioxide emissions before 2030 and achieve carbon neutrality before 2060.

Example 2: The action, he [Biden] said, "will demonstrate to the world" that the U.S. is "not only back at the table" but will **"hopefully** (disinclination, affect) lead by the power of our example."

As can be known from the above analysis, affect resources takes up the least percentage of 16.5% in overall attitudinal resources, and as is shown in Figure 3, the affect resources in the selected NPR articles mainly fall into the subcategory of dis/satisfaction, while the remaining affect resources fall into the subcategory of in/security and dis/dissatisfaction.

The subject of evaluation for affect, as can be shown in Example 1, is China. Example 1 shows the inclination and determination of China to reach its aim of carbon-reduction and achieve carbon neutrality. On the other hand, the object of evaluation for affect, as shown in Example 2, is Biden, the US president. Although the emotional orientation is not as severe, affect resources are used in this example to show the country's belief and resolve in carrying out carbon-reduction plans.

Affect resources, in these cases, are mainly adopted to show the intensity of the countries' determination. More specifically, their commitment and dedication to carrying out specific carbon-reduction packages or to reaching carbon-emission aims.

5.1.2 Distribution of judgement Resources

JUDGEMENT-TYPE	N	%
- normality	9	7.4
- capacity	14	11.6
- tenacity	13	10.7
- propriety	9	7.4
- veracity	1	0.8
TOTAL:	46	38.0%

Figure 4. Distribution of judgement resources in NPR articles

Example 3: There's a lot more work ahead; while Biden cast the summit as a historic inflection point, his top national security adviser, Jake Sullivan, **had a more pragmatic take** (normality, judgement), saying that Glasgow was only a starting point to reach climate goals.

Example 4: Biden's national climate adviser, Gina McCarthy, earlier said that the carbon reduction plan "illustrates how, within three decades, the U.S. **can** (capacity, judgement) meet our global climate commitments by decarbonizing the power sector, electrifying transportation and buildings, transforming industry, reducing non-CO2 emissions, and reinvigorating our natural lands."

Example 5: Biden also **plans to** (tenacity, judgement) launch a new program to help developing countries adapt to climate change that he hopes will provide \$3 billion in financing per year by fiscal 2024, the White House said.

Example 6: "**Can** (propriety, judgement) those countries step up? **How fast** will they step up? **What** will they pledge to do over the course of the next years?"

Example 7: The U.S. announced its plan a day after the United Nations took aim at companies that use "**dishonest** (veracity, judgement) climate accounting" practices.

Figure 4 shows that the distribution of judgement resources in NPR's carbon-reduction articles is relatively even, except for the case of "veracity", which takes up only 0.8%.

"Veracity" is a judgement device used to show the truthfulness and honesty of the object of evaluation, the only example of which in the NPR articles is shown in Example 7, indicating the critical stance toward the dishonest behavior of certain companies in the practice of the counting system of carbon emission.

The judgement subcategories mostly adopted are, as in Figure 4, capacity, which is used to reflect the evaluation of ability, followed by tenacity, which is used to show assessments of psychological dispositions of determination or resolve. Example 4, an example of capacity, shows how judgement resources are used to show confidence in a country's (i.e., the U.S.)'s ability to meet climate challenges, while Example 5 is an example of how judgement resources are used to show the commitment of the U.S to shoulder the global responsibility of helping developing countries adapt to climate changes.

The categories of "normality" and "propriety" both take up 7.4% of overall attitude resources. Whereas "normality" is used to assess how special or unusual a certain behavior or action is, "propriety" is used to assess the ethical or moral standing of a certain person or party. While Example 3 indicates the media's critical and negative comment on Biden by appraising another figure, Example 6 illustrates an urgent call for more countries to step up in managing climate change.

After the analysis of the distribution and examples of subcategories of judgement resources, we can see that in NPR articles, judgement resources are used twofold. On the one side, they show the positive determination of a country (the US) to deal with climate change and its determination to carbon-emission. On the other side, they show mainly negative responses and comments on the commitment of the US.

5.1.3 Distribution of Appreciation Resources

APPRECIATION-TYPE	N	%
- reaction	23	19.0
- composition	21	17.4
- social-valuation	10	8.3
TOTAL:	54	44.6%

Figure 5. Distribution of appreciation resources in NPR articles

Example 8: Biden touted his legislative proposals, still awaiting passage by his fellow Democrats in Congress, that would allocate more than \$500 billion to addressing climate change, which he called "the most **significant** (reaction, appreciation) investment to deal with the climate crisis that any advanced nation has made. Ever."

Example 9: Rachel Cleetus of the Union of Concerned Scientists said it's **inconsistent** (composition, appreciation) with the need to make "steep, absolute emission reductions as soon as possible" in order to limit global warming.

Example 10: President Biden pledged sharp cutbacks in U.S. carbon emissions, telling delegates to the U.N. climate summit in Glasgow, Scotland, on Monday that "**there's no more time to hang back or sit on the fence or argue among ourselves** (social valuation, appreciation)."

It can be seen in Figure 5 that appreciation resources in NPR's carbon-reduction articles mainly belong to the subcategory of "reaction" and "composition", with "reaction" referring to the emotional reaction caused by something or someone and "composition" describing how well things fit together.

As an example of "reaction", Example 8 is used to show Biden, the US president's comment on the investment to address climate change, the subject of the appreciation being the president and the object being a concrete climate solution or plan.

Example 9, on the other hand, is an example of "composition", which is used to show an official's negative comment on current climate-change schemes. The subject of the evaluation is a concerned party, and the object is a certain climate-change solution.

Last but not least, Example 10 is an example of the subcategory of "social valuation", which is used to show how something is "socially" valued. In this example, Biden is informing the public of the importance of dealing with climate issues. Unlike other categories, this category is used to stress its importance from the perspective of social values.

The above examples show that appreciation resources in NPR's carbon-reduction articles are usually directed at the positive and negative comments on a specific climate-change initiative or an urgent call on the public to deal with the current climate situation, stressing its importance from the perspective of social values.

5.2 Polarity of Attitudinal Resources

ATTITUDE-POLARITY	N	%
- positive-attitude	70	57.9
- negative-attitude	32	26.4
- neutral	18	14.9
TOTAL:	120	99.2%

Figure 6. Polarity of Attitudinal Resources in NPR articles

Figure 6 tells us that in NPR's carbon-reduction articles, attitudes are most positive, taking up 57.9% of total attitudes. The figure is followed by negative attitudes, which take up 26.4% of overall attitudes. Neutral attitudes, which do not show much orientation or preferences, take up 14.9% of all attitudes.

5.2.1 Analysis of positive attitude

Example 11: Those transactions would create a **reliable** (positive, attitude) source of money for low-income countries, which they could use to obtain additional private funding on favorable terms, the U.S. State Department said in a statement.

Example 12: Biden's national climate adviser, Gina McCarthy, earlier said that the carbon reduction plan "illustrates how, within three decades, the U.S. **can meet** (positive, attitude) our global climate commitments by decarbonizing the power sector, electrifying transportation and buildings, transforming industry, reducing non-CO2 emissions, and reinvigorating our natural lands."

Example 11 and Example 12 tell us the main object for a positive attitude in NPR's carbon-reduction articles: a concerned party or an agent involved in managing the climate-change crisis, showing confidence and positive comments on the reliability and confidence in conquering climate-change situations.

Example 11 is a statement made by the U.S State Department to ensure the public of the feasibility and reliability of the government's ability and dedication to commit to dealing with climate change, trying to convince the public of the thoughtfulness of their climate change initiative.

Example 12 is a positive forecast of how the US is going to perform in the global climate commitments of carbon reduction. This shows the attitude of the relevant party toward the government's ability and commitment.

It can be seen that positive attitudes, which take up the most percentage in NPR's carbon-reduction articles, are mostly directed at two aspects: a country's confidence in its plan to tackle climate-change issues or a concerned professional's positive forecast of how countries will perform in the act of dealing with climate-change.

5.2.2 Analysis of negative attitude

Example 13: Some climate experts said the plan is still **problematic** (negative attitude).

Example 14: A plan the United States floated Wednesday to increase private investment in clean energy in low-income countries is being met with **skepticism** (negative attitude) from financial experts and environmentalists.

Example 13 and Example 14 show negative attitudes were both used to show doubt and skepticism about a certain climate change plan.

Although the negative evaluations share the object, i.e., the aforementioned climate package, the subject are from concerned climate experts, financial experts and environmentalists. The diversity of the source shows how a climate change plan, which is portrayed positively by its initiators, is being received by the public and the responses it illicit.

The negative attitude in NPR's carbon-reduction articles shows how a climate change plan is being perceived by the public and the challenge it raises to the authority. The different sources of negative comments directed at the same event also lead readers to rethink the feasibility of the aforementioned plan.

5.3 Discussion

After an analysis of attitudinal resources from the aspect of distribution and polarity, the paper finds attitudinal resources are abundantly used in the articles.

As far as distribution is concerned, the result shows that attitudinal resources in NPR's carbon-reduction articles show an uneven distribution, with appreciation resources taking up 45.5% of overall attitudinal resources, followed by judgement resources, which account for 38% of the total resources. The statistics also show that affect resources take up the least percentage of the three subcategories, accounting for 16.5%.

Affect resources are mainly adopted to show the intensity of emotions. More specifically, to demonstrate the countries' determination, that is, their commitment and dedication to carrying out specific carbon-reduction packages or to reaching carbon-emission aims.

Judgement resources are used twofold. On the one side, they show the positive determination of a country (the US) to deal with climate change and its determination to carbon-emission. On the other side, they show mainly negative responses and comments on the commitment of the US.

Appreciation resources in NPR's carbon-reduction articles are usually directed at the positive and negative comments on a specific climate-change initiative or an urgent call on the public to deal with the current climate situation, stressing its importance from the perspective of social values.

On the side of the polarity, in NPR's carbon-reduction articles, attitudes are most positive, taking up 57.9% of total attitudes. The figure is followed by negative attitudes, which take up 26.4% of overall attitudes. Neutral attitudes, which do not show much orientation or preferences, take up 14.9% of all attitudes.

It can be seen that positive attitudes, which take up the most percentage in NPR's carbon-reduction articles, are mostly directed at two aspects: a country's confidence in its plan to tackle climate-change issues or a concerned professional's positive forecast of how countries will perform in the act of dealing with climate-change.

The negative attitude in NPR's carbon-reduction articles shows how a climate change plan is being perceived by the public and the challenge it raises to the authority. The different sources of negative comments directed at the same event also lead readers to rethink the feasibility of the aforementioned plan.

6. Conclusion

Adopting the appraisal system of Martin & White (2005) as the theoretical framework and selecting carbon-reduction reports from NPR, this paper conducts a discourse analysis on *the* selected articles to investigate the distributional features of attitudinal resources and how they are adopted to convey voices in the reports.

After a quantitative and qualitative analysis of attitudinal resources in the articles, the paper finds that in these articles, attitudinal resources show an uneven distribution, with appreciation resources taking up 45.5%, judgement resources accounting for 38% and affect resources taking up 16.5%.

Apart from the distributional difference, the paper also finds that sub-types of attitudinal resources are adopted for different purposes. While affect resources are mainly used to show the intensity of a country's resolution to tackle climate-change issues, judgement resources are mostly directed towards a country's ability and commitment to deal with climate change. Last but not least, appreciation resources are adopted to give twofold responses about the feasibility and reliability of specific climate change plans.

By conducting an attitudinal analysis of NPR's carbon-reduction reports, the study reveals the ecological stance and value of NPR on carbon-reduction and how attitudinal resources are adopted to convey their voice. Combining the theoretical framework of the Appraisal System, this paper also provides a new perspective for discourse analysis on environmental reports.

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