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RESEARCH ARTICLE

# The Temporal Construction of Fossil Fuel Threat in WHO Reports: A Corpus-Based Cognitive Pragmatic Study

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## ABSTRACT

The World Health Organization (WHO) monitors public global health and tries to assist vulnerable populations in their pursue to achieve optimal health. WHO has always voiced concerns regarding health and environmental impacts of fossil fuel consumption. Reviewing WHO website shows various reports on fossil fuel impacts from multiple perspectives. The paper aims to examine the temporal construction of fossil fuel threat in WHO reports. Such construction aims to encourage people to take preventive measures within time span that precedes the impact of the threatening element. To accomplish this aim, the paper employs Cap's (2013, p. 16) temporal proximization strategy as a component of the proximization theory of crisis and threat construction. The methodology is both qualitative and quantitative, using corpus linguistics. AntConc (2019) software is used to perform corpus procedures, such as word lists, file views, concordances, wildcards, and file views tools. The corpus consists of a set of WHO reports on fossil fuel adverse effect compiled by the researchers. The results show that WHO reports employ various linguistic choices to construe the temporal proximization of fossil fuel. These linguistic choices are used at different rates to achieve cognitive-pragmatic objectives.

**Keywords:** Cognitive pragmatics, Fossil fuel, Proximization theory, Temporal proximization, WHO reports

## 1. Introduction

Recently, access to electricity, as a kind of inexpensive energy, has become the basic to economy. Widely available and affordable electricity has become essential since society depends on having electricity accessible all the time. If power is disrupted (even briefly), significant societal disruptions may occur. In high-income countries, the on-going supply of inexpensive electricity is usually taken for granted. Such availability is achieved by supply resources which provide abundant and inexpensive coal or natural gas to power plants to enable them to frequently deliver affordable electricity around the day. Electricity supply has become the essential backbone that supports everyday functions and prosperity of societies [12].

With the almost depletion of inexpensive and easily accessible fossil fuels, significant global movements have emerged advocating for complete shift to other renewable energy sources. Business leaders, politicians, and other people are now proactively working to achieve the goal of complete renewable energy systems. Climate change concerns are no longer exclusive to the West. Rather, it has become a focal point in countries such as India and Chin. Many populations started to call for clean energy revolution and many governments started acknowledging urgent needs to move to low-carbon systems of energy as quickly as possible. The aim is to reduce gas emission and mitigate the impact of climate change. It has become a global consensus that promotes the shift to a sustainable energy future. There is a tendency to

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move away from the dependence on environmentally-damaging fossil fuels [12].

The World Health Organization (WHO) has already expressed many concerns about the environmental and health effects of fossil fuel consumption. WHO is a specialized United Nations agency that monitors international public health, safety, and assists the vulnerable so that the world population can attain optimal health. Surveying WHO website, one can find many reports on fossil fuel effects that tackles the issue from different perspectives.

Since language is a cognitive means of communication, there exists an intricate and multifaceted relationship between language and thought. Language is a medium for expressing, shaping and organizing thought. At the same time, thought processes influence both language production and comprehension ([8], p. 15). In addition to thought, cultural norms and values play a role in shaping language which, by its turn, shapes the way people interpret and perceive the world. Thus, language can reveal a great deal of human cognition. It embeds implied and explicit meanings that mirror the individuals' thoughts and beliefs [18].

WHO has always assured that burning fossil fuels contributes to air pollution which is one of the threats to global health. Exposure to polluted air is associated with growing risk of heart disease, respiratory diseases, lung cancer and stroke. Moreover, WHO has recognized that the extraction, transportation, and combustion of fossil fuel release greenhouse gas emissions which lead to climate change that represents a serious threat to public health [19]. Accordingly, WHO has advocated for the rapid global transition from fossil fuels to cleaner renewable energy sources. In addition, WHO has urged policymakers to adopt taxes, strong regulations and other procedures so as to discourage the use of fossil fuel and shift to sustainable energy [20]. Obviously, WHO considers fossil fuels as a serious threat to public health and has called for accelerated action to gradually remove them in favor of other renewable energy sources in order to protect the environment and human health.

Temporal factors of exposure to residues from burning fossil fuels play key roles in the adverse effects of these residues on health and environment. Duration of exposure to fossil fuels residues in the areas where the consumed quantities increase is a vital reason of many diseases. Temporal issues in this respect are heavily relied upon in WHO reports to explain how and when fossil fuel residues affect both the environment and human bodies. Thus, the present paper aims to explore the temporal construction of fossil fuel threat in WHO reports. The paper intends to address the question: How and to what extent do WHO reports employ language choices to achieve the temporal construction of fossil fuel threat?

Since fossil fuel residues move across different places within particular times, figuring out the temporal perspectives in this respect help in adsorbing the size of threat. These residues are approaching us and invading our space rapidly. The reduction of time (proximization) by which these harmful residues approach human bodies is a critical concern. Therefore, Cap's [4] theory of proximization has been adopted in the analysis. The theory employs three strategies to construe threat: spatial, temporal, and axiological (ideological). In this paper, the analysis adopts the temporal strategies to answer the research question put forward.

## 2. Proximization theory

Proximization theory is a theory within cognitive pragmatics. As an integral interdisciplinary field, cognitive pragmatics integrates physical and cognitive perspectives of meaning construction through investigating discursive strategies that supply construal indications for the issue under discussion. The ultimate aim is to provide inferential series that are vital elements to figure out the intended meaning of interlocutors in communication. In fact, pragmatics has been of a cognitive tendency since Austin's [1] and Searle's [14] speech acts, Crice's [9] conversational implicature and Sperber and Wilson's [15] relevance theory. What the later cognitive pragmatists did was that they put forward more precise frameworks for the convergence of the interlocutors' cognitive processes with the physical cotextual surroundings in the process of communication. One of these integrating frameworks is Cap's [4] proximization theory of threat, crisis and conflict construction in discourse.

*Proximization* is a rather novel concept in linguistics. It has been introduced through the terms *proximise* and *proximising*. The latter two terms were initially documented in Chilton's [6] work. Later on, *proximization* was coined by Cap [3] to describe the methodical and deliberate employment of cognitive-pragmatic interpretations. It was initially used in political discourse. Then, the term has been used as a methodology of analysis in critical discourse analysis, cognitive-linguistics and pragmatics. It focuses on the way symbolic representation shapes the relationship among entities in a particular Discourse Space (DS), emphasizing the shift where elements on the periphery of the DS are considered as central in the deictic center of Space.

Proximization theory is based on the original notion of proximization. According to Cap [5], proximization calls for "closeness of the external threat in order to solicit legitimization of preventive measures" (p. 281). Cap [4] designed the spatio-temporal-axiological (STA) proximization model that involves

deliberate utilization of specific lexico-grammatical choices which generate from the cognitive categories of location, time and value. This process requires a dynamic and temporally expansive context and is met by these cognitive categories. Consequently, the model is based on an interdisciplinary research that incorporates critical, cognitive, pragmatic, and corpus-based methodologies. The innovative component of proximization theory is that of the lexico-grammatical choices. This component is not found in the other works which try to deal with cognitive vs. pragmatic perspectives [4].

The lexico-grammatical choices are essential since they form the linguistic base of both deictic center and periphery. They maintain the symbolic construal through which peripheral entities cross the distance in the DS to get into the deictic center. The lexico-grammatical choices, and how they correspond to the changing extra-linguistic context, depend on a number of cross-disciplinary premises. It complements with the DS cognitive concept in terms of the offline static pre-existence and the live dynamics of meaning construction by conceptualization. It goes a long with the metaphoric cognitive schemas. In addition, proximization theory assigns linguistic choices for mental representations mappings and so as to pragmatically achieve certain goals. The dynamic features of social and political context consider such goals as the framework of legitimizations. The lexico-grammatical choices combine the pragmatic, cognitive and social input so as to keep up time spans. The choices can reflect the spatial, temporal, and axiological categories by continuously changing percentages. These changes show the changing dimensions of space, time, and value [4].

According to Fig. 1, threat comes from DS-peripheral entities which represent outside-deictic-center entities (ODCs) (such as fossil fuel residues). The ODCs, in conceptualization, are viewed as crossing the Space to attack the inside–deictic-center (IDC) entities (human bodies and heath when it comes to fossil fuel residues). The IDCs represent the interlocutors, i.e. text producers and text receivers. This strategy shows the negative representations of ODC; harmful and threatening to the positively represented IDC). Interlocutors exist within the scope of IDCs. The negative representations of ODCs raise fear to promote preventive measures [5]. In this respect, threat is of spatio-temporal and ideological nature. Thus, proximization is encompassed by three perspectives: spatial, temporal and axiological.

Since Cap's [4] proximization theory represents an innovative framework to cognitive pragmatic studies, the present section attempts to consult and consider some of the cognitive pragmatic studies that utilize

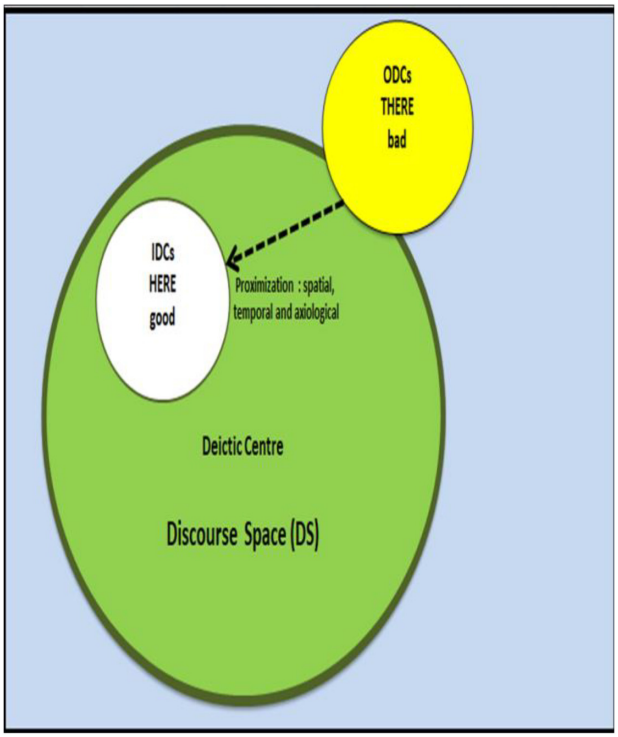


**Fig. 1.** Proximization theory framework.

the proximization theory to explore various meanings in discourse. Ninković (2020) has investigated constructing geopolitical entities so as to provide a guide to discursive geopolitics. The study employs cognitive pragmatic approach for that purpose. It investigates COVID-19 outbreak in by applying Cap's [4] model. The data consists of news about COVID-19 from NYT American newspaper. Cap's PT conceptualizes COVID-19 geopolitical identification by relating it to time and space.

Khalil and Al-Zubaidi [10] have investigated the linguistic constructions of carcinogen in English and Arabic scientific discourses. Their study employs qualitative and quantitative methodological procedures. Cap's [4] theory has been adopted. Calculations for both languages have been done by corpus linguistic through Anthony's (2019) AntConc. The study arrived to results that revolves around similarities and differences in constructing carcinogen threat in English and Arabic.

Another study by Khalil and Al-Zubaidi [11] has explored the spatial linguistic representation of carcinogens risk. The study aims at exploring constructions of carcinogenic spatial threat in scientific discourse. Cap's [4] theory of proximization; of crisis and treat construction, has been employed. The results revealed that there are various linguistic tools in scientific discourse that construct special proximization of the carcinogens risk. These tools are

employed indifferent rates so as to achieve particular cognitive pragmatic goals.

### 2.1. Temporal proximization

The temporal proximization (TP) is a strategy of the symbolic representations of time arises that result from two conceptual shifts: past–to-present and future-to-present. Fig. 2 below illustrates the process:

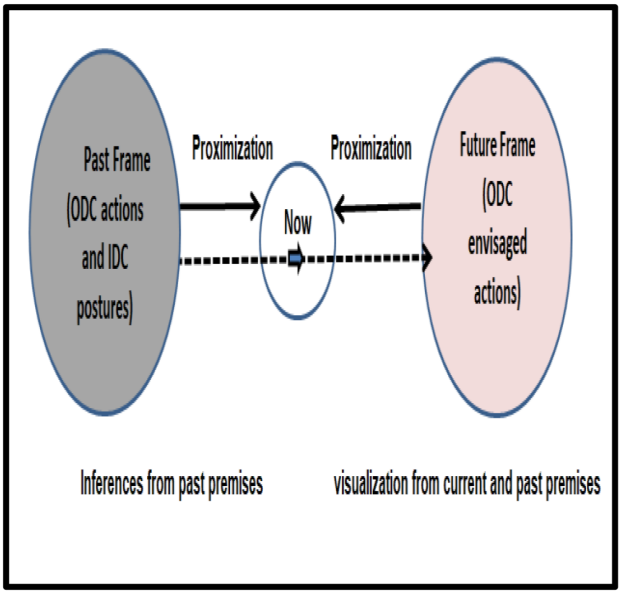


**Fig. 2.** Centralizing *now* for momentousness: Temporal proximization shifts [4].

To connect future events with actual past events, TP employs linguistic choices so as to combine the future envisaged events with actual past events. The structured combination of real times (RTs) lexico-grammatical markers and construed time (CT) lexico-grammatical markers is the candidates for the TP strategy. An RT marker represents an event that occurs at 'dated points in time, . . .while the CT markers "fit" these points into preferred temporal frames' ([4], p. 111). An RT marker is not restricted to a real past event. It presupposes a future event. A CT marker turns the future event into a durative perspective; the future events is construed to refer to a time between *now* and the *future*. For example, when one says *A September morning*, *A* is a CT marker. It describes *September morning* meaning (RT marker) to construe "unrealized future possibility" and "a past possibility remaining unrealized in most of the past frame" ([4], p. 112). A CT marker can be "indefinite descriptions, nominalizations, modal auxiliaries, and certain tense and aspectual patterns" ([4], p. 112). Category 1 in TP strategy makes construal by the following lexico-grammatical choices:

> *"(1) Noun phrases (NPs) involving indefinite descriptions construing ODC actual impact acts in alternative temporal frames"*
>
> *([4], p. 112)*

In category 1, the indefiniteness markers (*a* and *an*) are important for construing an RT actual event that could have happened before; or those that my re-occur at a time in the future [4]. Indefiniteness postulates a rhetorical sense that leads to rapid conceptualizations of the *now* frame that takes action against threat. The same is true with category 2 which has a pattern of grammatical tenses:

> *"(2) Discourse forms involving contrastive use of the simple past and the present perfect construing threatening future extending infinitely from a past instant"*
>
> *([4], p. 112)*

Category 2 produces synthetic descriptions; i.e. past moments presuppose ODC intrusive acts by using simple past and simple present perfect. Within TP strategy, the other categories consist of items that emphasize "the significance of the current moment without directly referencing a specific past ODC action using words" ([4], p. 113). There exist, however, alternative expressions that construe future virtual realities which occur in the past ODC acts. These alternatives incorporate an amount of lexical, grammatical and discourse components which determine elaborate inferences [4]. Category 3 leads to such inferences by nominalizations ([4], p. 113):

> *"(3) Noun phrases (NPs) involving nominalizations construing presupposition of conditions for ODC impact to arise anytime in the future"*

Category 4 consists of lexico-grammatical constructs and states as follows ([4], p. 114):

> *"(4) Verb phrases (VPs) involving modal auxiliaries construing conditions for ODC impact as existing continually between the now and the infinite future"*

Category 4 is related *can* and *could* modal auxiliaries. The present coded by such time adverbials as *today*, *now* or *at this moment*. In category 4, the organization is similar to that of category 3; it is durative in nature. Nevertheless, the threat period, in category 3, is bounded to the starting point [4]. Explicitness in the starting point makes the entity cross the boundary to enter the period of threat when threat is declared [4].

Finally, Category, 5, states as follows:

*"(5) Discourse forms involving parallel contrastive construals of oppositional and privileged futures extending from the now"*

*([4], p. 114)*

According to TP strategy, future postulates ODC threat to the IDC domain. Thus, addressers prefer IDC active status to passive status (oppositional future) in which threat cannot be recognized. It is a kind of oppositional future that can be expressed by category 5 has the longest linguistic forms. It requires contextual elaborations since emphasizing contrast requires quasi-dialogues and a significant text [4].

Briefly put, Table 1 presents the lexicogrammatical choices for the TP strategy categories:

**Table 1.** The Lexico-Grammatical choices of the TP strategy.

| Category | Lexico-grammatical resources within the discourse space |
|---|---|
| 1 | Noun phrases (NPs) involving indefinite descriptions construing ODC actual impact acts in alternative temporal frames. |
| 2 | Discourse forms involving contrastive use of the simple past and the present perfect construing threatening future extending infinitely from a past instant. |
| 3 | Noun phrases phrases (NPs) involving nominalizations construing presupposition of conditions for ODC impact to arise anytime in the future. |
| 4 | Verb phrases (VPs) involving modal auxiliaries construing conditions for ODC impact as existing continually between the now and the infinite future. |
| 5 | Discourse forms involving parallel contrastive construals of oppositional and privileged futures extending from the now. |

## 3. Methodology

To achieve its aim and answer the research question, the present paper adopts a mixed research methodology which combines both qualitative and quantitative procedures. Cap's [4] TP strategy (a component of proximization theory) have been used for the qualitative and quantitative analyses. In correspondence with proximization theory framework (Fig. 1), fossil fuel residues are considered as ODCs that are harmful and represent threat to the human bodies that are considered as IDCs. The threatening ODCs proximise (approach), within specific times (TP strategies) to the IDCs. This scenario provokes preventive measures to be taken by people to ameliorate the threatening situation. Fig. 3 clarifies the scenario in correspondence to Proximization Theory Framework:

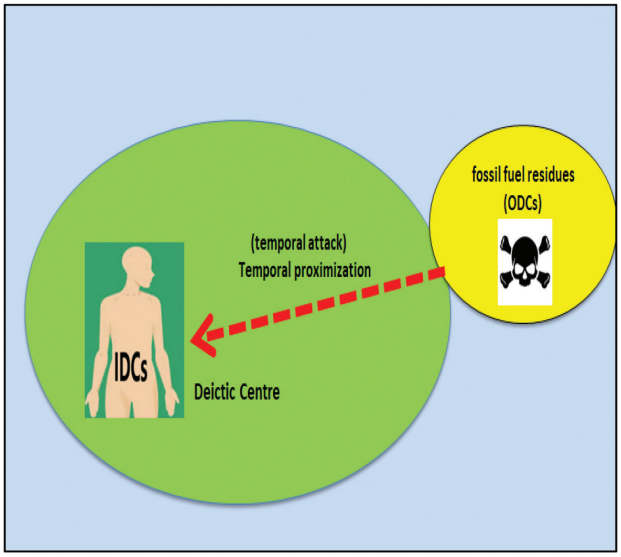


**Fig. 3.** Fossil fuel residues temporal threat (Adopted from [5]).

Calculations were done by corpus linguistics using Anthony's AntConc (2019) software. AntConc is free corpus linguistics software created by Laurence Anthony (a Director of the Centre for English Language Education, Waseda University in Japan). The software can be freely downloaded from http://www.laurenceanthony.net/software/antconc/. The version employed in the analysis is AntConc 3.5.8 (windows) (Anthony, 2019). It offers advanced actions and facilities for any corpus analysis in linguistics [16]. It also provides standard text analysis functions. It is also useri-friendly, lightweight program, basic and easy to use toolkit [7]. AntConc reads and processes data converted to the formats of .txt, .htm, .html or .xml. *AntFileConverter* software has been downloaded from the same webpage above to covert the corpus files before processing them by AntConc. The corpus was built by the researchers. It has been constructed by extracting the texts of WHO reports from online sources. The texts have then been saved as individual pdf files; each file is a report by itself. Using AntFileConverter, the pdf files were converted to plain texts of txt format.

The size of the corpus is estimated either by the number of documents or the number of tokens (words). The terms token and type are essential in corpus linguistics. Token "refers to the number of words in the corpus and type to the number of different words" ([16], p. 59). For example, the indefinite article *an* occurs 1,200 times in a corpus (token) but counts as one type only. The corpus which is created for a specific purpose my contain about 20 high quality documents so as to be representative [13]. This is the common method for measuring

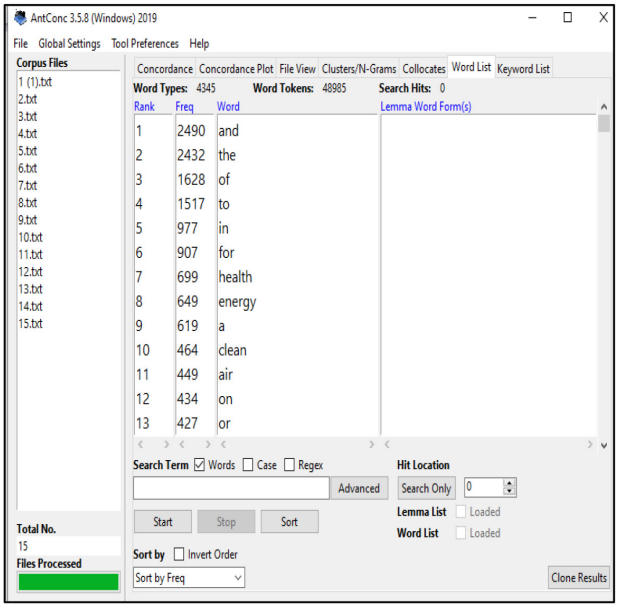


**Fig. 4.** The corpus size.

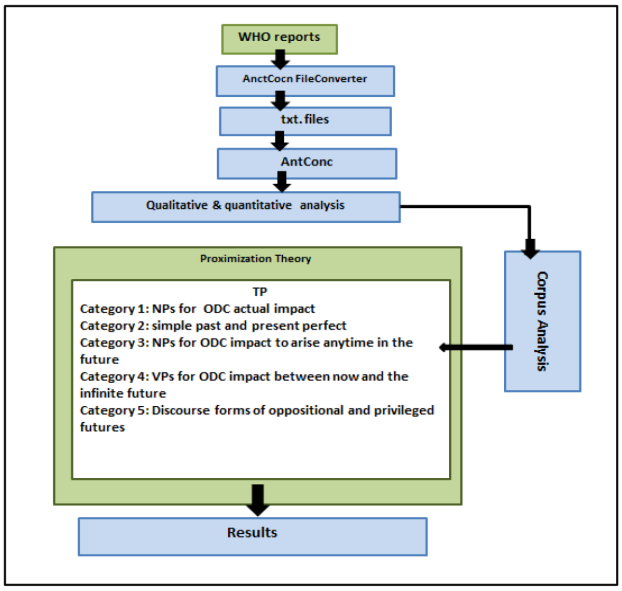


**Fig. 5.** The methodological framework of analysis.

corpus size. However, there is no fixed number of tokens because it depends on the aims and the targeted linguistic features ([2], p. 18). Thus, corpus linguists need to think "about the nature of the evidence that the corpora provide in terms of their quality (representativeness and balance) as well as their quantity (corpus size)" ([2], p. 19). Therefore, to be representative, a corpus could have thousands, millions or billions words ([2], p. 38).

In the present paper, although obtaining statistical results is vital for achieving objective results, the robust aim is to find out the way and the extent to which WHO reports employ language choices to construct fossil fuel threat from temporal perspectives. Moreover, The corpus has been compiled by the researchers; the corpus has not been taken from a corpus bank or a web source where million or billion word corpora can be found. In addition, the paper targets a specific discourse (WHO reports on the adverse effects of fossil fuel). Hence, the number of token method is considered the standard for the corpus size. Accordingly, the corpus constructed can be considered representative. The corpus of the WHO reports here consists of 48985 tokens; as is shown in Fig. 4.

The combined qualitative and quantitative methodological framework of the present paper is presented in Fig. 5.

## 4. Analysis and discussion of results

### 4.1. Analysis

The lexico-grammatical choices of TP strategy are set into five categories. In category11, indefinite markers (NPs pre-modified by indefinite articles) construe "real time actual events" that may have happened before or at any moment later in the future. The NPs have to refer to time (e.g. *day, week, month, time,* etc.). The corpus analysis has been done by the Word Lists, Concordances and the FilesView tools. The File View tool provides access to the file which includes a particular noun whose context is unclear in the concordance. The results are put in Table 2.

**Table 2.** The NPs with indefinite description; Category 1.

| NPs with indefinite descriptions | Frequency |
|---|---|
| The report this year comes at **a crucial time**… | 1 |
| • The use of traditional biomass also means households spend up to 40 hours **a week** gathering firewood…<br>• Walk or pedal to work at least one day **a week**. | 2 |
| • Household air pollution kills 4 million people **a year** and tends to…<br>• Determine the frequency of data collection (e.g., monthly, twice **a year**, annually).<br>• Today costs around $40 billion **a year**, …<br>• high-level decision-making committee that meets two to four times **a year**…<br>• Meeting the goals of the could save about a million lives **a year**. | 5 |
| Total | 7 |

Category 2 employs the present perfect simple and simple past tenses to construe threatening effects of ODCs that started at some point in the past and has extended to the future. The lexico-grammatical choices are iVPs of the simple past and the present perfect simple. The corpus analysis has been conducted by separately investigating the following search terms

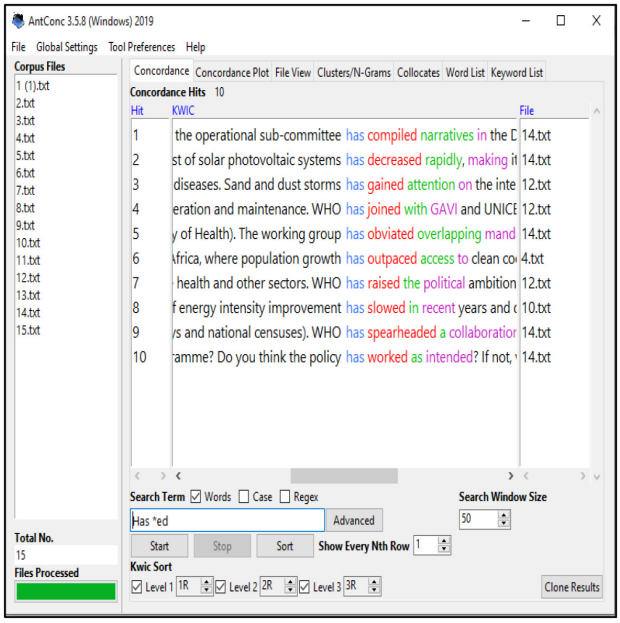


**Fig. 6.** Investigating the present perfect (with *has*) tense.

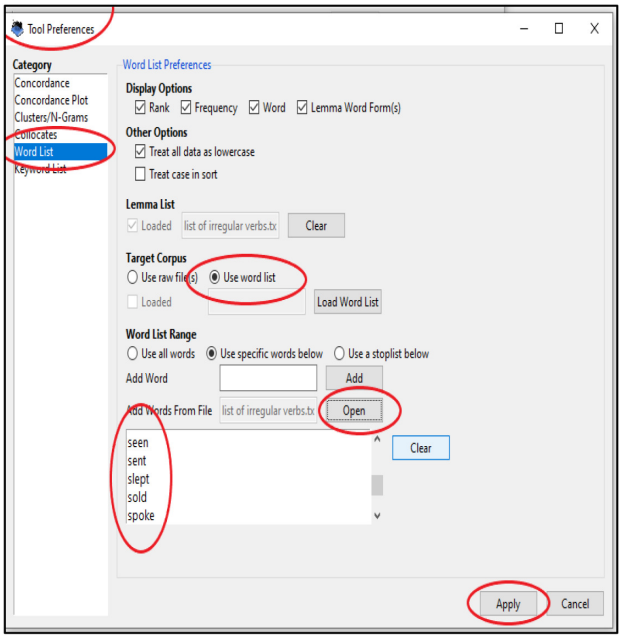


**Fig. 7.** Generating a specific word list for irregular verbs.

which indicate the pasts (a) and present perfects (both b and c):

a. **ed*
b. *Have *ed*
c. *Has *ed*

The wildcard * helps investigating different forms of the verb (pasts, past participle); as is shown in Fig. 6 for the present perfect (with *has* as auxiliary).

The search terms a, b and c have been investigated separately. The wildcard * indicates an unspecified main verb. The concordance of each tense structures has been generated and investigated separately. The concordance lists have been manually checked to terminate irrelevant constructions and adjust the number in AntConc box for the concordance. The Files View tools has also been sometimes used.

The concordance list has been filtered again manually to obtain the final frequency of the past tense. The same process has been performed with *have *ed* and *has *ed* to investigate the present perfect. As for the irregular verbs, the analysis has been done by adjusting advanced settings of AntConc where an option to investigate a specific word list exists. Two lists of the irregular verb forms (past and past participle) have been generated and converted to the txt. file format. Then, the lists have been processed by the specific word list tool in AntConc. This tool can be accessed by the following steps which are designated in Fig. 7:

1. Downloading the target corpus to AntConc in a txt. file format;
2. Generating a word list;
3. Hitting the *Choice Preferences* button at the top of the front page of AntConc;
4. Hitting the *WordList* choice on the left;
5. Selecting the *Use specific word list below* choice;
6. Hitting the *open* button to select the txt. File (stored in PC) of the list of specific words so that the list will appear below;
7. Hitting the *apply* button;
8. Hitting the *start* button in the front page of AntConc.

The result of the procedure above is the word list of the irregular verbs shown in Fig. 8.

Then, the concordance of each irregular verb has been manually checked to estimate accurate statistical results. With both regular and irregular verbs and with past and present perfect, the Concordance tool has been relied on not only to check the grammar of the sentence but also to check the meaning of each verb whether or not it fits the notion that the verb indicates a future threat that has extended from the past. The File View tools has been sometimes employed. The statistical results of category 3 are shown in Table 3.

Examples cases are as follows:

1. A good practice statement on desert dust and sand and dust storms *was incorporated* for the first time in the latest WHO AQG.2
2. Household air pollution *accounted for* the loss of an estimated 86 million healthy life years in 2019. . ..

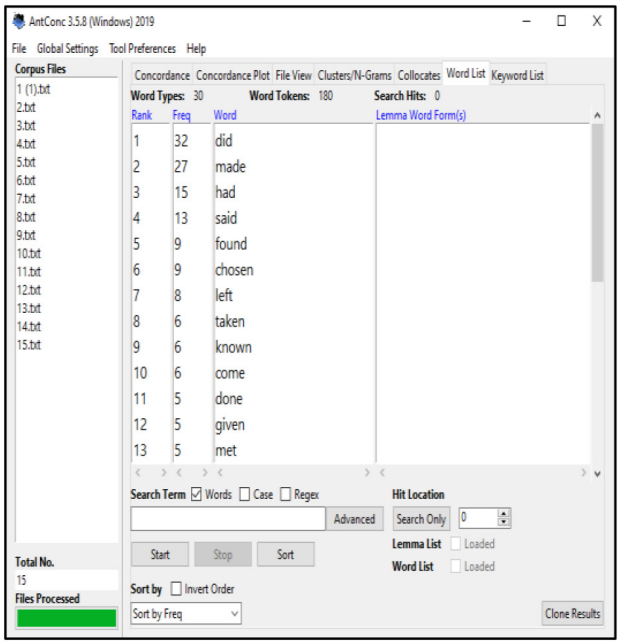


**Fig. 8.** The list of irregular verbs in the corpus.

**Table 3.** The statistical result of Category 2.

| Tenses | Frequency |
|---|---|
| Past | 22 |
| Present perfect | 1 |
| Total instances | 23 |

3. WHO *has* recently *released* new data on the use of different types of fuels used for cooking at global, regional and country levels.
4. The ongoing pandemic also *had* negative impacts on the access to clean cooking solutions.
5. Less than 50% of World Heart Federation survey respondents *felt* that they do not have access to any information on air pollution and cardiovascular health.

In these example, the present perfect simple and the simple past construe fossil fuel threat that extends from a past point of time to the future.

Category 3 employs NPs that nominalize construal ODC impact to arise anytime in the future. The identification of these NPs depends, first, on *semantic microstructure* aspects (local meanings/ local semantics) which are derived from "the meaning of words . . ., the structures of propositions, and coherence and other relations between propositions" ([17], p. 103). They "are the result of the selection made by speakers or writers in their mental models of events or their more general, socially shared beliefs" ([17], p. 103). Cap ([4], p. 91) himself has emphasized the importance of semantic microstructure to assign the lexico-grammatical choices of this category when he emphasized that the "explicit lexical coding of the presupposition ("before") helps construe the negative scenario in terms of its development". Second, the identification also depends on *semantic macrostructures* (global semantics) which, by themselves, depend on semantic microstructure. The semantic macrostructure is the global sense of a discourse. It explains the global coherence in a text or talk and "define[s] what speakers, organizations and groups orient towards and that has most impact on further discourse and action" ([17], p. 102). These topics are inferred from discourse by the interlocutors, but "they are often expressed in discourse, for instance in titles, headlines, summaries, abstracts, thematic sentences or conclusions" by which interlocutors conclude global topics ([17], p. 102).

**Table 4.** The statistical result of Category 3.

| NPs | Frequency |
|---|---|
| Pollution | 82 |
| Climate + change/impact | 52 |
| Death(s) | 29 |
| (Lung) cancer | 15 |
| Disease | 12 |
| Risk | 10 |
| Stroke | 10 |
| Asthma | 4 |
| Total instances | 214 |

The corpus analysis has been done on three steps. The first is to survey the corpus word list to find NPs that name the impact of fossil fuels and their residues. The second step is to manually check the concordance of each possibly related NP to make sure that its meaning matches the pragmatic meaning assigned in the category and to search for the occurrence of *before*, or any semantic equivalent, in the same structure. There is semantic equivalent which can be identified by the idea that there is a possible condition for ODC impacts to occur at any time in the future rather than an actual case that has already occurred. These two steps are the procedures followed to employ semantic microstructure. The third step has been done through the File View tool to check the co-text and semantic macrostructure in a wider context where the NPs exist. The results of analysis are shown in Table 4.

Examples are:

6. WHO *is currently working to better assess and monitor air pollution* as a **risk** factor. . ..
7. The module provides health professionals with the choices to integrate household energy and household *air pollution as a risk factor* for **disease** and the knowledge to 'prescribe' clean household energy solutions

**Table 5.** The statistical result of Category 4.

| Modal auxiliary | Frequency | Now time adverbial | Frequency of the category members |
|---|---|---|---|
| Can | 138 | Ø | Ø |
| Could | 36 | Ø | Ø |
| Total instances | | | 0 |

8. Far too many people . . . *still lacks accessi to cleani cooking fuels and technologies, exposing them to dangerous levels* of household **air pollution**.

In (6), for example, *risk* refers to the impact of the fossil fuel pollutants which are represented by certain chemical compounds. Their impact is negative. There is no explicit *before* lexical item in the sentence. Rather, the sense of *before* exists in the notion that *people can change cooking fuel to reduce threat* ***before*** *threat elements afflict them*. Such meaning does not extend from one specified point in time. Rather, the state emerges from potentially infinite points in the future. Consequently, a pre-emptive action is assigned as a prevention procedure within the *now* framework because nobody knows the specific time in the future when the ODC impact capacity is reached.

Category 4 is a straightforward one in that it utilizes specific lexico-grammatical choices; the modal auxiliaries *can* and *could* when their sentences are put within the *now* temporal domain. To investigate this category through AntConc, a special word list has been created in AntConc for *can* and *could*. Then, the concordances of *can* and *could* have been manually investigated to identify the occurrence of time adverbial that denotes *now* reference. The File View tool has been frequently consulted in the majority of the instances. The results are shown in Table 5.

In category 5, the direction of the future attack is supposed to be the reverse of the usual current one. It is a kind of future precaution procedure which extends from *now* to the future. Thus, the IDCs are supposed to launch a defensive attack against the ODCs and a prevention action takes place. The corpus analysis has been performed on two phases. The first investigates the concordances (and the File View guides in many instances) of the IDCs (such as, *children, woman/ women, lung(s), nations, human, body, people,* etc. that appeared in the word list) to see whether or not they perform a presupposed future prevention action. This process has been done first by downloading the corpus to AntConc. Then, the head of each NP that indicates an IDC is hit to display its concordance. In the second phase, the corpus word list is investigated to find another word that suggests a prevention action to be performed by the IDCs against fossil fuel threat. For example, the verb *avoid* in the word list has been hit to exhibit its concordance. In addition to *avoid*, the other words whose concordances have been checked

**Table 6.** The distribution of the TP strategy Categories.

| No. of category | Lexico-grammatical choices within the discourse space | Total instances | Percentage of instances |
|---|---|---|---|
| 1 | NPS for ODC actual impact | 7 | 1.11% |
| 2 | Simple past and present perfect | 23 | 3.65% |
| 3 | NPs for ODC impact to arise anytime in the future | 214 | 33.91% |
| 4 | VPs for ODC impact between now and the infinite future | 0 | 0.00% |
| 5 | Discourse forms of oppositional and privileged futures | 387 | 61.33% |
| Total instances | | 631 | 100% |

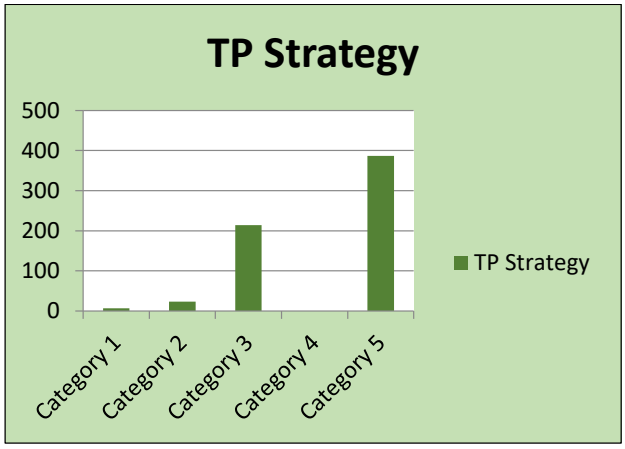


**Fig. 9.** Distribution of TP strategy categories.

are *found, prevention, could, possible, reduce, control, low, might, need* and *lower*. Although the corpus analysis of category 1 was time and effort consuming, it came up with optimistic results on the future level. There are 387 discourse forms in the corpus that indicated oppositional and privileged futures where fossil fuels adverse effects are supposed to be reduced to the minimum levels. Examples from the corpus are:

9. *"The aim of the campaign is to mobilize communities to reduce the impact of air pollution on health and the climate. It includes brochures, graphics and videos that can be used to educate people about the threat that air pollution poses to health."*
10. *"Nonetheless, additional efforts and measures must urgently be put in place to ensure that the poorest and hardest-to-reach people are not left behind."*
11. *"The challenge for policy-makers and other stakeholders is to improve access to cleaner alternatives for as many people as possible as rapidly as possible."*

The final statistical results of TP strategy categories are summed up in Table 6.

Fig. 9 provides graphic presentation for the TP strategy categories distribution in the corpus.

**Table 7.** The ranks of the TP strategy Categories.

| Category rank | Category no. | Lexico-grammatical choices | Total instances | Percentage of instances |
|---|---|---|---|---|
| 1st | 5 | Discourse forms of oppositional and privileged futures | 387 | 61.33% |
| 2nd | 3 | NPs for ODC impact to arise anytime in the future | 214 | 33.91% |
| 3rd | 2 | Simple past and present perfect | 23 | 3.65% |
| 4th | 1 | NPs for ODC actual impact | 7 | 1.11% |
| 5th | 4 | VPs for ODC impact between now and the infinite future | 0 | 0.00% |

### 4.2. Discussion of results

The TP strategy categories can be organized into five ranks depending on their rates of occurrence in the corpus as shown in Table 7.

In the first rank comes category 5 (387 instances; 61.33%). According to this category, the IDCs are granted more potential so as to reverse the circumstances between the DS periphery and center. IDCs can have active roles through reversing the circumstances and launch reversed attack against the threatening entities. The legitimization preventive actions is the goal threat construal. This goal grants the strategies balance between threat construal and directing the IDCs to face that threat. Although the lexico-grammatical choices of category 5 can be sentences, they are abundant in the corpus to reveal WHO's tendency and efforts of ameliorating the conditions of people's health against fossil fuel adverse effects.

Category 3 (Table 4) is put in the second rank. The operations of the NPs in category 3 of the TP strategy indicate a pragmatic function where there is more reliance on inference rather than on reference. Instead of promoting the interlocutors' knowledge of certain ODCs (fossil fuels and fossil fuel residues and their adverse effects), category 3 NPs imply that interlocutors should expect threat at any time; from *now* to the *future*. Thus, *before* is the main presupposition indicator. Therefore, part of TP relies on the way construed temporal items change real time events to ODC impact conditions to appear in the future.

Category 2 (Table 3) has obtained the third rank. The lexico-grammatical choices, simple past and present perfect simple, explicitly refer to actual fossil fuel impacts. Actual cases are common because the high rates of fossil fuel adverse effects around the world. To some extent (23 cases) the corpus uses category 3 as means and example real cases that motivate legitimization of performing rapid preventive actions so as to face the threat of periphery forces.

According to Table 2, category 1, in which NPs (with temporal denotation) are pre–modified by indefinite articles, is in the fourth rank. The infrequent occurrence has resulted from the highly specific nature where time-related meanings are associated with indefiniteness. The indefinite articles are indications of a continuous construed time that spans from *now* to the indefinite *future*. The heads of these NPs are markers of real-time. They pave the way for indefinite possible *future* scenarios. Low frequency has resulted from the unspecific nature of the global threat that stems from fossil fuels; there is no specific time for that threat to occur. Moreover, individuals show various exposure durations to fossil fuel residues before being afflicted with related diseases. Therefore, TP strategy is mostly achieved by different categories rather than time-specific terms that restrict the temporal occurrence of threat.

This fact can also explains the 0 frequency of category 4 (Table 5); where modal auxiliaries, *can* or *could*, co-exists with time adverbials with time span reference that occurs within the scope of *now*. The lexico-grammatical choices here limit the duration of threat to its starting point. The text Producers of WHO reports are supposed to have already stated fossil fuel residues threat period at the moment threat is declared. Yet, this is not the communicative intention of WHO reports; the communicative intention is to warn of a potential threat that may arise at any moment and suggest preventive measures to face that treat.

## 5. Conclusion

The TP strategy categories have shown diversity in density and employment. Category 5 (discourse structures of oppositional futures) has the higher frequency. It construes the normal status as being reversed where IDCs (human bodies and any related component that has anything to do with human, health, the surrounding environment, and any other element that is in contact to human health and prosperity) attack the threatening ODCs (fossil fuel residues and adverse effects). This optimistic way of construing TP is more encouraging and is more proactive. It promotes hope and encourages actions to be taken *now* on the bases of preventing *future* adverse effects of fossil fuels.

After focusing on portraying bright future, WHO reports next turn to presuppose the existence of a possible present condition for ODC negative impact to exist (at any time) in the future (category 3). The reports anticipate future threat according to present

or past threatening events. Thus, the statistics reveal a gradually moving scenario which shifts from the optimistic states (category 5) to pessimistic states which anticipate fossil fuel impact to appear anytime in the future. Showing optimistic and pessimistic states in close rates grants WHO reports a better proximization process and promotes stronger preventive measures.

WHO reports do not show reliance on simple past and the present perfect (category 2) to infer threatening future instances which extends from past instants. Thereby, past events are part of the past and past experience does not have a considerable significance in raising fair from the threatening elements. The same is true with the actual impact (of the threatening elements) which is construed by NPs (category 1). Such actual impacts represent pieces of evidence for the threatening nature of fossil fuels. However, WHO reports (intentionally or unintentionally) neglect evidence in raising fear and legitimizing preventive measures. Neglect also extends to the ever existing impact (category 4) which can be represented by VPs with modal auxiliaries that construe conditions for ODC impact that continually exists between *now* and the *infinite future*.

The results and conclusions of this paper are of significance for WHO reports producers who are capable of enhancing WHO discourse comprehension through taking into consideration such detailed and deep analysis. Results from corpus linguistics call attention to the role of particular linguistic choices in shaping comprehension and knowledge. Experts, professionals of English and researchers are encouraged to further investigate other issues in WHO reports.

Based on the findings in the present paper, further research can be conducted to investigate the construal of many different critical issues and threatening elements in WHO reports; for example global warming, pandemics, drought, or famine, using [4] proximization theory.

## Conflict of interest

The authors declare no conflict of interest.

## Authors' contribution

The authors Nawal M. Abed and Huda H. Khalil contributed equally to this work.

## Data availability

The datasets generated and analyzed during the current study are available in the websites listed in the "References of the Corpus" section in the present paper.

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