Constructing Carcinogen Risk in Scientific Discourse Through Ideological Conflict: A Cognitive Pragmatic Analysis

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Abstract—With the increasing rates of cancer worldwide, a great deal of scientific discourse is devoted to arguments and statements about cancer and its causes. Scientists from different fields try to seize any available chance to warn people of the risk of consuming and exposing to carcinogens that have, unfortunately, become essential parts of modern life. The present paper attempts to investigate the proximization strategy through which scientists construct carcinogen risk to enhance people's preventive actions against these carcinogens. The paper targets the construction which depends on producing the conflict between the values of the people themselves and the contrasting values assigned to carcinogens. To achieve this aim, Cap's (2013) cognitive pragmatic theory of proximization is employed for analysis. The theory is a component of three proximization strategies: spatial, temporal and axiological. Of these three proximization strategies, axiological proximization strategy is applied to a corpus from scientific discourse. To arrive at more objective results, the analysis procedure is both qualitative and quantitative. Mathematical calculations are performed through corpus linguistics using Anthony's AntConc (2019) corpus linguistics software. Eventually, the paper has arrive at certain conclusions that reveal the way actors (producers of scientific discourse) utilize axiological proximization strategy to portray carcinogen risk as a means for promoting people to take preventive measures.

Index Terms—axiological proximization, carcinogen, cognitive pragmatics, proximization theory, scientific discourse

I. INTRODUCTION

Cancer represents a universal and public health issue. It is the main cause of the majority of death cases around the world. About 9.6 million death cases have been recorded in 2018. According to Arafa et al. (2020), it is expected that, "by 2030, there would be a 1.8 fold increase in cancer incidence" (p. 638). A great deal of cancer cases are caused by carcinogens which are everywhere in the environment. The term carcinogen (noun) was formed in 1853 from the Latin word *carcinoma* (from Greek *karkinoma*) which means "malignant tumor, cancer" and the suffix *-gen* which means "something produced," or "thing that produces or causes" (Carcinogen, 2008). Carcinogens can promptly penetrate human bodies through food, air, radiation, water, make up products, smoking, etc. Thus, for Pohanish (2002), a carcinogen is a material or a mixture of various materials "causing the promotion or initiation of malignant or benign neoplasia (cancer) in humans or animals" (p. 12).

Cancer and carcinogen issues are mainly the interest of scientific discourse which is the kind of discourse that constructs knowledge linguistically. The kind of knowledge in scientific discourse stems from fields like medicine, chemistry, physics, biology, pharmacy, ecology, etc. Knowledge about these disciplines is textualized through linguistic resources. To identify knowledge structure, one needs to examine language that expresses knowledge (Hao, 2020). Scientific discourse is different from other kinds of discourse. Wei and Yu (2019) believe that scientific discourse displays very formal language that depends on its "ideographic function, textual function and interpersonal function" (p. 948). Wei and Yu (2019) list a number of genres that are related to scientific discourse such as "scientific writings, scientific papers, experimental reports, scientific and technological information materials, introduction of scientific and technological trends and operating procedures of experiments, etc" (p. 948). Scientific discourse is simply the contextualized text used by scientists or those engaged in science. It has certain grammar, pronunciation and spelling forms that are close to those found in almost all kinds of discourse. It has general vocabulary with a considerable number of specialized or familiar terminologies that are utilized in specialized ways (Yore et al., 2004).

Scientific discourse is a discourse of conflict where scientists argue over whether plausible explanation may be extracted from the collected data (Harris, 1997, cited in Hanauer, 2006). Within scientific settings, research is legislated in the framework of discourse which converts raw data to scientific arguments and theoretical positions that are evidentially supported (Prelli, 1989, cited in Hanauer, 2006). It is obvious that conflict and argumentative tendency are

salient features of scientific discourse. In scientific discourse on carcinogens, these two features may operate together to create an amalgamation of ideological conflict between the values of people who are susceptible to cancer and the opposed values of carcinogens which bring harm to people. Such ideological conflict is established in discourse to enhance awareness of the risk of consuming or exposure to carcinogens. Enhancing awareness is linguistically achieved through proximizing the ideological conflict to people in order to construct risk and crisis. Proximization in general and axiological proximization in particular operate in a way that attempts to convince people to take preventive actions against the substances that people have long thought to be environmental friendly and essential parts of life.

The present paper aims at finding out the way the ideological conflict is achieved in English scientific discourse on carcinogen risk. Considerable scientific discourse resources have tackled the issue of carcinogen risk. Hence, the paper is after finding out the means that scientific discourse relies on to construct carcinogen risk through arguing the ideological conflict of values between people themselves and the carcinogens which have become inseparable part of human life.

To achieve this aim, Cap's (2013) theory of proximization is employed. It is a theory within cognitive pragmatics that adopts three proximization strategies for threat and crisis construction: spatial, temporal and axiological proximization strategies. Axiological proximization strategy, in particular, has been employed for the analysis of the data since it represents the linguistic tool to construct the gathering ideological conflict to achieve threat and crisis construction.

For better solid results, the paper adopted a mixture research procedure of qualitative and quantitative analysis. Cap's (2013) axiological proximization strategy (as part of proximization theory) is employed for both qualitative and quantitative analysis. In the quantitative part, mathematical calculations are performed through corpus linguistics. Anthony's AntConc (2019) software is employed for the corpus analysis. AntConc can be freely downloaded from the web page http://www.laurenceanthony.net/software/antconc/.

The corpus is user created rather than readymade web corpora. The sub-genres for the corpus include scientific reports presented by scientific associations or institutes (governmental and non- governmental), news reports on scientific facts, scientific articles presented in online periodicals and those presented by medical and ecological webpages. The texts have been extracted from electronic sources. The internet provides a robust source for texts related to different genres and different kinds of discourse. Thus, people are now able to achieve both better understanding and more information from the internet which provides important assistant for people (Wu & Qian, 2011). Then, the texts have been converted to Word. doc files; a file for each text (article). Ultimately, the software AntFileConverter has been used to convert the Word. doc files to txt. format to be processed by AntConc. AntFileConverter can be downloaded for free from http://www.laurenceanthony.net/software/antconc/.The corpus consists of 56410 tokens.

II. Cognitive Pragmatics and Proximization

If pragmatics is concerned with the study of meaning-in-context (Levinson, 1983), Gallai (2019) thinks that cognitive pragmatics can be viewed as comprising "the study of the cognitive principles and processes involved in the construal of meaning-in-context" (p. 51). Cognitive pragmatists focus on the inferential chains which are crucial to understand the interlocutor's intention in communication. The starting point is the utterance together with the mental representations behind the comprehension of different cognitive phenomena as cognitive processes (Gallai, 2019).

The main concern of cognitive pragmatics is the mutual relation between pragmatics and cognition. Since pragmatics is concerned with contextual meaning, Schmid (2012) states that cognitive pragmatics "focuses on the cognitive aspects of the construal of meaning-in-context" (p. 3). Though this is true for both production and comprehension of language, Bara (2010) believes that it mainly attempts to provide an answer to the question which pragmatics also attempts to answer: What are the required cognitive processes and abilities which enable humans to find out "what can or must be said" to arrive at "what is meant" and arriving at "what is meant" depends on "what is said"? (p. 1). Thus, cognitive pragmatics is "the study of the mental states of people who are engaged in communication" (p. 1). Schmid's (2012) conception of cognitive pragmatics is more specific than Bara's (2010) because the former emphasizes the construal of meaning rather than communication. In addition, Schmid's (2012) conception is more general because, rather than focusing on mental states, it focuses on cognitive aspects in general.

For pragmatists, cognitive pragmatics is not a hybrid discipline of cognitive linguistics and pragmatics. Rather, pragmatics is viewed to be cognitive all along. This fact is apparent in some of the classics in pragmatics literature such as Grice's (1975) implicatures and the way they are formulated and Searle's (1975) ten steps that lead partners (text receivers) to the interpretation of indirect speech acts. Sperber and Wilson's (1985) book *Relevance: Communication and Cognition* and the cognitive and communicative principles proposed within the Relevance Theory provide a further piece of evidence to support this fact. It is obvious that classical pragmatic theories have produced a number of approaches that fall within cognitive linguistic frameworks. These approaches can be categorized as cognitive pragmatic ones, although the term *cognitive pragmatics* has not so far been applied to them (Gallai, 2019).

Cognitive linguistics has offered evidence-based tools for many of its main claims by adopting data from experimental psychology and neuroscience. Unlike pragmatics, cognitive linguistics does not have a systematic theory to account for indirect meaning. For Cap (2013), pragmatics has important theoretical contributions within the notions

of "communicative intention, effect, utterance and discourse context, implicature and inference" (p. 8). Recently, it has adopted quantitative and experimental methods to account for social and sociopolitical aspects of discourse (Cap, 2013).

Methodologies of cognitive linguistics provide the conceptual structure for the study of Discourse Space (DS) related theories (Chilton, 2014). Such DS theories include Werth's (1999) Text World Theory (TWT), Levinson's (2003) theory of spatio-temporal frames of reference, Chilton's (2004) Deictic Space Theory (DST) and Cap's (2013) proximization theory. Cap's (2013) theory depends on Paul Chilton's cognitive-linguistic contributions which theorize DS and present a model of spatial, temporal and modal conceptualizations together with applications to political discourse. For DS theories, Chilton (2014) assures that positioning is like a backbone for the performance of these theories within texts in general. Positioning is "the conceptual process whereby some entity is cognised as located at some position relative to some reference point" (p. 52). Defining positioning, Hart (2018) states:

> Positioning is a broad strategy which concerns where we situate ourselves within the conceptualisation and where other actors and actions are located relative to this position. It thus incorporates distancing and proximisation strategies and can be spatial, temporal, social, epistemic and axiological (pp. 82- 83).

Positioning is related to the grammatical constructions which are affected by the arrangement of the mental spaces as regions of conceptual space. It is also related to stretches of text that are affected by the construction of the discourse world inside the DS. Positioning strategies depend on the cognitive ability of forming points of view. These strategies are conceptually realized in the deictic organization and the shift in the points of view (Hart, 2018).

In processing any kind of discourse, Chilton (2004) says that people position entities around them in the world by locating "these entities in relation to themselves along … three axes, space, time and modality" (pp. 57- 58). For Cap (2018), the spatial dimension is primary since conceptualizations within the remaining dimensions occur in spatial terms. The conceptualization of time occurs through motion in space, and the conceptualization of modality occurs in terms of distance. Thus, modality conceptualization is "a metaphoric extension of the binary opposition between the close of the remote" (p. 93). The three dimensions are originally related to the deictic center that includes the symbolic *Self* (I, we, etc.). The other processes and entities occur in relation to "ontological spaces defined by their coordinates on the space (s), time (t) and modality (m) axes" (p. 93). This way, the conceptualization of the ontological configurations (activated by a text) becomes possible.

III. THE CONCEPT OF PROXIMIZATION

Proximization is a new notion in linguistics. The verbal forms "proximise" and "proximising" are first found in Chilton (2004). The nominal form "proximization" was proposed by Cap (2005) who used it to refer to "an organized, strategic deployment of cognitive-pragmatic construals of/ in (originally, political) discourse" (cited in Cap, 2013, p. 5). Since then, "proximization has developed into a cognitive-linguistic, pragmatic, as well as a critical discourse analytic concept which accounts for the symbolic construal of relations between entities within the Discourse Space (DS)" (Chilton, 2005, cited in Cap, 2013, p. 5). It deals with the symbolic shift in which the peripheral elements in the DS are construed as central elements within the deictic center of the Space.

Many thematic domains and theoretical frameworks have employed the explanatory power of proximization. Chilton's (2004) DST and Levinson's (2003) spatio-temporal frames of reference are essential reference models for many later works that attempted to redefine and revise the original framework of conceptual shifts towards the deictic center in linguistic (both lexical and grammatical) terms. Most of these later works use the concept of proximization to determine particular linguistic items that construe the shifts in imposing worldviews. With regard to proximization, Cap (2018) states:

> [P]roximization is a discursive strategy of presenting physically and temporally distant events and states of affairs (including 'distant' adversarial ideologies) as increasingly and negatively consequential to the speaker and her addressee. Projecting the distant entities as gradually encroaching upon the speaker-addressee territory (both physical and ideological), the speaker seeks legitimization of actions and/or policies she proposes to neutralize the growing impact of the negative, 'foreign', 'alien', 'antagonistic', entities (p. 97).

Cap (2020) considers proximization to be a discursive strategy of constructing crisis, conflict and threat. It relies on "the movement dynamics of entities positioned in Discourse Space" (p. 281). It is concerned with the physical and temporal presentation of distant events and states of affairs (including distant and adversarial ideologies) in relation to the actor (text producer) and his/ her partner position within the deictic center of the DS (Cap, 2020).

Cap (2006) has proposed the term *proximization* to analyze patterns of coercion in the US anti-terrorist rhetoric following 9/11. Since then, it has been used in various discourse domains. However, it has been most commonly employed in political discourse studies to investigate crisis construction and war rhetoric, anti-migration discourse, political party representation, construction of national memory, and designing foreign policy documents (Cap, 2020).

For Cap (2013), proximization is an end rather than a means and it is of a pragmatic nature in that it is concerned with certain discourse goals where it (proximization) is identified. Proximization is related to issues of representation that are addressed by Chilton (2004) within cognitive linguistics. A theory of proximization needs first to derive linguistic forms from cognitive categories (such as space or time) to propose directions in which these linguistic forms could be applied in DS. Therefore, there is a sense of interdisciplinarity which goes in two directions. First, there is interdisciplinarity between the pragmatic approach and the "upward" cognitive approach. Second, interdisciplinarity

exists between the pragmatic approach and the "downward" configurations of lexico-grammatical forms that perform proximization and the changes in these configurations that result from (extralinguistic, geopolitical, social,) context. Corpus approaches are needed to measure these changes in word counts (Cap, 2013).

IV. THE THEORY OF PROXIMIZATION

Proximization theory relies on the original concept of proximization which, as Cap (2020) states, acts as an operation of forced construal that evokes "closeness of the external threat in order to solicit legitimization of preventive measures" (p. 281). The spatio-temporal-axiological (STA) proximization model proposed by Cap (2013) encompasses the strategic deployment of particular lexico-grammatical choices that are derived from the cognitive categories of space, time and value. These cognitive categories suit the demands of a dynamic temporally-extensive context. Thus, the model depends on interdisciplinary research program that involves cognitive, pragmatic, critical and corpus-based approaches (Cap, 2013).

The most innovative part of proximization theory (the part which is missing from the works that try to reconcile cognitive vs. pragmatic perspectives) is the account of the lexico-grammatical data. The lexico-grammatical choices are vital because they lead to the linguistic establishment of the deictic center and the deictic periphery. Accordingly, they help maintain symbolic construals whereby the peripheral entities cross the distance in DS to penetrate the deictic center (Cap, 2013).

The lexico-grammatical patterns (together with the way they coincide with the extra-linguistic changing context in an extensive time interval) depend on a set of cross-disciplinary premises. It goes along with the cognitive concept of DS in terms of both its offline static pre-existence and its online dynamics of new meaning construction through conceptualization. It lines up with cognitive metaphoric schemas. Moreover, proximization theory sets linguistic representations for mappings and mental representations to pragmatically accomplish certain aims. The dynamic nature of the social and political context considers these aims as the frame of legitimization. The lexico- grammatical choices combine the cognitive, pragmatic and social theoretical inputs to maintain time spans. The proportions of choices that reflect the spatial, temporal and axiological categories are in continuous change. Therefore, these changes reveal the shifting status of space, time and value dimensions (Cap, 2013).

The threat advances from DS-peripheral entities which are considered to be outside-deictic-center entities (ODCs) (carcinogens). The ODCs are conceptualized as crossing the Space to invade the inside-deictic-center (IDC) entities (people). The IDCs usually consist of both actors and partners (text producers and text receivers). Such a strategy aims at showing the negative representation of the ODCs which are considered threatening and harmful to the IDCs which are positively represented. Both actors and partners (interlocutors) are within the scope of the IDCs. The negative representation raises fear and evokes preventive measures. Accordingly, the basis for motivating public approval is constituted to enhance the preventive action (Cap, 2020). The threat has a spatio-temporal and ideological nature. Hence, proximization can be considered in three aspects: spatial, temporal and axiological.

V. AXIOLOGICAL PROXIMIZATION

Cap (2013) defines axiological proximization as follows:
> Axiological proximization is a forced construal of a gathering ideological conflict between the "home values" of the DS central entities, IDCs, and the "alien", antagonistic values of the ODCs, which occupy the conceptual periphery of the DS. The IDC-ODC conflict either will, or (at least) may, lead to a physical clash, that is the materialization of the ODC ideological threat within the IDC space (p. 94).

This definition marks two distinct kinds of axiological proximization. The first involves high likelihood and it functions independently of the other proximization strategies (spatial and temporal proximization). This kind often compensates for the absence of the construals forced by spatial proximization and temporal proximization strategies. The second kind involves lower likelihood (or a probability that is less explicitly expressed) and it co-works with the spatial proximization and temporal proximization strategies. The two kinds differ in the linguistic manifestations employed. Therefore, they also differ in the degree of the pre-emptive action which they may enhance (Cap, 2013). Axiological proximization strategy mainly reflects the proximization operations that force high likelihood of the ODC-IDC clash because the other instances of axiological proximization "cannot perform legitimization compensatory function, crucial to the design of the spatial- temporal- axiological (STA) model as a whole" (p. 119).

Since axiological proximization is concerned with the values of the opposing (center vs. periphery) physical entities in the DS (IDCs vs. ODCs), categories 1 and 2 of axiological proximization denote a corresponding ideological opposition. The first two categories are stated by Cap (2013) as follows: "(1) Noun phrases (NPs) construed as IDC positive values or value sets (ideologies)"; "(2) Noun phrases (NPs) construed as ODC negative values or value sets (ideologies)" (p. 119).

For Cap (2013), juxtaposing "the IDC-positive and the ODC-negative values" is a precondition for the construal of the latter (p. 119). The ODC-negative values (carcinogen values) represent the threat that motivates the ODC (people) physical impact. Such symbolic transfer "from the ideological premise to the physical act" is the essence of axiological proximization that enhance its status as a strategy of proximization (p. 119). This way, it determines the final, third and

most important category of the axiological proximization strategy which Cap (2013) states as: "(3) Discourse forms no longer than one sentence or two consecutive sentences involving linear arrangement of lexico-grammatical phrases construing materialization in the IDC space of the ODC negative ideologies" (p. 120).

Concerning the conceptual shift, category 3 involves a complex sequential scenario which consists of two parts: the "abstract-ideological" part and the "concrete-physical" part. The "ideological" part portrays an abstract and distant vision of conflict between the IDC values and the ODC antagonistic values. Therefore, the ideological part 'unfolds to link with the other, "physical" part, which transforms the ODC ideological antagonism into a concrete, physical threat' (p. 120). What is essential to this transformation is a continuous "change in the conflict probability levels: the ideological part subsumes a remote possibility of the IDC/ODC conflict, while the physical part turns that possibility into a high probability" (p. 120). Such symbolic progression explains why the third category consists of phrases in linear arrangement (p. 120).

Table (1) summarizes the lexico- grammatical manifestations for the three categories of the axiological proximization strategy as follows:

TABLE 1
AXIOLOGICAL PROXIMIZATION STRATEGY (CAP, 2013, P. 121)

Category	Lexico- grammatical manifestation within the discourse space
1	Noun phrases (NPs) construed as IDC positive values or value sets (ideologies)
2	Noun phrases (NPs) construed as ODC negative values or value sets (ideologies)
3	Discourse forms involving linear arrangement of lexico-grammatical phrases construing materialization in the IDC space of the ODC negative ideologies

As for the treatment of pronominal substitutes for NPs in the STA strategies, Cap (2013) admits that, in proximization theory, pronominal substitutes might not always be included in the categories and, thus, do not count. The justifications he provides is that, first, in comparison with spatial proximization strategy, a proximization strategy may include "fewer NPs in the capacity of category descriptors and, thus, the pronominal substitutes can be provided explicitly" (p. 118).

VI. ANALYSIS AND DISCUSSION

Axiological proximization in scientific discourse presents a forced construal of an ideological conflict that exists between the "home values" of people as IDCs, and the antagonistic, "alien", values of carcinogens as ODCs. The IDCs occupy the conceptual center of the DS and the ODCs occupy the conceptual periphery of the DS as shown in figure (1):
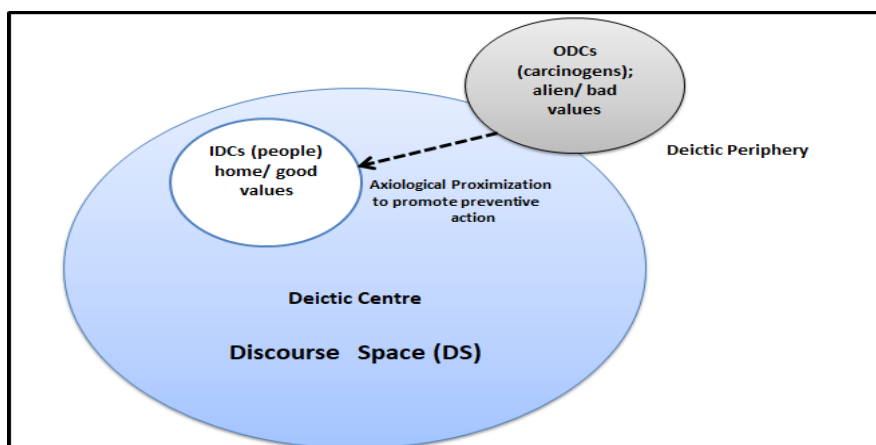

Figure 1 The Axiological Proximization of Carcinogen Risk (adopted from Cap, 2020, p. 282)

The strategy of axiological proximization consists of three categories. In category 1, the lexico- grammatical tools are NPs that are construed as IDC positive values or value sets (ideologies). In the second category, the NPs are construed as ODC negative values or value sets (ideologies). The results of analyzing the first and second categories are put in one table (table 2) since the two categories utilize the same lexico- grammatical tools to construe ideological conflicts (though with different attitudes). This way, confusion and possibility of inaccuracy can be avoided as much as possible.

The corpus analysis of these categories has been done by surveying the word list of the corpus to look for NPs that suggest positive IDC ideologies and negative ODC ideologies. Next, the concordance of each suspected NP has been thoroughly checked to assign and calculate the related instances. The File View tool has also been used in many instances for a double check.

Both categories 1 and 2 can employ NPs or single- word nominals as lexico- grammatical tools. Such tools are *health factors* and *healthy lifestyle* for the IDCs and *chronic inflammation* and *contaminated groundwater* for the ODCs. In the analysis of the corpus, the identification of the lexico- grammatical tools which establish categories 1 and

2depends on the denotative meaning of the NPs since the paper deals with scientific discourse where information is presented in a straightforward manner rather than adopting figurative language where connotative meaning is expressed. The results are presented in table (2):

TABLE 2
THE STATISTICAL RESULTS OF ANALYZING CATEGORIES 1 AND 2 OF THE AP STRATEGY

NPs of positive values for IDCs	Frequency	NPs of negative values for ODCs	Frequency
Health+ (benefit(s)/ body/ factors)	161	Risk(s)+ (factor(s))	464
safety	36	Disease(s)	76
Healthy+ diet/ people/ lifestyle/ weight/ choices/ behavior/ adults	22	Death(s)	72
		prevention	62
		Toxic+ chemicals/ environment/ bases/ effect/ etc.	40
		Problem(s)	34
		Virus(es)	29
		Damage(s)	29
		Concern(s)	29
		contamination	23
		Impurity/ impurities	20
		Chronic+ inflammation/ injury/ infection/ inhalation	19
		Harmful+ chemicals/ ingredients/ substances/ ultraviolet rays/ solar radiation/ etc	18
		Contaminated+ groundwater/ water/ soil/ bases/ equipment/ wheat	17
		inflammation	15
		infections	14
		toxins	14
		warning	14
		Dangerous+ agents/ microbes/ toxicity/ chemicals/ compounds levels	13
		Illness(es)	12
		pollution	10
		Infectious+ agents/ flatworm	9
		Tumour(s)	9
		Inflammatory+ process/ nature/ medications/ results/ compounds/ drugs/ bowls	8
		Harm(s)	8
		mutations	6
		injuries	5
		Suffering	4
		Danger	4
		pollutants	4
		toxin	4
Total instances	219	Total instances	1085

While categories 1 and 2 provide well- demarcated phrases, category 3 involves a symbolic transition from the ideological premise to the physical act. Thus, category 3 is the essence of axiological proximization and it is the most important category in the axiological proximization strategy. It is essential here to recall this category as stated by Cap (2013): "(3) Discourse forms no longer than one sentence or two consecutive sentences involving linear arrangement of lexico-grammatical phrases construing materialization in the IDC space of the ODC negative ideologies" (p. 120). Cap (2013) provides elaborative formula for this category in the form of a four phraseological paradigm saying:

> (1) NP denoting ODC value(s) followed by or combined with (2) VP denoting a remote possibility of the ODC-IDC conflict followed by (3) VP denoting a close probability of the ODC-IDC conflict followed by or combined with (4) NP denoting physical consequences of the ODC-IDC conflict (p. 120).

For illustrative purpose, example (1) exemplifies the formula above:

1. The damaging effect of the US invasion *(NP of ODC value)* has not yet been estimated *(VP of remote possibility of ODC-IDC conflict)*, but it may harm the socio- economic situation *(VP of close probability of ODC-IDC conflict)* leading eventually to socio- economic negative consequences *(NP of physical consequences of the ODC-IDC conflict)*.

However, such instances as (1) have not occurred in the corpus. Cap (2013) assures that adjacent VPs (such as *has not yet been estimated*) can be accomplished by VPs of different cases and tenses depending on the corpus under investigation. Some of the alternatives can be metaphoric expressions. Hence, Cap (2013) provides other flexible discourse forms for this category since some "fillers" (NPs and VPs) do not collocate and may not occur with some fillers of other paradigms. In such cases, the fillers may occur on their own rather than being "a part of the four-part structure" (p. 121). Such flexible discourse forms have actually occurred in the corpus as shown in the following example instance (2):

2. [I]t has to be noted that stress coping strategies may lead to increased **smoking, drinking, eating, and use of drugs, and thereby increase the risk of cancer** (https://osha.europa.eu/en/themes/work-related-diseases/work-related-cancer)

In (2), *smoking, drinking, eating,* and *use of drugs* are all materializations related to IDCs, but they reflect the negative ideologies of ODCs.

The corpus analysis of this category has been conducted by investigating the structures where NPs that nominate ODCs and the NPs of negative values for ODCs (already identified in table 2) occur. This process has been performed by inserting the related NP in the search box in AntConc and then hitting the start button to display the concordances where the NPs exist, as shown in figure (2) for the ODC *powder* (a suspected carcinogen):
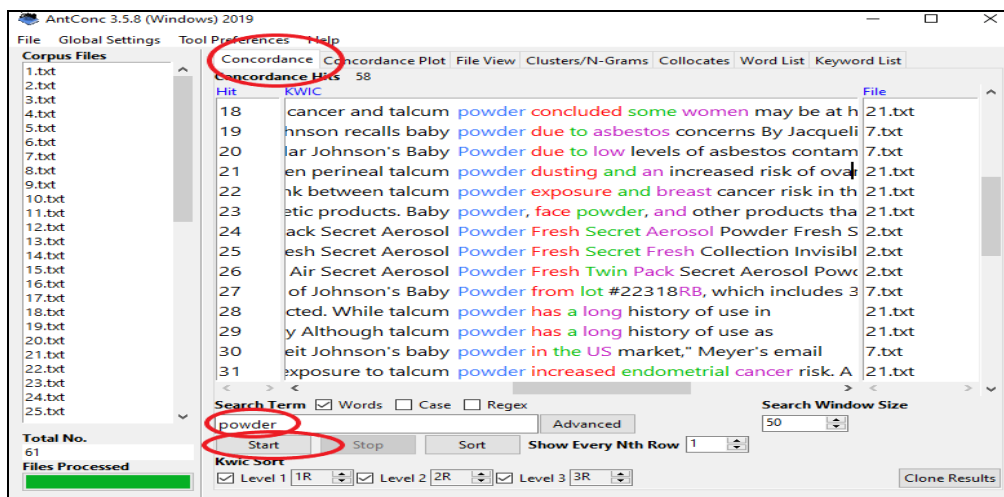

Figure 2 The Concordances of the ODC Item "powder"

Accordingly, the structures where the ODC negative values and the ODCs themselves exist are displayed to search for any conceptual shift from abstract ideological part to concrete-physical part. The results of analyzing this category are presented in table (3):

TABLE 3
THE STATISTICAL RESULTS OF CATEGORY 3 OF THE AP STRATEGY

ODC NPs and NPs of negative values for ODCs	Example instances	Frequency
Exposure	Experts evaluate several types of evidence, including studies of cancer in humans, studies of cancer in animals, sources of exposure and mechanisms (what is known about how the substance can cause cancer).	65
Factor(s)	When many studies all point to a similar association between a potential risk factor and an increased risk of cancer….	41
Risk*	Several risk factors can increase your chance of developing cervical cancer.	39
Meat(s)	Both red and processed meats are associated with a higher risk of cancer.	37
Alcohol	The risk of developing cancer increases with the amount of alcohol a person drinks.	33
Chemicals	Emphasizing that it has been known that chemicals cause mammary tumors in rodents, Rudel said that very few of these chemicals are studied in women.	30
Asbestos	[T]alc is often found in close proximity with asbestos, a hazardous substance that's known to cause inflammation and lung cancer.	26
Radiation	Talk with your doctor if you think you may be at risk for cancer because you were exposed to radiation.	19
Tobacco	People who use smokeless tobacco (snuff or chewing tobacco) have increased risks of cancers of the mouth	18
(Talcum) powder	But studies of women who are already diagnosed with ovarian cancer may sometimes find a potential connection between talcum powder use and ovarian cancer.	17
Drug(s)	[I]t has to be noted that stress coping strategies may lead to increased smoking, drinking, eating, and use of drugs, and thereby increase the risk of cancer.	15
coffee	[W]e don't really know about coffee and … which are also classified as possibly carcinogenic.	14
Smoke*	Both smoke and high-temperature cooking of certain meats are known to be carcinogenic.	12
Food(s)	However, cooking with charcoal can create carcinogens in some foods.	11
Compound(s)	That's because these foods may contain carcinogens, or compounds that cause cancer.	10
Ranitidine	[I]t's suspending the sale of Zantac and other over-the-counter ranitidine medications due to concerns they might contain a substance that can cause cancer.	10
Medication(s)	More common heartburn medications have been recalled due to the presence of an impurity that might cause cancer	10
Cigarette(s)	This adds to growing concerns about the health risks of e-cigarettes.	9
Toxi*	But while the chemical is a known potential toxin and carcinogen in its industrial form, the link between consuming it in food and developing cancer is much less clear.	9
Factor(s)	Besides chemicals … biologic factors many more factors and conditions have been identified that could cause cancer ….	9
Sanitizer(s)	An online pharmacy analyzed hundreds of brands of hand sanitizer and found some contained high levels of the carcinogen benzene.	7
Dioxane	Researchers are starting to focus on dioxane, a potential carcinogen that's starting to show up in tests of tap water.	7
Diabetes	Some foods can increase your risk of type 2 diabetes and obesity, which are associated with certain types of cancer.	6
Gas*	Gasoline … are among the largest sources of mammary carcinogens in the environment ….	5
Sunscreen(s)	Johnson & Johnson … recalled some … sunscreens after it detected low levels of the carcinogen in the products.	5
charcoal	Grilling with charcoal … is associated with creating carcinogens and increasing your risk of cancer.	5
Marijuana	More specifically … a class of organic compounds found in marijuana, are responsible for the resulting carcinogens ….	5
bacon	Experts concluded that every 50-gram portion of processed meat daily (that's two slices of bacon) increases the risk of bowel cancer by 18%.	5
Tattoo	One in five tattoo inks in Australia contain carcinogenic chemicals	4
polycyclic aromatic hydrocarbons (PAHs)	Grilling creates carcinogenic polycyclic aromatic hydrocarbons (PAHs) When meat juice drips onto coals and other hot surfaces, it causes flames and smoke.	4
Metformin	Type 2 diabetes drug metformin recalled due to contamination with possible carcinogen	3
Pollution	Air pollution is one of the many causes of climate change as well as breast cancer.	3
Zantac	[P]harmaceutical company Sanofi announced it was undertaking a voluntary recall of Zantac due to the concerns about the potential cancer-causing chemical.	3
Obesity	People with obesity may have an increased risk of several types of cancer, including cancers of the breast….	2
Total instances		498

Although axiological proximization is the most essential proximization in Cap's (2013) theory, it is the shortest in that it consists of three categories only. The results of analyzing the three categories are all put in table (4) which displays the distribution of the axiological proximization strategy categories in the corpus:

TABLE 4
THE DISTRIBUTION OF THE AP STRATEGY CATEGORIES IN THE ENGLISH CORPUS

Category	Lexico- grammatical tools within the discourse space	Total instances	Percentage of instances
1	Noun phrases (NPs) construed as IDC positive values or value sets (ideologies)	219	12.1%
2	Noun phrases (NPs) construed as ODC negative values or value sets (ideologies)	1085	60%
3	Discourse forms involving linear arrangement of lexico-grammatical phrases construing materialization in the IDC space of the ODC negative ideologies	498	27.7%
Total instances		1802	100%

The statistical results presented in table (3) are represented in the graphic representation in figure (3):
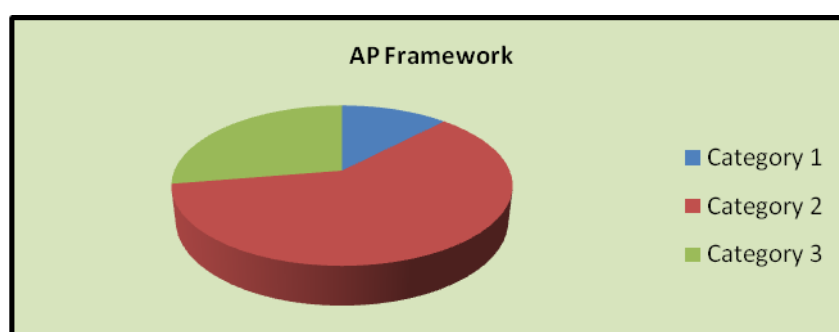

Figure 3 Distribution of Axiological Proximization Strategy Categories

According to the rates of distribution of the axiological proximization strategy categories in the corpus, the categories can be arranged on a scale of three ranks as presented in table (5):

TABLE 5
THE RANKS OF THE AXIOLOGICAL PROXIMIZATION STRATEGY CATEGORIES IN THE CORPUS

Category rank	Category NO.	Lexico- grammatical tools within the discourse space	Total instances	Percentage of instances
1st	2	Noun phrases (NPs) construed as ODC negative values or value sets (ideologies)	1085	60%
2nd	3	Discourse forms involving linear arrangement of lexico-grammatical phrases construing materialization in the IDC space of the ODC negative ideologies	498	27.7%
3rd	1	Noun phrases (NPs) construed as IDC positive values or value sets (ideologies)	219	12.1%

VII. CONCLUSIONS

Apparently, axiological proximization is achieved by the three categories which have all been employed in the corpus; none of the categories scored zero frequency. However, the categories show different rates of distribution; as shown in table (4). Accordingly, they take different ranks as shown in table (5). Hence, the following conclusions can be identified:

1. The strategy shows dominance of category 2 (NPs construed as ODC negative values) and, thus, category 2 (with 1085 instances; 60% of the total instances) comes in the first rank. These results agree with Cap's (2013) results of analyzing anti- terrorist discourse. Thus, constructing carcinogen risk through ideological conflict is mainly achieved through informing the partners with the negative values and features of these carcinogens to create a negative reaction against them. Eventually, people might take preventive actions and stay alarm of possible carcinogenic attack. The prevalence of category 2 in the corpus grants the scientific discourse a more straightforward feature and establishes more convincing arguments. The negative values assigned to the ODCs are mostly depicted in NPs with physical denotation where referents are mostly physical associations or consequences of the exposure to or the consumption of ODCs. Such NPs are *illness(es), pollution, infectious+ agents/ flatworm, tumour(s), inflammatory+ process/ nature/ medications/ results/ compounds/ drugs/ bowls, harm(s), mutations, injuries, suffering, danger* and *pollutants.*

2. The second rank is taken up by category 3 (498 instances; 27.7%) where the conceptual shift from the abstract ideological part to the concrete physical part is constructed. Hence, the corpus demonstrates a state of balance between

presenting the negative values of the ODCs and the ways these values shift physical danger that threatens the IDCs. In other words, the conceptual shift presented in category 3 rationalizes the negative values (of the ODCs) presented in category 2.

3. Both parts of the complex sequential scenario of shift are mostly physical since the topic under investigation deals with the harmful physical entities (carcinogens) that physically attack human bodies leading to physical damage. Conflict, in this case, is brought into being due to two-sided physical clash between the IDCs who struggle to maintain well- being and the ODCs that strive to ruin IDCs.

4. Category 1 (NPs construed as IDC positive values) has scored the lowest frequency (219 instances; 12.1%) in the corpus. However, these results do not indicate any negative attitude towards the IDCs. Rather, the scarcity of the IDCs and their positive values in the corpus are natural since the texts of the corpus aim at forming the legitimization of prevention actions against the ODCs and their negative effects (values). In other words, it is outside the domain of interest of the corpus to praise people (as IDCs). Thus, category one is the least well-grounded category to maintain axiological proximization.

Eventually, from a cognitive pragmatic perspective, the partners of scientific discourse on carcinogen risk seem to make their choice of category fit with the mental states that are common in this case for both actors and partners. Both actors and partners have common attention in that they are after consciously producing and receiving information about carcinogens. They also share the same belief and motivation about the negative impact of carcinogens. Such shared mental states (about the negative effect of carcinogens) control the text and gears axiological proximization towards the heavy reliance on producing as much carcinogenic negative values (category 2) as possible and towards the construal of the shift from these negative values towards the carcinogenic harm as a physical impact (category 3).

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