



RESEARCH IN LANGUAGE

FOCUS OF THE ISSUE: SPEAKER BEHAVIOUR AND POSSIBLE
NATURAL LANGUAGE PROCESSING (NLP) APPLICATIONS

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Research article

Registering the Impact of Words in Spoken
Political and Journalistic Texts**Christina K. Alexandris** *National and Kapodistrian University of Athens, Greece*✉ calexandris@gs.uoa.gr

Abstract. Words in spoken political and journalistic texts may inspire, infuriate or even become mottos. Often, the entire spoken interaction may be forgotten, yet individual words may remain associated with the Speaker and/or the group represented by the Speaker or even the individual word or words themselves obtain a dynamic of their own, outshining the original Speaker. In the current-state-of-affairs, connected with the impact of international news networks and social media, the impact of words in spoken political and journalistic texts is directly linked to its impact to a diverse international audience. The impact or controversy of a word and related topic may be registered by the reaction it generates. Special focus is placed in the registration and evaluation of words and their related topics in spoken political and journalistic discussions and interviews. Although as text types, spoken political and journalistic texts pose challenges for their evaluation, processing and translation, the presented approaches allow the registration of complex and implied information, indications of Speaker's attitude and intentions and can contribute to evaluating the behaviour of Speakers-Participants. This registration also allows the identification of words generating positive, negative or diverse reactions, their relation to Cognitive Bias and their impact to a national and international audience within a context of international news networks and social media.

Keywords: cognitive bias, associations, implied information, paralinguistic features

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INTRODUCTION

Words in spoken political and journalistic texts may inspire, infuriate or even become mottos. Often, the entire spoken interaction may be forgotten, yet individual words may remain associated with the Speaker and/or the group represented by the Speaker or even the individual word or words themselves obtain a dynamic of their own, outshining the original Speaker. This phenomenon is common and well-known, especially in political speeches and political history of the recent past. However, in the current-state-of affairs, connected with the impact of international news networks and social media, the impact of words in spoken political and journalistic texts is directly linked to its impact to a diverse international audience. Furthermore, the individual words in question are not necessary within the context of political speeches but rather within the context of interviews, debates and discussions and social media.

As text types, spoken political and journalistic texts pose challenges for their evaluation, processing and translation due to a set of typical, distinctive characteristics (Alexandris, 2020), including the existence of complex and implied information often containing indications of Speaker's attitude and intentions. This information is not always perceived or correctly understood by the recipients, particularly if an international public is concerned. Information content and its perception by the recipients is often related to Cognitive Bias.

1. Registering the Impact of Words and Related Topics

Words and the conversation-interview topics they signalize constitute the basis of most spoken interactions, but may also constitute the basis of complications in spoken political and journalistic texts, especially if non-native speakers and the international audience are concerned. This context may be regarded as a typical case in most international news networks and national or local news networks presenting topics of interest to an international audience. Interviews, debates and political discussions may contain words and related topics of particular impact or controversy to Speakers-Participants and audiences alike. These words and related topics are not restricted to sensitive and controversial issues known to a general and international public but may be indirectly linked to them or linked to less known sensitive and controversial issues. Furthermore, words and related topics related to sensitive and controversial issues may also depict the form, type, nuance and degree of sensitivity and controversy of an issue concerned, according to the diversity of political, historical and socio-cultural factors of the Speakers-Participants and audiences involved. In spoken political and journalistic texts, these properties may be described as “the devil in the details”, since overlooking or misinterpreting the above-described words and related topics result to obtaining false or incomplete information, failure of persuasion or negotiation and conflict. Analysts may pour over volumes of files, news reports and studies related to the political, historical and socio-cultural elements concerned. However, registering the

impact of words and related topics in spoken political and journalistic texts, at least from a linguistic aspect, may contribute to the analysis of data and information and training of the professionals in journalism, administration and politics.

- **Registering Reactions**

The impact or controversy of a word and related topic may be registered by the reaction it generates. Special focus is placed in the registration and evaluation of words and their related topics in spoken political and journalistic discussions and interviews.

In particular, the registration and evaluation of Speaker reactions and overall Speaker behaviour in respect to words and their related topics in spoken political and journalistic discussions and interviews provides information to the following three cases:

- (1) Speaker's reluctance to answer questions, avoidance of topics, or a polite or symbolic presence in the discussion or interview but not an active participation.
- (2) Speaker may persist on discussing the same topic of interest by repeating the same subject or may try to direct the discussion in the topic(s) or interest
- (3) Speaker purposefully creates tension in the interview or discussion.

- **Additional Dimensions of Word Content**

The words and their related topics linked to the above-described Speaker reactions and Speaker behaviour may concern additional information, beyond their lexical meaning and definition. Specifically, the additional information contained may correspond to additional dimensions of a word's meaning, namely its relations to other words and related topics, by association and its semantic meaning in relation to socio-cultural factors.

The additional dimensions of a word's meaning concerning its relations to other words and related topics by association may be described as a "horizontal" dimension of a word and word-topic in question. These "horizontal" dimensions between words and topics may either be associated by their semantic meaning or by circumstantial association.

Example 1.

- "politics" – "foreign policy" (foreign policy is a type/domain of policy)
- "Angela Merkel" – "Germany" (Angela Merkel is the Chancellor of Germany)

The additional dimensions of a word's meaning concerning its semantic meaning in relation to socio-cultural factors may be described as a "vertical" or "deep" dimension of a word and word-topic in question. The "deep" dimension of a word and word-topic is related to socio-cultural elements and can, therefore, be perceived in a different manner by native speakers and the international audience. These words, referred to as "Gravity" words and "Evocative" words (Alexandris, 2018b, Alexandris, 2020) are either related to their multiple meanings in case of polysemy or to their role in History, in Tradition, in Music and in Literature. These word and topic types are challenging to

detect, process, interpret and translate in regard to spoken political and journalistic discussions and interviews concerning non-native Speakers-participants of a language and the international audience. Typical examples are the following:

Example 2.

“Weltschmerz”: Strategiefähigkeit und Weltschmerz. Die deutsche Außenpolitik bis 2030

“Wucht”: Die geballte Wucht einer sich abwendenden Schutzmacht in Kombination mit der Infragestellung der bestehenden Ordnung durch aufstrebende Mächte und destabilisierende regionale Entwicklungen

<https://deutschland-und-die-welt-2030.de/de/beitrag/strategiefaehigkeit-und-weltschmerz-die-deutsche-aussenpolitik-bis-2030/>

The additional dimensions of a word’s meaning and the topic it describes are connected to Cognitive Bias, in particular, Lexical Bias (Trofimova, 2014), concerning its perception by its Speakers and/or recipients. Both types of “horizontal” and “vertical-deep” additional dimensions of a word and related topic are detected by registering the reaction of the Speakers and/or recipient in the spoken interaction concerned. This registration is achieved by generated visual representations of dialog flow in the spoken interaction and the depiction of points of tension between the Speakers-Participants. Both types of “horizontal” and “vertical-deep” additional dimensions of a word and related topic are described in respect to the generated graphical representations.

2. Words and Reactions: Interactive Registration

As presented in previous research (Alexandris, 2019, Alexandris, 2018a), generated visual representations of dialog flow and the general pragmatic structure of discussions and interviews (Alexandris, 2019) enable the evaluation of failure of spoken interaction, by-passing Confidence Bias (Hilbert, 2012) of the evaluators of the interview or discussion.

The generated visual representations are based on the relations of word-topics of each segment of the discussion or interview, and the perceived relations-distances between them. In the presented approach concerning an interactive system (Alexandris, 2018a), topics are defined (by the User) at a local level with the activation of the “Identify Topic” command, in respect to the question asked or issue addressed by the interviewer or moderator. This interactive topic definition, based on previous research concerning the interactive annotation of pragmatic features in transcribed journalistic texts (Alexandris et al., 2015), allows the content of answers, responses and reactions to be checked in respect to the question asked or issue addressed. Topics, treated as local variables, are registered and tracked. The automatic signalization of nouns by the Stanford POS Tagger in each turn taken by the speakers-participants in the respective segment in the dialog structure provides assistance in choice of topic (Alexandris, 2018a). We note that the use of the registered and tracked keywords, treated as local variables, is crucial

for the signalization of each topic and the relations between topics, since automatic Rhetorical Structure Theory (RST) analysis procedures (Stede et al., 2017, Zeldes, 2016) usually involve larger (written) texts and may not produce the required results.

With the activation of the “Identify Relation” command, relation types between topics are determined by the User. In the domain of journalistic texts, these relations cannot be strictly semantic and heavily rely on associations and world knowledge: automatic processes may result to errors.

The User chooses the type of relation (“Repetition”, “Association”, “Generalization” or “Topic Switch”) between the topic of the question or issue addressed with the topic of the respective response or reaction (Alexandris et al., 2015). The “Repetition” relation (“REP” tag) involves the repetition of the same word or synonym and corresponds to the generation of the shortest distance between defined topics (“Distance 1”—a short line or one dash in generated pattern). The “Association” relation (“ASOC” tag, “Distance 2”), defined by the User’s world knowledge (can be evaluated with a lexicon or WordNet) is represented as a longer line to the next word-node (a longer line or two dashes). The “Generalization” relation (“GEN” tag), also defined by the User’s world knowledge (comparable to a lexicon or WordNet) corresponds to the generation of the longest distance between defined topics (“Distance 3”—the longest line or three dashes). The “Topic Switch” relation (“SWITCH” tag) is used when the topic of a discussion or interview changes between selected topics without any evident semantic relations. “Topic Switch” (Distance -1: slash “/”) generates a break in the sequence of topics. Examples of segments in (interactively) generated patterns from user-specific choices between topics are the following (Example 3 and Example 4):

Example 3 (Alexandris, 2018a)

- “Britain”-“the UK” (REP-1)
- “propaganda”--“social-media” (ASOC-2)
- “police”---“security” (GEN-3)
- “security”/“entrepreneurship” (SWITCH- -1)

Example 4

- “Syrian Government”-“ Syrian Arab Republic” (REP-1)
- “military confrontation” -- “chemical weapons”- (ASOC-2)
- “treaties”---“international commitment” (GEN-3)
- “Cold War”/“World Cup” (SWITCH- -1)

The distances (II) between topics in the generated patterns (I) are registered as triple tuples (triplets): (Britain, the UK, 1), (propaganda, social media, 2), (police, security, 3), (security, entrepreneurship, 4) (Example 5 and Example 6):

Example 5 (Alexandris, 2018a)

- (Britain, the UK, 1)
- (propaganda, social media, 2)
- (police, security, 3)
- (security, entrepreneurship, -1)

Example 6

- (Syrian Government, Syrian Arab Republic, 1)
- (military confrontation, chemical weapons 2)
- (treaties, international commitment, 3)
- (Cold War, World Cup, -1)

The content (i) and form (ii) of the generated patterns (for example, multiple breaks) as visual representations of Cognitive Bias target to depict:

- (1) Degree in which all topics are addressed.
- (2) What topics are avoided – either by changing a topic or by persisting to address the same topic: Observed to be evident in length and form of generated pattern.
- (3) How participants may be lead or even forced into addressing a topic – by association or generalization: This is also observed in length and form of generated patterns.

Therefore, targeting to by-pass Confidence Bias (Hilbert, 2012) of users-evaluators (II), the above-presented points allow the determination of the Speakers-Participants in the conversation (or interview) who were successful in their spoken interaction and the Speakers-Participants who were less successful.

3. Graphic Representations of Word-Relations and Reactions

As described above, the generated graphic representation is based on the relations of the topics to each other, including distances from one word to another. In previous research (Alexandris, 2018a, Alexandris et al. , 2015), Distances 1, 2 and 3 were depicted as vertical lines from top to bottom, in the case of the generation of a tree-like structure, or as horizontal lines from left to right, in the case of the generation of a graph. Topic switches were depicted as breaks in the continuous flow of the generated graphic representation, generating a new, disconnected point or node. This approach envisioned a possible further development with graphic forms similar to discourse trees (Carlson et al., 2001, Marcu, 1999), however, it presented difficulties in matching points of the generated structure to the respective segments of the spoken text.

The present approach targets to allow the alignment of the generated graphic representation with the respective segments of the spoken text, facilitating a possible integration in transcription tools (Mourouzidis et al., 2019).

Similarly to the approaches presented in previous research (Alexandris, 2018a, Alexandris et al., 2015), the length of the lines between points corresponding to topics depends on the type of distance to the next word-node, with the shortest line corresponding to the relation of “Repetition”, related to Distance 1 and the longest line corresponding to the relation of “Generalization”, Distance 3.

In the present application, henceforth referred to as “PRAG-GRAPH” (Alexandris, 2020), Distances 1, 2 and 3 correspond to the respective values “1”, “2” and “3” ($y=1$, $y=2$ and $y=3$) depicted in the generated graphic representation. The “Topic Switch” relation (“New Topic”) is assigned value “-1” (Figure 1).

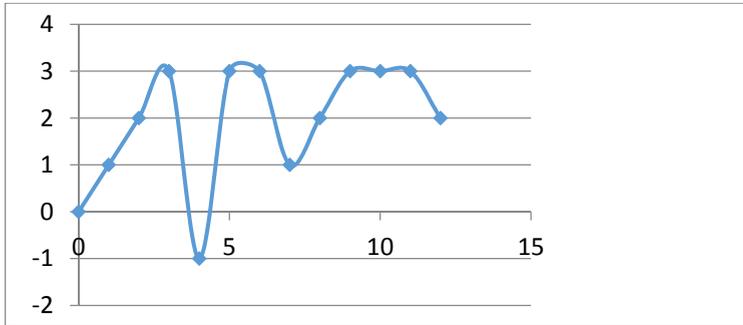


Figure 1. Distances and values between topics (Mourouzis, Floros and Alexandris, 2019)

The starting point of the graphic representation of the spoken interaction depicted in Figure 4.4.1 is point zero (0) in the time frame (x), where $(x,y) = (0,0)$. From point 0 there is an occurrence of two (2) keywords and one “Repetition” relation between them, represented as value “1” in the y axis (y), where (REP): 1, corresponding to point (1,1) (Mourouzis et al., 2019).

From the 1st to the 2nd point ($x=2$) of spoken interaction, the 3rd keyword demonstrates an “Association” relation with the previous, 2nd keyword, represented as value “2” in the y axis (y), where (ASOC): 2, corresponding to point (2, 2).

In the 3rd point of spoken interaction, there is one more 4th keyword and its relation with the previous, 3rd keyword is an “Generalization” relation, represented as value “3” in the y axis (y), where (GEN): 3, corresponding to point (3,3).

In the 4th point of spoken interaction, the 5th keyword demonstrates a “New Topic” relation with the previous, 4th keyword, represented as value “-1” in the y axis (y), (NEW TOPIC): -1, corresponding to point (4,-1).

Two “Generalization” relations follow in the spoken interaction, where the relation between the 6th keyword and the previous, 5th keyword and the following 7th keyword is represented as value “3” in the y axis (y), where (GEN): 3, corresponding to points (5,3) and (6,3).

Between the 6th point and the 7th point there is a “Repetition” relation between keywords, represented as value “1” in the y axis (y), where (REP): 1, corresponding to point (7,1). The 8th point is related to the previous 7th point with an “Association” relation between keywords, represented as value “2” in the y axis (y), where (ASOC): 2, corresponding to point (8,2).

A sequence of three “Generalization” relations follow in the 9th to 11th point in the spoken interaction, where the relation between the 10th keyword and the previous, 9th keyword and the following 11th and 12th keywords is represented as value “3” in the y axis (y), where (GEN): 3, corresponding to points (9,3), (10,3) and (11,3).

Finally, in the 12th point of spoken interaction, there is one more 13th keyword and its relation with the previous, 12th keyword, is an “Association” relation between them (ASSOC): 2, corresponding to point (12, 2) (Mourouzis et al., 2019).

• Graphic Representation and Relation Type

Empirical data so far demonstrates a predominance of “Association” relations, a slightly lower occurrence of “New Topic” and “Generalization” relations and a low occurrence of “Repetition” relations. In the following examples (Figures 2-5) we present dialogue segments of 12 seconds (12 sec) with 13 word-topics and 12 relations between each word-topic, where x = the instances of keywords within the time frame and y = relation between two topics (Mourouzidis et al., 2019).

A remarkable predominance of specific types of relations results to the generation of characteristic types of graphic representations. As previously described above, the overall shape of the generated graphic representation is dependent on the mostly occurring relation types in the discourse structure of the interview or discussion. (Mourouzidis et al., 2019) The graphic representation in Figure 2 demonstrates a high frequency of “Repetition” relations with a development around the value $y=1$ level, with eight (8) registered “Repetition” relations. The generation of a graphic representation of multiple high peaks is illustrated in the example in Figure 3 corresponding to transcripts of available online interviews. The characteristic plateau-like shape (Mourouzidis et al., 2019) of the peaks in the generated graphic representation is affected by the relatively high percentage of “Association” relations on the value $y=2$ level.

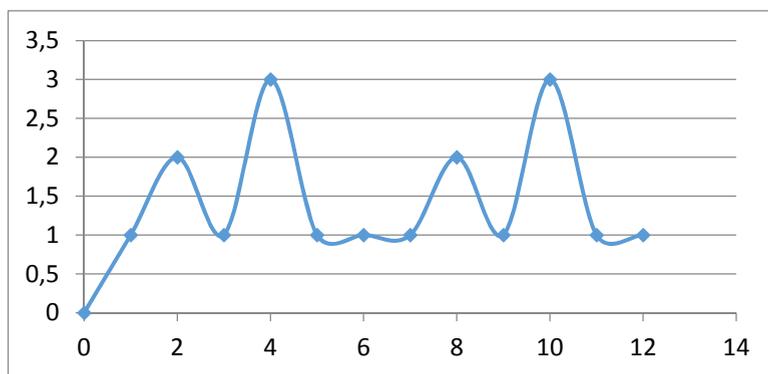


Figure 2. Generated graphical representation with a “Repetition” relation (Mourouzidis, Floros and Alexandris, 2019)

Characteristic graphic representations are generated with a relatively high percentage of “New Topic” (change of topic –“Topic Switch”) relations, creating a notable sequence of sharp peaks with multiple sharp drops in the value $y=1$ level (Figure 4) (Mourouzidis et al., 2019). The characteristic high plateau-like shape of the peaks in the generated graphic representation (Mourouzidis et al., 2019) is generated by the relatively high percentage of “Generalization” relations on value $y=3$ level, in which the “Generalization” (GEN) relation between topics is repeated seven (7) times (Figure 5).

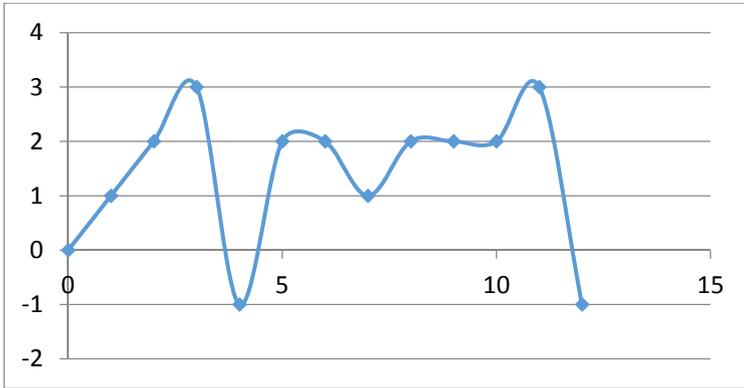


Figure 3: Generated graphical representation with multiple “Association” relations (Mourouzidis, Floros and Alexandris, 2019)

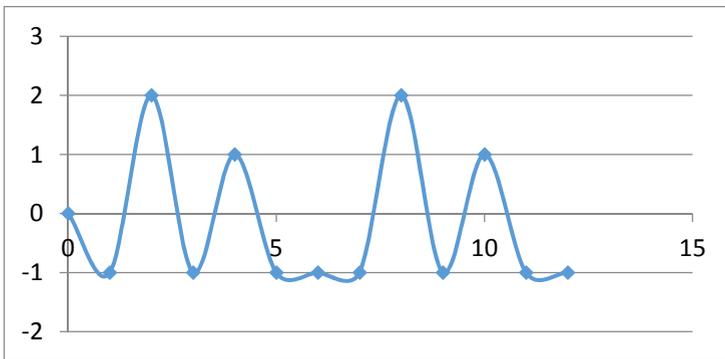


Figure 4. Generated graphical representation with multiple “Topic Switch” relations. (Mourouzidis, Floros and Alexandris, 2019)

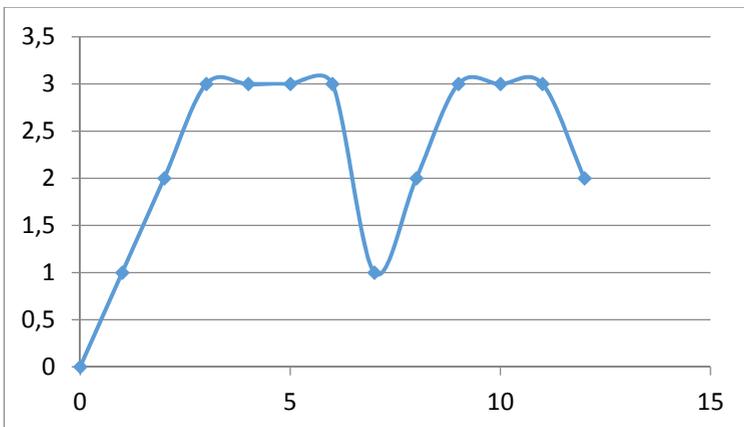


Figure 5. Generated graphical representation with multiple “Generalization” relations. (Mourouzidis, Floros and Alexandris, 2019)

4. Words, Word-Relations and Cognitive Bias

Associations and other types of relations between words can be related to Cognitive Bias, in particular, Lexical Bias (Trofimova, 2014) and can also be used to evaluate interviews or discussions and the existence of Cognitive Bias between the Speakers-Participants. The evaluation of spoken interactions may also concern any existing Confidence Bias (a category of Cognitive Bias) (Hilbert, 2012) of the evaluator.

The following definitions of Confidence Bias (Hilbert, 2012) and Lexical Bias (Trofimova, 2014) are presented as types of Cognitive Bias:

- “The *confidence bias* originates in the internal uncertainty of the judge, rather than environmental uncertainty regarding the objective evidence (like conservatism or the exaggerated expectation bias). It refers to subjective uncertainty about the objective facts (see Wagenaar & Keren, 1985). More specifically, the confidence bias is the experimentally confirmed fact that we tend to be overconfident in our judgments when we are fairly certain about something, and under confident when we have a high level of subjective uncertainty (for discussions see Keren, 1997; Liberman & Tversky, 1993; McClelland and Bolger)” (Hilbert, 2012).

- Lexical Bias: “Methodological considerations of studies investigating the semantic perception of lexical material: The main challenge in studying the semantic perception of words is the diversity of meanings and associations that people attribute to the words. Meaning appeared to be individually unique and different not only between people from different cultures, social and family background, but also between all individuals” (Trofimova, 2014).

Simultaneously, the perceived relations-distances between word-topics perceived by the User, related to the above-stated type of Lexical Bias (Trofimova, 2014), are generated and measured in the above-presented form of triple tuples (Example 5 and Example 6). Varying degrees of familiarity and bias with topics discussed in spoken journalistic texts result to different perceptions of successful conversations or debates. Therefore, evaluators may “forgive” any complications or mistakes.

It is also observed that data from transcriptions and respective visual representations created so far indicates cases of observed differences between identified topic relations among some journalists that are non-native speakers of English (especially in respect to “ASOC” and “SWITCH”). Differences may in some cases be attributed to lack of world knowledge of the language community concerned (Paltridge, 2012, Hatim, 1997, Wardhaugh, 1992), particularly in non-native speakers. This implies that the international audience may often perceive and receive different and/or incomplete information in respect to evaluating conversation and interaction (Yu et al., 2010, Alexandris, 2010, Ma, 2010, Pan, 2000). Topics and words generating diverse reactions and choices from Users result to the generation of different forms of generated visual representations for the same conversation or interaction (Example 7):

Example 7 (Alexandris, 2018a)

- “Country Z” – “defence spending” (ASOC) or (SWITCH)
- “Country Z” — “defence spending” (ASOC)
- “Country Z” / “defence spending” (SWITCH)

In Example 7, the “Country Z” (in this case, the United States of America) can be associated with “defence spending” for the American audience (ASOC). For an international audience, the concepts “United States of America” and “defence spending” may be perceived as unrelated to each other and are, therefore, evaluated as a change of topic (SWITCH) in a discussion or interview.

• **Lexical Bias in “Gravity” and “Evocative” words**

Lexical Bias (Trofimova, 2014) concerning the semantic perception of words is observed to be associated with “Gravity” and “Evocative” words (Alexandris, 2018b), constituting commonly used, semantically “primitive” nouns, verbs, adjectives or adverbs that may sometimes be problematic when it comes to their correct interpretation and transfer in another language. Both “Gravity” words and “Evocative” words are related to socio-cultural elements and can, therefore, be perceived in a different manner by native speakers and the international audience. Differences in the perception of “Gravity” and “Evocative” words may be linked to Cognitive Bias in regard to their meaning and to the evaluation of the overall spoken interaction.

In the research presented, Cognitive Bias is attributed to a large extent to current political and context-specific associations which may vary among Speakers. However, “Gravity” words (for example, “country” or “people”) and “Evocative” words may be the same for many Speakers belonging to the same native language and/or same language community (Alexandris, 2020). (Example 8, Example 9 and Example 10).

Example 8 (Alexandris, 2020).

Fragments of interviews and relation of topics (names of countries, nations and people withheld):

- Citizens – Laws – *National* – state – *country* Nationals – minority group – people – country – *country’s* culture – nationalist – nationalism – violence – Law

Example 9 (Alexandris, 2020).

Fragments of interviews and relation of topics (names of countries, nations and people withheld):

- Country’s Economy – country’s people – country’s Economy – country’s people – country’s foreign policy (with country X) – country X’s people – country’s Xs foreign policy (with other countries) – country’s people

Example 10

Fragments of interviews and relation of topics: Sequence of associations (names of countries, nations and people withheld):

- military confrontation – chemical weapons – strikes – danger – crisis – consequences – punishment

It is often observed that the semantic equivalent of the same word in one language sometimes may appear more formal or with more gravity than in another language. These words with “gravity” in their meaning may either emphasize the role of the word in an utterance or be related to word play and subtle suggested information. In particular, the presence of such words may contribute to the degree of formality or intensity of conveyed information in a spoken utterance.

These differences between languages are often related to polysemy, where the possible meanings and uses of a word seem to “cast a shadow” over its most commonly used meaning. Therefore, the most commonly used meaning, appearing as the “first” meaning in a dictionary, online lexicon or translation memory, may not always correspond to a correct transfer in the target language.

For example, the word “lazy” has a negative connotation in English, but in some contexts, it is also associated with the meaning of “laid back” (“a lazy afternoon”). The equivalent of “lazy” in German, the word “faul” may, in some contexts, appear to be of too negative “gravity” to accurately correspond to the English word “lazy” (Alexandris, 2018b). We note that in German the word “faul” also means “rotten”, for example, “faule Eier” (“rotten eggs”). Another example of polysemy which may be related to the “gravity” of a word connected to its multiple meanings is “logos” in Greek, which is connected to meanings such as “speech”, “logic”, “intelligence”, “reason”, “word of honour”, “ratio” (in mathematics) and even “God” (in religious texts) (Alexandris, 2018b).

Furthermore, some words may contain semantic features characterizing them with exact opposite of “gravity”, namely a lack of “gravity”. A typical example is the word “pink” in American English (Example 11), even the word “nice” (Example 12), as opposed to the word “trust” (Example 12). In both cases, “Gravity” is observed to be a feature to apply in both cases and can be marked as either “+ Gravity” or “-Gravity”.

Such words can often be related to Lexical Bias concerning semantic perception (Trofimova, 2014) (presented in the following section). International speakers may misinterpret the intention of a native speaker due to the “gravity” of words in their native tongue: Word play and subtle suggested information may often be unnoticed by an international public in political discussions and interviews.

Words with perceived “gravity” in their semantic content that can create complications in their correct interpretation, transfer and/or processing are linked to the following properties: (a) Commonly used, semantically “primitive” nouns, verbs, adjectives and adverbs and (b) Polysemy – multiple uses and meanings.

Example 11 (Alexandris, 2020)

“**pink**” (American English)

pink (“tickled pink” – American English: very pleased)

<https://dictionary.cambridge.org/dictionary/english/tickled-pink>

pinkie/ pinky = the smallest finger of a person’s hand (American English)

<https://dictionary.cambridge.org/dictionary/english/pinkie#translations>

and that really, truly, deep down and with a pinky swear,

<https://www.theatlantic.com/politics/archive/2018/07/the-russians-are-coming/565478/>

Example 12 (Alexandris, 2020)

Transcribed Spoken Test:

Foreign Minister Sergey Lavrov’s interview with BBC HardTalk 720-16-04-2018

Question: You say there is no **trust**. You mean zero **trust** now between Russia and the United States?

Sergey Lavrov: I said they are losing the last remnants of trust – which is not yet zero.

Question: Not yet zero. I just wonder: as Foreign Minister of Russia when you wake up in the morning and you read on Twitter the words of the United States President and the Commander-in-Chief saying in essence: Get ready Russia; our nice, new, smart missiles are coming – what do you make of that?

Sergey Lavrov: Well that the President of the United States writes his tweet.

Question: And your response to those tweets is?

Sergey Lavrov: Well, the proof of the pudding is in the eating, as you know. So, we waited for these smart new – what else was there? – **nice** missiles to be used at the attack and we calculated that two thirds of them did not reach their target because they were intercepted.

Another word group that can be related to Lexical Bias concerning their semantic perception (Trofimova, 2014) is a group which we refer to as “evocative” words. Similarly to the above-described category, “evocative” words are commonly used, semantically “primitive” nouns, verbs, adjectives or adverbs. Their evocative element concerns their “deeper” meanings related to their use in Tradition, in Music and in Literature and sometimes may be related to emotional impact in discussions and speeches.

Since this word category concerns common every-day words, their evocative features are less obvious and are not always consciously used or perceived by native speakers. As in previously presented words with “gravity” in their meaning, with “evocative” words, word play and subtle nuances in expressions may often be unnoticed by an international audience.

In contrast to “Gravity” words, “Evocative” words usually contribute to a descriptive or emotional tone in an utterance. These common words may be related to concepts such as colours, for example, “grau” (“grey”) in German or the natural world, for example, “thalassa” (“sea”) in Greek or “moon” in English.

Words with “evocative” usage in specific contexts often co-occur with words with a positive or a negative connotation or with a scholarly or vulgar usage. For example, the word “Hund” (German: “dog”) co-occurs with the word “Verlierer” (German: “loser”) and is used with its evocative properties (Example 13).

Example 13 (Alexandris, 2020)

<https://www.berliner-zeitung.de/politik/kommentar-zum-aerger-in-der-cdu-angela-merkel-muss-ihren-politischen-nachlass-regeln-29639694>

Berliner Zeitung, 20.07.2018

Entsetzen, Enttäuschung und Unruhe zeigt sich schließlich in ihrer Partei, die darin zumindest fürs Erste (mal) sogar die SPD übertrifft, was man erstmal schaffen muss. Wochen- und monatelange Verhandlungen sind vorbei, die Phase der Ungewissheit beendet – und die CDU schleicht sich davon wie ein geprügelter **Hund**, ein reichlich gefledderter Verlierer, und die Müdigkeit der Vorsitzenden nach langen Nächten tut ihr Übriges. Ein Aufbruch soll die neue Regierung qua Eigendefinition vermitteln. Der größte Partner überlässt das erstmal den anderen.

[...]

Erneuerung ist das Stichwort – das Interessante ist, dass die Erneuerung darin bestehen soll, ein Stück weit zurückzukehren zur „alten CDU“, wenn auch nicht gleich zum Kinder-Küche-Kirche-Modell vielleicht.

These words are not easily detected with automatic procedures. However, in many cases they either receive prosodic emphasis and/or their phonetic-phonological features are intensified when articulated by native speakers. These elusive words are linked to the following properties: (a) Commonly used, semantically “primitive” nouns, verbs, adjectives and adverbs, (b) Commonly used in tradition, in music and in literature and (c) Often have prosodic and phonetic-phonological features intensified. The intensification of phonetic-phonological features and/or the use of prosodic emphasis in “evocative” words underlines the “deeper” levels of the semantics of the word in question.

This inherently “deep”, complex semantic information is stressed but not determined by Prosody. “Gravity” words and “Evocative” words can be related to language-specific and culture-specific word categories with similar complex semantics and characteristics defined in other languages such as “Kenayah” (allusion) words in Arabic and Persian (Kheirandish and Dorri, 2013).

The detection and processing of “Gravity” and “Evocative” words is not easily integrated in automatic procedures. A more realistic approach would be including this

word group in post-processing procedures with the aid of resources identifying typical contexts in which the words occur, as well as possible collocations (Alexandris, 2020). The use of transcribers or other speech processing tools is required for the integration and processing of distinctive phonetic and phonological features or any other form of special prosodic features, if applicable (Alexandris, 2020).

5. Words Generating Tension in Spoken Interviews and Discussions

Word-topics may also be linked to the generation of tension between Speakers-Participants. Word-topics may ignite tension by Association, but also by any existing socio-culturally determined semantic features, such as the case of “Gravity” and “Evocative” words. Points of possible tension and/or conflict between Speakers-Participants are referred to as “hot spots” in previous research (Alexandris, 2019, Alexandris 2020). In this case, the words and related topics related to the generation of tension between Speakers-Participants may be detected in the signalized points of tension. Special emphasis is placed in discussions and interviews containing larger speech segments where there is a specific agenda and a defined protocol in turn-taking (in contrast to spontaneous turn-taking, among other turn-taking forms, Taboada, 2006, Wilson and Wilson, 2005, Sacks et al., 1974). In the case of discussions and interviews containing larger speech segments, phenomena signaling tension and conflict such as avoidance or switching of topic (Alexandris et al., 2015) or interruptions are less common than the case of multiparty-discussions or interactions with small speech segments. However, in the case of larger speech segments, tension can be registered with the detection and signalization of “hot spots”, as described in previous research (Alexandris, 2019, Alexandris 2020).

• Signalizing Points of Tension in Spoken Interviews and Discussions

The signalization of “hot spots” is based on the violation of the Quantity, Quality and Manner Maxims of the Gricean Cooperativity Principle (Grice, 1975). Cognitive Bias is registered by comparing content of the Speaker turns in the signalized “hot spots” and assigning a respective value (Alexandris, 2019).

In a discussion or interview, “hot spots” concern speech segments where there is a recognition of speaker turns, namely a switch between Speaker 1 and Speaker 2 by the Speech Recognition module of the System / transcription tool. Even if Speakers-Participants display a calm and composed behaviour, the signalization of multiple “hot spots” indicates a more argumentative than a collaborative interaction.

A “hot spot” (Alexandris, 2019) consists of the pair of utterances of both speakers, namely a question-answer pair or a statement-response pair or any other type of relation between speaker turns. In the case of automatic detection, (Alexandris, 2019), the first 60 words of the second speaker’s (Speaker 2) utterance are processed (approximately 1–3 sentences, depending on length, with the average sentence length of 15–20 words, Cutts, 2013) and the last 60 words of the first speaker’s (Speaker 1) utterance are processed (approximately 1–3 sentences, depending on length).

The speaker turns are extracted to a separate template for further processing, containing not only the detected segments but also the complete utterances consisting of both speaker turns of Speaker 1 and Speaker 2.

Example 14. Signalization of multiple “hot spots” in a spoken text segment (Alexandris, 2020).

Spoken text (Overview):

(S1 /S2 = Speaker1 / Speaker 2) Speaker turns in a transcription tool:

Speaker1 / [text]

Speaker 2 [text]

--- {...}

Speaker 1 / [text] [**hot-spot-1**]

Speaker 2 [text] [**hot-spot-1**]

--- {...}

Speaker 1 / [text]

Speaker 2 [text]

--- {...}

Speaker 1 / [text] [**hot-spot-2**]

Speaker 2 [text] [**hot-spot-2**]

--- {...}

Speaker 1 / [text] [**hot-spot-3**]

Speaker 2 [text] [**hot-spot-3**]

--- {...}

Speaker 1 / [text]

Speaker 2 [text]

--- {...}

Speaker 1 / [text] [**hot-spot-4**]

Speaker 2 [text] [**hot-spot-4**]

--- {...}

Speaker 1 / [text]

Speaker 2 [text]

--- {...}

Speaker 1 / [text] [**hot-spot-5**]

Speaker 2 [text] [**hot-spot-5**]

--- {...}

Prosodic emphasis is included in the conditions related to “hot spot” identification (Alexandris, 2019). Specifically, for a segment of speaker turns to be automatically identified as a “hot spot”, at least two of the following three conditions (1), (2) and (3) must apply to one or to both of the Speaker’s utterances:

(1) “Additional, modifying features: In one or in both speakers’ utterances in the segment of speaker turns there is at least one phrase containing a sequence of two adjectives (ADJ ADJ) (a) or an adverb and an adjective (or more adjectives) (b) (ADV ADJ) or two adverbs (ADV ADV) (c). These forms of adjectival or adverbial phrases

are detectable with a POS Tagger (for example, the Stanford POS Tagger)” (Alexandris, 2019).

(2) “Reference to the interaction itself and to its participants with negation. In one or in both speakers’ utterances, the subject of the sentence containing the negation is “I” or “you” ((I/You) “don’t”, “do not”, “cannot”) (a) and in the verb phrase (VP) there is at least one speech-related or behaviour verb-stem referring to the dialogue itself (b) (for example, “speak”, “listen”, “guess”, “understand”). This applies to parts of speech other than verbs (i.e. “guessing”, “listener”) as well as to words constituting parts of expressions related to speech or behaviour (“conclusions”, “words”, “mouth”, “polite”, “nonsense”, “manners”). The different forms of negation are detectable with a POS Tagger. The respective words and word categories may constitute a small set of entries in a specially created lexicon or may be retrieved from existing databases or WordNets” (Alexandris, 2019).

(3) “Prosodic emphasis and/or Exclamations. (a) Exclamations include expressions such as such as “Look”, “Wait” and “Stop”. As in the above-described case (2), the respective words and word categories may constitute a small set of entries in a specially created lexicon or may be retrieved from existing databases or WordNets. (b) Prosodic emphasis, detected in the speech processing module, may occur in one or more of the above-described words of categories (1a, 1b, 1c, 2a and 2b) or in the noun or verb following (modified by) 1a, 1b and 1c” (Alexandris, 2019).

Conditions (1), (2) are directly or indirectly related to flouting of Maxims of the Gricean Cooperative Principle (Grice, 1975). In condition (1), the Speaker violates the Maxim of Quantity in the Gricean Cooperative Principle.

Specifically, in 1a, 1b and 1c, there is extra information added to the basic content of the utterance consisting the necessary information required to fulfil the Maxim of Quantity of the Gricean Cooperative Principle (“Do not make your contribution more informative than is required”).

Condition (2) implies a violation of the Gricean Cooperative Principle in respect to the Maxim of Quality (“1. Do not say what you believe to be false”, “2. Do not say that for which you lack adequate evidence”, Grice, 1975) and/or in respect to the Maxim of Manner (Submaxim 2. “Avoid ambiguity”, Grice, 1975) in the utterance of the previous Speaker. In the case of 2a and 2b, the Speaker perceives a violation of the Gricean Cooperative Principle by the previous Speaker. Here, in 2a and 2b, the content of the Speaker’s utterance refers to the dialogue itself, mostly functioning as a comment and is not limited to the current topic in question. The content of the previous Speaker’s utterance is considered to be unacceptable, ambiguous, false or controversial by the Speaker (Alexandris, 2019).

In an average time of discussions and interviews containing larger speech segments in the Media (30–45 minutes), the benchmark for evaluating a remarkable degree of tension in a discussion is signaled by multiple “hot spots” detected and not sporadic occurrences of “hot spots”. Thus, the number of 12 “hot spot” occurrences in longer speech segments in question (30–45 mins) signalizes a low degree of tension.

A remarkable degree of tension in a 30–45 minute discussion or interview is related to a number of at least 4 detected “hot spots” (where the number of 3 hot spots constitutes a marginal value). A typical example of a dialogue with many detected points of possible tension and/or conflict between Speakers-Participants is an approximately 32 minute long interview with seven (7) registered “hot spots” (Example: BBC – British Broadcasting Corporation: HARDtalk interview by journalist Stephen Sackur on 16th April 2018, name of interviewee withheld).

In a semi-automatic procedure of “taking the temperature” of a transcribed dialogue, the number of detected points of possible tension and/or conflict between Speakers-Participants is measured and calculated in relation to the duration of the discussion or interview in the Media (Alexandris, 2019). Specifically, the benchmark for evaluating a remarkable degree of tension concerns the calculation of the time of discussion / interview (for example, 35 mins) and the number of “hot spots” detected in Speaker turns. The defined benchmark (Y) for evaluating Speaker behaviour is the number of minutes divided by the number of identified speech segments signalized as “hot spots” which should contain a single digit number (< 10), if the above-described minimal number of at least 4 detected “hotspots” is calculated. For example, in a 35 minute interview with a number of 5 (five) detected “hotspots”, the value is “7” (seven). In this example, the value is below the “Tension” benchmark ($Y < 10$) and, therefore, the interview is considered to contain several points of possible tension and/or conflict between Speakers-Participants (Alexandris, 2019).

- **Words Generating Tension in Spoken Interviews and Discussions**

The signalized “hot-spots” as points of tension between Speakers-Participants may be depicted as a shaded area (Alexandris et al., 2020) in the above-presented generated graphic representations as visual representations of dialog flow and the general pragmatic structure of discussions and interviews (Mourouzidis et al., 2019). Since the generated visual representations are based on the relations of word-topics of each segment of the discussion or interview, with the activation of the “Identify Relation” command (Mourouzidis et al., 2019), words and word-topics generating tension may also be identified by the User. This is illustrated by the following example:

Example 15. Words generating “hot spots” in a spoken text segments

Speaker 1 / [text-chemical weapon] [**hot-spot-1**]

Speaker 2 [text] [**hot-spot-1**]

Speaker 1 / [text-agreement with Country Y] [**hot-spot-1**]

Speaker 2 [text] [**hot-spot-1**]

Speaker 1 / [text-(human) rights] [**hot-spot-1**]

Speaker 2 [text] [**hot-spot-1**]

The generated points of tension and/or conflict and related benchmarks contribute to an evaluation of Speakers-Participants behaviour and intentions during the interaction.

6. Evaluation of Speaker Behaviour and Further Research

The above-described features, graphic representations, word sequences and values enable the evaluation of the behaviour of Speakers-Participants, depicting possible instances of Lexical Bias (Cognitive Bias) and may also serve for by-passing Confidence Bias of the User-Evaluator of the recorded and transcribed discussion or interview. Furthermore, the above-presented information also allows the identification and detection of additional, “hidden” illocutionary acts not restricted to “Obtaining Information Asked” or “Providing Information Asked”, as defined by the framework of the interview or discussion (Mourouzidis et al., 2019). In spoken discussions and interviews, the illocutionary act (Searle, 1969, Austin, 1962) performed by the Speaker concerned may not be restricted to “Obtaining Information Asked” or “Providing Information Asked” and other or additional intentions regarding presence and role in the interaction may be involved. For example, a Speaker may focus in (purposefully) creating tension in the interaction, in emphasizing opinion (or the policy of the network concerned) or in consistently avoiding the topics addressed and not sharing any information, demonstrating a mere presence in the discussion or interview.

Speech acts performed by one or multiple Speakers-Participants usually involve complex illocutionary acts beyond the defined framework of the interaction. This feature differentiates speech acts in two-party or multiparty discussions or interviews from task-specific dialogues (Tung et al., 2013) and typical collaborative dialogues (Wang et al., 2013, Yang et al., 2012). In particular, the illocutionary acts not restricted to “Obtaining Information Asked” or “Providing Information Asked” may be related to one or more categories of speech acts concerning less explicitly expressed Speaker intentions. These speech acts and their respective illocutionary acts cannot be defined, since they are not explicitly expressed (Alexandris, 2020).

However, three frequently detected categories of pointers to implied (“Hidden”) Speech Acts are presented, namely the “Presence”, “Express Policy” and “Make Impression” pointers. We note that all three Speech Act pointers may be connected to each other and may even occur at the same time. The “Make Impression” Speech Act pointer is distinguished from the other two Speech Act pointers since it is identifiable on the Prosodic-Paralinguistic Level (Mourouzidis et al., 2019, Alexandris, 2020).

The “Presence” (Speech Act) pointer is identified by the Speaker’s reluctance to answer questions, avoidance of topics, or a polite or symbolic presence in the discussion or interview but not an active participation. Besides the Speaker’s silence (Silence/No Answer) as response to questions or statements, a “Presence” pointer is signaled by remaining in the same “safe” topic by repeating the same subject (“Repetition”) or by introducing a “safer” and more general topic (“Generalization”) or a

different topic (“New Topic or Topic Switch”). “Presence” Speech Act pointers can be identified by a high frequency of one or more of the above-described relations, especially in combination with instances of no response (Silence/No Answer) (Du et al., 2017, Mourouzidis et al., 2019, Alexandris, 2020).

With the “Express Policy” pointer, there is a direct or even blatant expression of opinion or policy. In this case, the Speaker may persist on discussing the same topic of interest by repeating the same subject (“Repetition”) or may try to direct the discussion in the topic(s) or interest by “Topic Switch” (“New Topic”). In contrast to the case of the “Presence” pointer, in the “Express Policy” pointer the repeated topic(s) or the topics introduced are all – or almost all – semantically or associatively related (Mourouzidis et al., 2019, Alexandris, 2020). With the “Make Impression” Speech Act pointer, the Speaker purposefully creates tension in the interview or discussion. This is distinguished from the previous Speech Act pointers in respect to features in the Prosodic-Paralinguistic Level of one (or all) of the Speakers, including rise of amplitude, prosodic emphasis and other prosodic features, gestures and facial expressions (Mourouzidis et al., 2019) (Alexandris, 2020).

The above-described pointers of pointers to implied (“Hidden”) Speech Acts may also be linked to applications such as alternative approaches to Sentiment Analysis strategies, since they revolve around the role of words and the relations between them. However, in this type of application several factors should be taken into account, including the link of the words and their relations with the Prosodic Level and the Paralinguistic Level. In applications such as Sentiment Analysis, the visibility of all types of the information content, including information not uttered should not be excluded. Information not uttered is not only restricted to features in the the Prosodic Level and the Paralinguistic Level but also in the reaction and overall behaviour of the Speakers-Participants. include the processing. Registering and analysing Speaker behaviour contribute to achieving visibility of various types of the information content. Visibility of all information content facilitates its processing in Natural Language Processing (NLP) applications, including Machine Translation and Data Mining (Opinion Mining-Sentiment Analysis, Information Extraction, Information Retrieval and other Data Mining applications). Even though most recent NLP applications process word groups and word sequences with the use of neural networks, the complexity of the content of spoken political and journalistic texts requires annotated corpora, at least as initial training and test sets. This can be achieved with the registration and analysis of Speaker behaviour, which can produce the appropriate type of annotated corpora.

The above-described evaluation of Speaker behaviour and possible Natural Language Processing (NLP) applications are based on the identification and registration of word and word topics and the relations between them as well as on the identification and registration of word and word topics and the respective reactions linked to them, either by Speakers-Participants or by the audience.

The above-described approaches allow the registration of complex and implied information, indications of Speaker’s attitude and intentions and can contribute to

evaluating the behaviour of Speakers-Participants. This registration also allows the identification of words generating positive, negative or diverse reactions, their relation to Cognitive Bias and their impact to a national and international audience within a context of international news networks and social media.

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