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# Exploring Linguistic Features in COVID-19 Editorials: A Multidimensional Analysis of *The Express Tribune*

**Sumera Shan Ahmad[1], Prof. Dr. Muhammad Asim Mahmood[2]**
[1]PhD Candidate, Dept. Applied Linguistics, Government College University, Faisalabad, Pakistan, and Lecturer at University of Management and Technology, Lahore
sumera495@gmail.com
[2]Dean, School of Social Sciences & Humanities, Government College University, Faisalabad, Pakistan
masimrai@gmail.com

## Abstract

*The purpose of the current research is to assess the approaches of the texts of editorials written during Covid-19. In order to achieve this goal, editorials from The Express Tribune were selected because this newspaper is available online and is among top five read newspapers of Pakistan. As corpus of the study, two hundred editorials were collected which were specifically related to Covid-19. Biber's Multidimensional model which is known as Old MD has been used for the analysis. After collecting and compiling, the data has been tagged through MAT Tagger. The obtained raw data has been processed using factor analysis. The results have revealed that the editorials written on Covid-19 are not persuading directly to the readers rather implicitly they have drawn the attention of the readers towards the subject. Moreover, they have used formal language and are written precisely.*

Keywords: The Express Tribune, editorials, MD analasis, Covid-19, linguistic features

## 1. Introduction

A horrible situation has been created with the advent of Covid-19 in which many lives have been wasted around the globe. Hardly there might be any country which is saved from Covid-19. Covid-19 has not only affected the health and increased the death rate but also it has severely affected education system and economy too. Other than these issues, another major issue is disinformation regarding covid-19. The material available related to covid-19 may or may not be true. A few pieces of information might be altered to capture the minds of the masses (Hua & Shaw, 2020). So, it's very challenging to trace out the truth which may be possible through the analysis of different texts. Current research analyzes the texts of editorials of 'The Express Tribune' by applying Biber's multidimensional model.

### 1.1. Research Question

How the application of Biber's multidimensional model can be used to evaluate distribution of text types and linguistic features in five dimensions in the editorials of The Express Tribune?

## 2. Literature Review

Data from media source has been taken in the research of Zafran, et al (2021). They have analyzed two speeches of the Prime Minister of Pakistan at that time. Those speeches were on the subject of fund raising and were in April, 2021. The data was analyzed by using Fairclough's 3D model. The research of research of Zafran, et al (2021) and the current research both have collected data from media sources. Both the data were related to Covid-19. However, the differences are; current research is on editorials and their research is on speeches, current research has analyzed the data with the help of multidimensional analysis and their research has used Fairclough's 3D model.

Another corpus-based study has been conducted on the editorials previously by Ali and Sheeraz (2018). Their research has gathered the data from print media sources unlike current study

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which has gathered the data electronically. Their data was analyzed at two levels. Initially the corpus has been collected, and analyzed through MD analysis presented by Biber in 1988 and created five dimensions. Secondly, for further analysis, three factors ANOVA was used. As per the results of the research, different sections of the newspaper are more explicit, contain less information and are less argumentative. Their study is diachronic in nature as it was conducted over a certain period of time. However, current research is synchronic.

## 3. Methodology

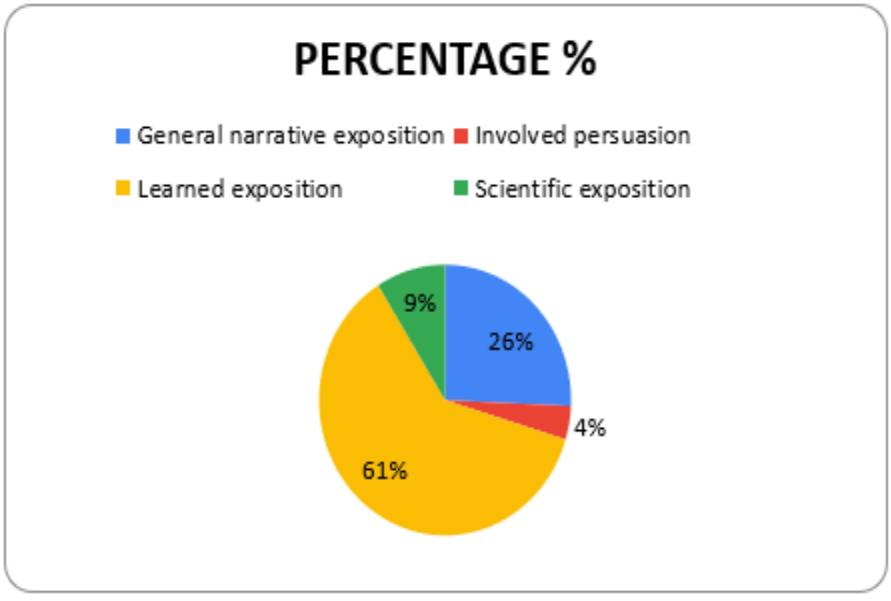
A specialized corpus comprising editorials from 'The Express Tribune' has been selected. For this purpose, two hundred editorials having 72,863 words have been considered. All of these editorials are written on the subject of Covid-19 starting from 1st March, 2020 to 4th August 2022. These editorials will be analyzed by applying Biber's MD analysis. MD analysis involves the steps of collection of data, its compilation, tagging through the software of MAT tagger, normalization of the data, application of principle factor analysis, and finally computation of dimensional scores.

## 4. Results and Discussions

Seven dimensions have been prescribed by Biber in his multidimensional model but current research has considered only five dimensions out of them because only these five are relevant to the data. The figure below shows the ratio of text types. The percentage shows that there is a bent towards learned exposition which is 61.4%. It reflects that the editorials of TET are written in expository style.

**Figure 1**

*Pie Chart representation*




The raw data from TET has been extracted by using MAT tagger. That raw data has been shown in the table below. Following table shows mean, range, standard deviation, maximum and minimum values of all dimensions. It further helps in finding eigen values.

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**Table 1**
*Descriptive Statistics of the Corpus*

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| Linguistic Feature | Mean | Minimum Value | Maximum Value | Range | Standard Deviation |
|---|---|---|---|---|---|
| AMP | -0.316138614 | -1.04 | 4.85 | 5.89 | 1.228155503 |
| ANDC | -0.21980198 | -0.94 | 2.73 | 3.67 | 0.726905744 |
| AWL | 1.426138614 | 0.2 | 3.83 | 3.63 | 0.61546238 |
| CAUS | -0.295544554 | -0.65 | 4.06 | 4.71 | 0.735140089 |
| CONC | 0.131683168 | -0.63 | 8.5 | 9.13 | 1.637170773 |
| COND | -0.451485149 | -1.14 | 3.5 | 4.64 | 1.033016347 |
| CONJ | 0.784059406 | -0.75 | 9.25 | 10 | 1.71139252 |
| DEMO | -1.042772277 | -2.36 | 1.71 | 4.07 | 0.986138042 |
| DEMP | -0.270792079 | -0.96 | 4.06 | 5.02 | 0.934713521 |
| DPAR | -0.270792079 | -0.96 | 4.06 | 5.02 | 0.934713521 |
| DWNT | 0.448712871 | -1.25 | 4.81 | 6.06 | 1.786027247 |
| EMPH | -0.292871287 | -1.5 | 3.05 | 4.55 | 0.947737661 |
| EX | -0.348019802 | -1.22 | 2.83 | 4.05 | 1.085478714 |
| FPP1 | -0.718217822 | -1.04 | 0.78 | 1.82 | 0.427423434 |
| GER | -0.304752475 | -1.84 | 5.16 | 7 | 1.358753542 |
| HDG | -0.437128713 | -0.46 | 0.77 | 1.23 | 0.13784293 |
| INPR | -0.598019802 | -0.7 | 1.15 | 1.85 | 0.394266458 |
| JJ | 0.913465347 | -0.96 | 3.68 | 4.64 | 0.858503856 |
| NEMD | 0.255049505 | -1 | 10.48 | 11.48 | 2.133138356 |

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| | | | | | |
|---|---|---|---|---|---|
| NN | 2.512376238 | -0.42 | 8.63 | 9.05 | 1.482946492 |
| NOMZ | 1.266732673 | -0.91 | 4.31 | 5.22 | 1.111304737 |
| OSUB | 2.561089109 | -0.91 | 12.91 | 13.82 | 3.332899309 |
| PHC | 2.327920792 | -1.26 | 13.7 | 14.96 | 2.164592025 |
| PIN | 0.352277228 | -1.39 | 3.85 | 5.24 | 0.96716067 |
| PIT | -0.298712871 | -1.45 | 2.35 | 3.8 | 0.93065747 |
| PLACE | 0.758613861 | -0.91 | 5.35 | 6.26 | 1.301534502 |
| POMD | -0.43049505 | -1.66 | 4.46 | 6.12 | 1.293506379 |
| PRED | 0.457623762 | -1.81 | 5.15 | 6.96 | 1.922074998 |
| PRMD | -0.044059406 | -1.33 | 5.9 | 7.23 | 1.421139105 |
| RB | -2.173267327 | -3.54 | 1.05 | 4.59 | 0.963950319 |
| SPP2 | -0.681683168 | -0.72 | 0.52 | 1.24 | 0.163896732 |
| SYNE | -0.681683168 | -0.72 | 0.52 | 1.24 | 0.163896732 |
| THAC | -0.43039604 | -1.06 | 4.38 | 5.44 | 1.062753895 |
| THVC | 0.16 | -0.5 | 6.5 | 7 | 1.406750156 |
| TIME | 0.422574257 | -1.14 | 5.86 | 7 | 1.563403117 |
| TO | -0.344554455 | -1.49 | 4.31 | 5.8 | 1.020976518 |
| TOBJ | 0.216435644 | -2.66 | 3.48 | 6.14 | 1.258521024 |
| TPP3 | 0.325841584 | -0.73 | 5.45 | 6.18 | 1.382579667 |
| TSUB | -0.991089109 | -1.33 | 0.18 | 1.51 | 0.290805437 |
| TTR | 1.085445545 | -0.5 | 7.5 | 8 | 1.99569563 |
| VBD | -0.16009901 | -5.26 | 2.1 | 7.36 | 1.649685118 |
| VPRT | -1.202178218 | -2.23 | 0.45 | 2.68 | 0.610138679 |
| XX0 | -0.728910891 | -1.39 | 3.11 | 4.5 | 0.713648234 |
| [BEMA] | -1.685742574 | -2.98 | 0.57 | 3.55 | 0.736689007 |
| [BYPA] | 0.044158416 | -0.62 | 6.46 | 7.08 | 1.261456513 |
| [CONT] | -0.657128713 | -0.73 | 0.05 | 0.78 | 0.163084865 |
| [PASS] | 0.404752475 | -1.45 | 4.44 | 5.89 | 1.196354959 |
| [PASTP] | 1.36 | -0.25 | 15 | 15.25 | 3.074760153 |
| [PEAS] | 0.822277228 | -1.65 | 5.29 | 6.94 | 1.552948087 |
| [PIRE] | -0.274752475 | -0.64 | 2.45 | 3.09 | 0.825941395 |
| [PRESP] | -0.274752475 | -0.64 | 2.45 | 3.09 | 0.825941395 |
| [PRIV] | 1.808118812 | -0.59 | 11.59 | 12.18 | 2.303945621 |

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| | | | | | |
|---|---|---|---|---|---|
| [PROD] | -0.86019802 | -1.73 | 0.42 | 2.15 | 0.548809585 |
| [PUBV] | -0.742079208 | -0.86 | 0.51 | 1.37 | 0.258140725 |
| [SERE] | 0.773069307 | -1.43 | 6.13 | 7.56 | 1.678722575 |
| [SMP] | 3.12 | -0.25 | 33.5 | 33.75 | 5.426725532 |
| [SPAU] | -0.390990099 | -0.8 | 2.4 | 3.2 | 0.768257125 |
| [SPIN] | -0.434356436 | -2.2 | 4.76 | 6.96 | 1.590542307 |
| [STPR] | 3810 | 0 | 41000 | 41000 | 9010.765783 |
| [SUAV] | 0.596138614 | -0.94 | 5.32 | 6.26 | 1.345514749 |
| [THATD] | -0.461287129 | -0.76 | 1.22 | 1.98 | 0.426651294 |
| [WHCL] | -0.176039604 | -0.6 | 2.9 | 3.5 | 0.910837065 |
| [WHOBJ] | -0.695544554 | -0.82 | 2.82 | 3.64 | 0.491016243 |
| [WHQU] | 0.076336634 | -0.33 | 15.83 | 16.16 | 1.822973792 |
| [WHSUB] | -0.337524752 | -1.05 | 5.3 | 6.35 | 1.134887136 |
| [WZPAST] | 0.078811881 | -0.81 | 3.55 | 4.36 | 0.852002684 |
| [WZPRES] | 1.365742574 | -0.89 | 8.33 | 9.22 | 1.797549079 |

The above table presents the frequency of every linguistic feature in the corpus. Those features which have been occurred in a few texts have shown higher values of range.

**Table 2**

*Eigen Values of the Factor Analysis*

| **Eigenvalue** | | | | |
|---|---|---|---|---|
| Dimension 1 | Dimension 2 | Dimension 3 | Dimension 4 | Dimension 5 |
| 33877 | 1340.8 | 2911.4 | 2072.9 | 1794 |
| **% OF VARIANCE** | | | | |
| Dimension 1 | Dimension 2 | Dimension 3 | Dimension 4 | Dimension 5 |
| -0.16 | 0.02 | 0.04 | -1.00E-04 | 0.03 |

Dimension one and dimension four have negative mean values as per above table. It reflects that the texts of editorials are less involved and more informational. The following scree plot shows that dimension one has highest number of features as compared to other dimensions and then there is a sharp break in other dimensions.

**Figure 2**

*Scree Plot*

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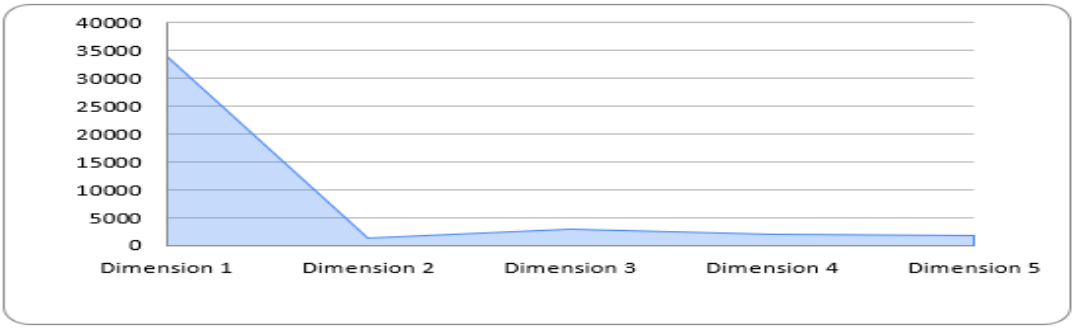


The negative mean values of dimension one and four show that these editorials have covert expression of persuasion.

**Table 3**

*Descriptive Statistics of all dimensions*

| Linguistic Feature | Mean | Minimum Value | Maximum Value | Range | Standard Deviation |
|---|---|---|---|---|---|
| Dimension 1 | -16.6180198 | -30.1 | 11.01 | 41.11 | 7.657522448 |
| Dimension 2 | 1.530693069 | -5.22 | 9.26 | 14.48 | 3.32294305 |
| Dimension 3 | 4.17019802 | -3.65 | 11.85 | 15.5 | 3.398451112 |
| Dimension 4 | -0.01029703 | -9.27 | 14.25 | 23.52 | 4.552922898 |
| Dimension 5 | 3.164356436 | -2.85 | 10.57 | 13.42 | 2.797598762 |

Table three reflects correlational matrix. The values are from -1 to 1. Direct relation is represented through positive values and inverse relation is represented through negative values. According to this table, there is highest positive correlation in dimension one and dimension four.

**Table 4**

*Inter-dimensional Correlations*

| COORELATION | | | | | |
|---|---|---|---|---|---|
| | Dimension1 | Dimension2 | Dimension3 | Dimension4 | Dimension5 |
| Dimension1 | 1 | | | | |
| Dimension2 | -0.152387012 | 1 | | | |
| Dimension3 | -0.27203784 | -0.06512134 | 1 | | |
| Dimension4 | 0.436164093 | -0.151055533 | 0.06002158 | 1 | |
| Dimension5 | -0.091005894 | 0.254682055 | 0.102585839 | 0.107937675 | 1 |

#### 4.2.2.1. Dimension 1: Involved Vs Informational

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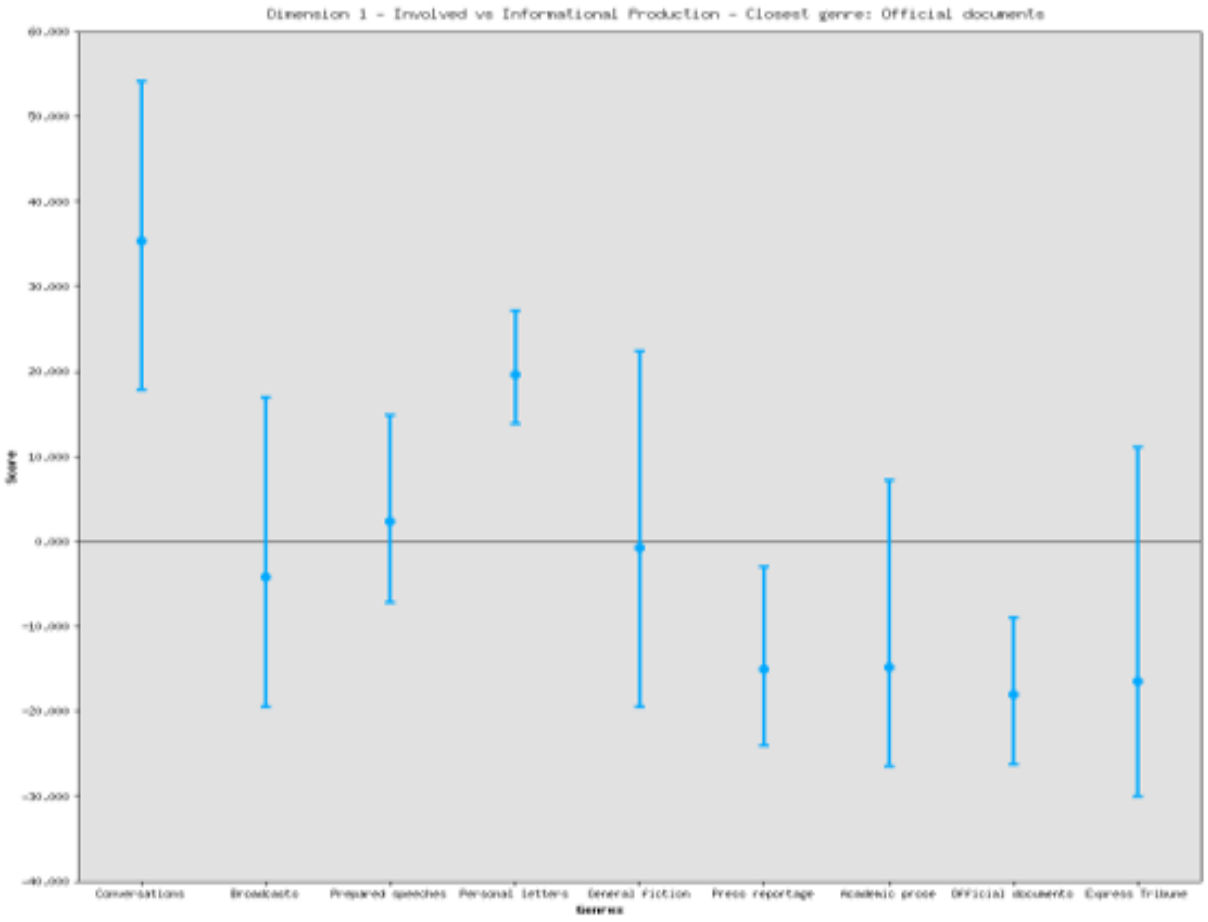
Figure 5 reflects that official documents is the closest text type in dimension one hence the editorials are more informative and less involved.

**Figure 3**
*Dimension 1*




The next table represents the frequencies of the positive and negative linguistic features in the data.

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**Table 5**
*Factorial Structure*

| Dimension 1 | | | |
|---|---|---|---|
| **Negative Linguistic Feature** | | **Positive Linguistic Feature** | |
| PRIV | -0.86 | SERE | 3.12 |
| THATD | -0.46 | AWL | 1.43 |
| CONT | -0.66 | PLACE | 0.76 |
| VPRT | -1.2 | PASS | 0.4 |
| SPP2 | -0.68 | WZPRES | 1.37 |
| DEMP | -0.27 | WZPAST | 0.08 |

The cut off point according to Biber is 0.35. The values of seven linguistic features are less than this cut off point so they have to be excluded from the analysis. The linguistic features which are on the negative side have higher values which means in dimension one, texts are more informational. Specifically, adverbs have been used more frequently to explain the situation of Covid-19 such as;

Since_IN the_DT virus_NN first_RB appeared_VBD in_IN China_NNP 's_POS Wuhan_NNP city_NN on_IN November_NNP 17_CD ,_, 2019_CD ,_, it_PRP has_VBZ been_VBN exactly_RB 397_CD days_NNS ._.

**4.2.2.2. Dimension 2: Narrative Vs Non-narrative**

According to the following figure, the closest text type is press reportage at dimension two.

**Figure 4**
*Dimension 2*

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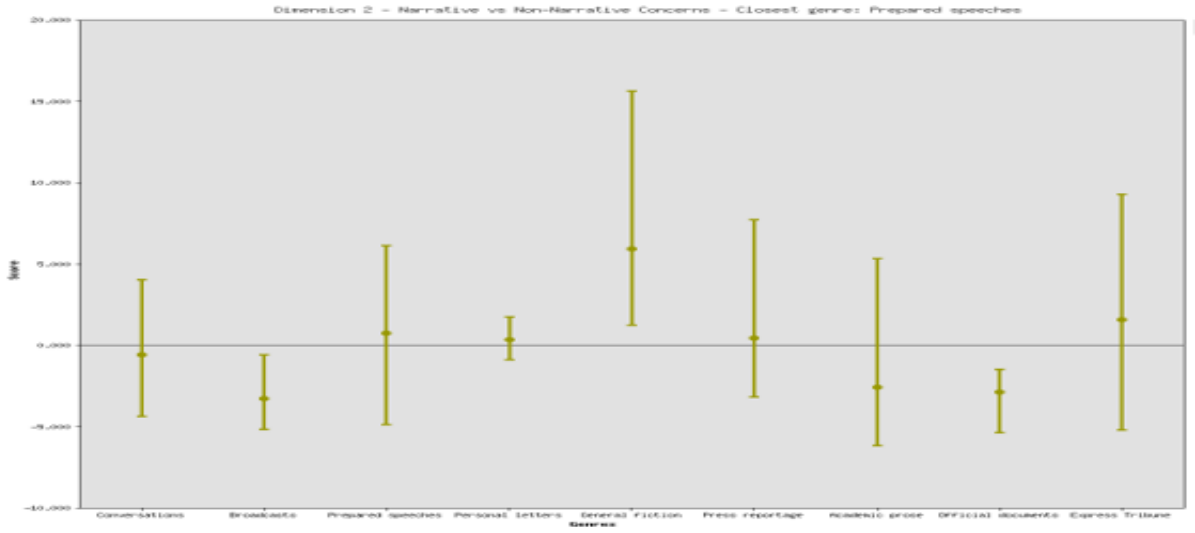


**Table 6**

*Factorial Structure of Dimension 2*

| **Dimension 2** | | | |
|---|---|---|---|
| **Negative Linguistic Feature** | | **Positive Linguistic Feature** | |
| VBD | -0.24 | PEAS | 0.82 |
| TPP3 | -0.99 | PRESP | 1.81 |
| VPRT | -1.2 | AWL | 1.43 |
| XX0 | -0.73 | PUBV | 0.77 |
| | | WZPAST | 0.08 |

The above table shows that the three linguistic features on the negative side have higher values than the cut off point. Out of these features, present tense has the highest value. It indicates that the language of the editorials has a narrative touch as apparent from following example;

Perceived_VBN information_NN credibility_NN was_VBD found_VBN to_TO be_VB associated_VBN with_IN lower_JJR levels_NNS of_IN negative_JJ emotional_JJ responses_NNS -LRB-_-LRB- e.g._FW ,_, nervousness_NN ,_, helplessness_NN -RRB-_-RRB- and_CC a_DT higher_JJR level_NN of_IN observance_NN of_IN self-protective_JJ measures_NNS -LRB-_-LRB- e.g._FW ,_, hand_NN washing_VBG -RRB-_-RRB- ._.

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### 4.2.2.3. Dimension 3: Explicit Vs Situation Dependent Reference

In dimension three of TET, the closest text type is academic prose. The texts of the editorials are is more explicit and less situation dependent. These texts have been elaborated explicitly.

**Figure 5**

*Dimension 3*

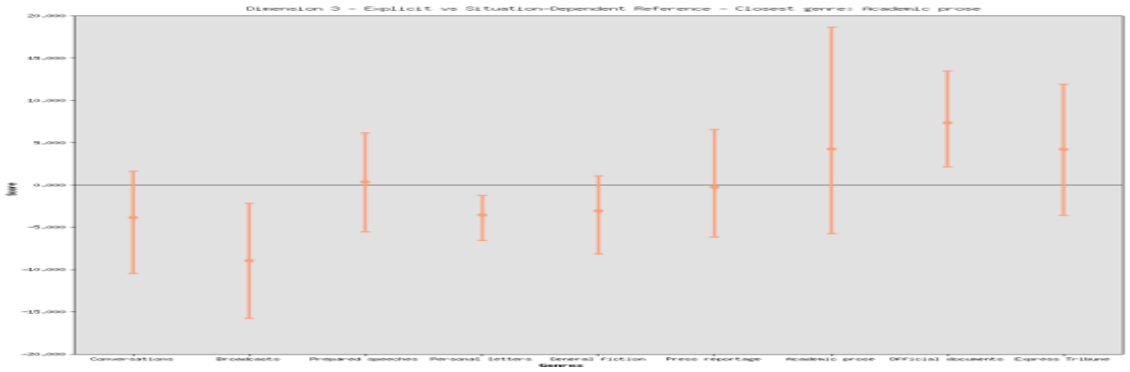

**Table 7**

*Factorial Structure of Dimension 3*

| **Dimension 3** | | | |
|---|---|---|---|
| **Negative Linguistic Feature** | | **Positive Linguistic Feature** | |
| WHOBJ | -0.7 | PHC | 2.33 |
| PIRE | -0.27 | NOMZ | 1.27 |
| WHSUB | -0.34 | PLACE | 0.76 |
| TIME | -0.34 | | |
| RB | -2.17 | | |

The factorial structure given in above table shows that on negative side, only two features have values more than the cut off point. However, on the positive side, three features have higher values example of which is given below;

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November_NNP 12_CD ,_, 2020_CD :_: PHC_NNP Chief_NNP Justice_NNP Waqar_NNP Ahmed_NNP dies_VBZ of_IN coronavirus_NN Peshawar_NNP High_NNP Court_NNP Chief_NNP Justice_NNP Waqar_NNP Ahmed_NNP Seth_NNP succumbed_VBD to_TO the_DT novel_NN coronavirus_NN ,_, after_IN fighting_VBG the_DT battle_NN for_IN 15_CD days_NNS ._.

The higher values of positive features show that the texts are explicit rather than situation dependent.

#### 4.2.2.4. Dimension 4: Overt Expression of Persuasion

On dimension four, official document is the closest text type. In editorials written on Covid-19, there is care and formality expressed through their language which means they are overtly expressive.

**Figure 6**

*Dimension 4*

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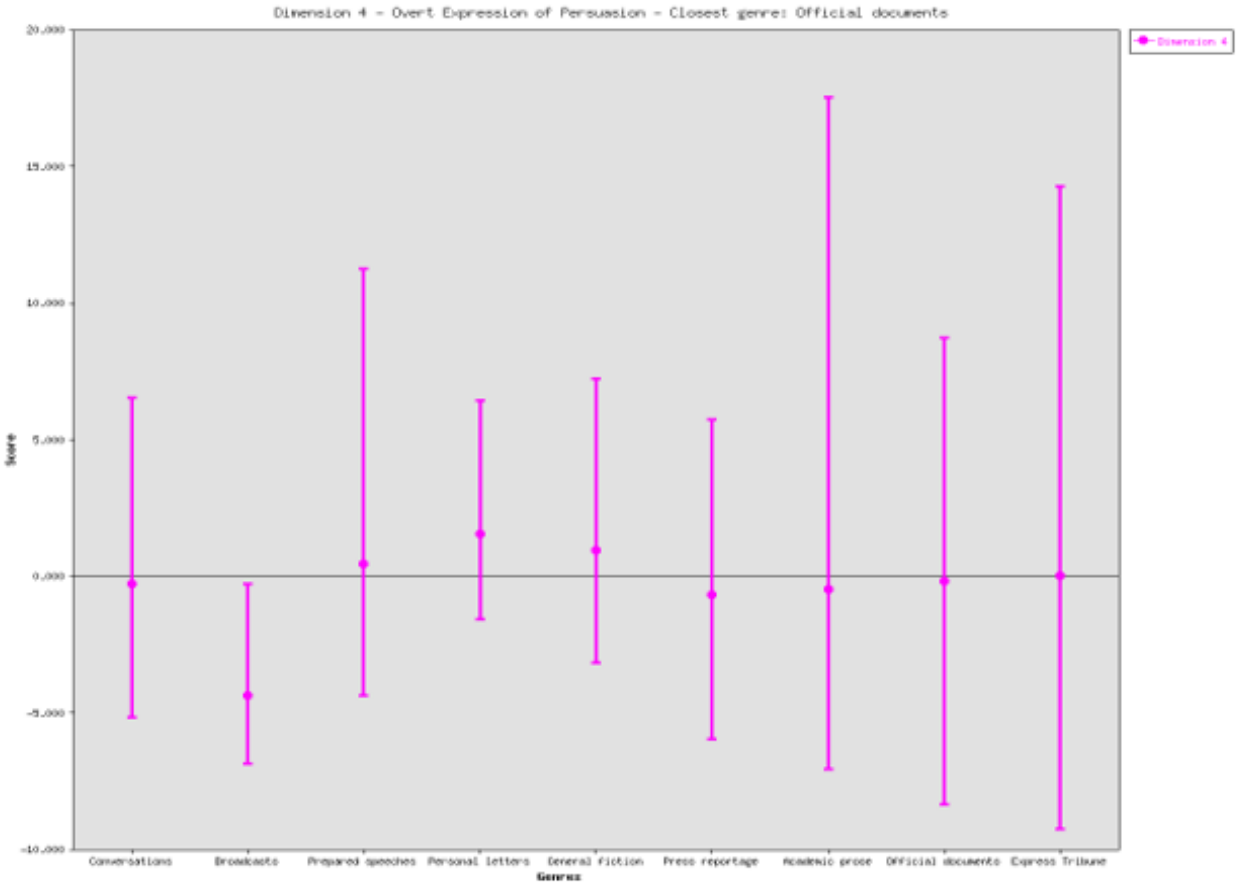


There are equal number of features at both sides i.e. three at negative and three at positive side. However, the value of negative features is more than the positive ones. The words like unless, as long as, whether, otherwise have been used more frequently such as;

People_NNS leaving_VBG the_DT city_NN from_IN airports_NNS ,_, train_NN stations_NNS and_CC shuttle_NN bus_NN stations_NNS need_VBP to_TO show_VB proof_NN of_IN a_DT negative_JJ Covid-19_JJ test_NN within_IN three_CD days_NNS ,_, unless_IN they_PRP were_VBD transiting_VBG ,_, the_DT city_NN said_VBD in_IN a_DT statement_NN late_RB on_IN Sunday_NNP ._.

**Table 8**

*Factorial Structure of Dimension 4*

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| Dimension 4 | | | |
|---|---|---|---|
| **Negative Linguistic Feature** | | **Positive Linguistic Feature** | |
| PRMD | -0.04 | TO | 0.22 |
| COND | -0.45 | NEMD | 0.26 |
| SPAU | -0.43 | SUAV | 0.6 |

### 4.2.2.5. Dimension 5: Abstract Vs Non-abstract Information

On dimension five again official document is the closest text type.

**Figure 7**

*Dimension 5*

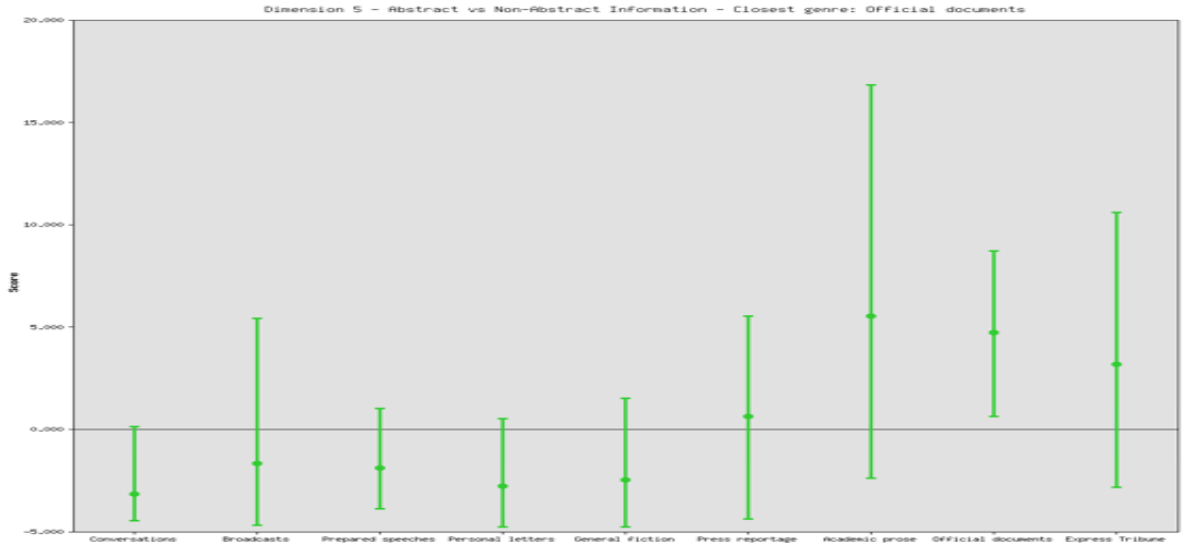


**Table 9**

*Factorial Structure of Dimension 5*

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| Dimension 5 | | | |
|---|---|---|---|
| **Negative Linguistic Feature** | | **Positive Linguistic Feature** | |
| TTR | -0.16 | CONJ | 0.78 |
| | | PASS | 0.4 |
| | | PASTP | 1.36 |
| | | BYPA | 0.04 |
| | | OSUB | 2.56 |
| | | PRED | 0.46 |
| | | WZPAST | 0.08 |

As given in table 9, there is only one linguistic feature at negative side and that also has the value less then the cut off point. However, on the positive side, there are seven linguistic features and highest occurring feature is adverbial subordinators like since, while, etc. as given in the example below;

In_IN recent_JJ months_NNS the_DT normalcy_NN index_NN rose_VBD as_IN restrictions_NNS were_VBD eased_VBN ,_, to_TO 79_CD points_NNS -LRB-_-LRB- where_WRB 100_CD is_VBZ equivalent_JJ to_TO average_JJ pre-pandemic_JJ behavior_NN -RRB-_-RRB- --_: its_PRP$ highest_JJS level_NN since_IN March_NNP 2020_CD ._.

## 5. Conclusion

Out of five dimensions of TET, three dimensions i.e. dimension one, dimension four, and dimension five have a trend of official documents. However, dimension two has closest text type of prepared speeches and dimension three has academic prose. All of these trends and frequent usage of above mentioned linguistic features show that the texts of editorials on Covid-19 were written in formal language in precise manner. Also, they were implicitly persuading the readers towards the subject matter.

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