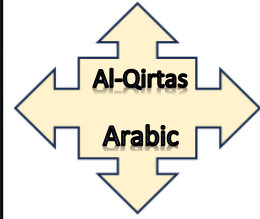


Emotion Mining of The Unwomanly Face of War and Red Birds



Dr. Zafar Ullah*
Alishba Fatima
Uzma Arshad

Assistant Professor, Department of English, University of Education, Lahore, zafarullah@ue.edu.pk
English Teacher, Pak Turk School, Islamabad, alishbafatima012@gmail.com
Senior Lecturer Department of English, CUST, Islamabad at-arshad@cust.edu.pk

Abstract

An increase in distant reading and technological innovations facilitate linguists to create accurate data visualization and knowledge patterns efficiently. This methodological paper reveals positive and negative sentiments from the selected novels to detect and validate their genre. It is problematic and time-consuming to decipher positive and negative sentiments with quantified knowledge during close reading; therefore, digital tools empower us to conduct sentiment analysis accurately. There is a need to determine the co-relationship of sentiments of the selected two war novels with their genres. A team of linguists designed Inten Check to conduct emotion-mining. Here, the mixed-method study reports that the word 'war' has been used 69 times in Red Birds and 662 times in The Unwomanly Face of War. The words "kill", "cry", and "death" are mentioned 31, 17 and 27 times, respectively, in Red Birds, and 126, 73 and 86 times, respectively, in The Unwomanly Face of War. In conclusion, the most frequently quoted words express the emotions of anger, sadness, fear and disgust, while the least cited words express the emotions of joy and surprise in both novels.

Keywords: Inten Check, Emotion mining, War, The Unwomanly Face of War, Red Birds

Introduction

This research focuses on the emotion-mining of the comparative study of 2015 Nobel laureate Svetlana Alexievich's novel, The Unwomanly Face of War and Muhammad Hanif's Red Birds. Emotion mining is a process through which sentiments, emotions, tone and genre of a text are detected and analysed. Human feelings towards different issues, events or other interests are evaluated with emotion-mining techniques. The study discusses how emotion words portray the theme of war in the selected literary texts, comparing the occurrence of emotions in the two novels. Big data literary texts and complete works of a writer are available online today. It becomes challenging to infer sentiments manually, as big data are expanding with the technological revolution, manual sentiment analysis with accuracy and fast speed at run time has become a big challenge. Inten Check is a digital tool by Intentex Ltd to analyse sentiments efficiently and accurately. This research study discusses emotional categorisation in war texts. It illustrates how literary text collections are analysed with digital tools. Making a corpus with Svetlana Alexievich's

novel *The Unwomanly Face of War* and Muhammad Hanif's novel *Red Birds*, the study pinpoints certain emotions to detect the tone and genre of the selected texts. Both novels are compared to show the number of positive, negative and neutral words with their percentages.

Problem Statement

Social relationships and personalities are comprehended by sentiment analysis; therefore, emotion mining detects the emotional shifts in the text, the characters' interpersonal relations, and the impact of the novelist's own life on the given text. Social circumstances not only influence emotions but also affect a society, life experiences and goals.

Significance Of the Study

This study highlights the emotion words that connote positive and negative sentiments. Technology facilitates the identification of knowledge patterns, and distant readers infer ideas about emotions precisely, sentiments, novelists' attitudes, intents, themes, and the tone of texts. Another advantage of conducting this study is that it presents data visualisation having indelible effects on cognition.

Research Objectives

This study aims to accomplish the following objectives:

- i. To discover knowledge patterns of positive and negative sentiments in *The Unwomanly Face of War* and *Red Birds*.
- ii. To detect six primary emotions of joy, anger, fear, sadness, disgust and surprise from the selected text with the IntenCheck tool.

Research Questions

This study raises the following research questions:

- i. How do both novels *The Unwomanly Face of War* and *Red Birds* manifest knowledge patterns of positive and negative sentiments?
- ii. Where have six primary emotions, joy, anger, fear, sadness, disgust and surprise, been delineated in the selected novels?

Delimitations Of The Study

This research delimits only two war texts: *The Unwomanly Face of War* and *Red Birds*. The current study categorizes six primary emotions: joy, anger, fear, sadness, disgust and surprise.

Literature Review

Feelings and emotions have always been of great interest to many literary scholars. Computational sentiment analysis techniques have been employed to analyse literary texts, plays, movie scripts and novels and track the patterns of sentiments common to the large text.

Sentiment annotation, specifically of sentences in different fairy tales, was analyzed by Sproat and Alm in the year 2005. Then, the emotional distributions were analyzed statistically by applying

the equation $Z = \frac{E_i - E_j}{\sqrt{E'(1 - E')(\frac{2}{n})}}$. Alm and Sproat (2005) worked on fairy tales because child-directed texts manifested emotional distributions; for example, the tale began with a neutral description, and then there was a happy conclusion; therefore, it was analysed with the emotional trajectory of the story. The study used 22 Grimm's fairy tales or 1580 sentences as a dataset and investigated the prominence and prolongation of neutral sentiment in fairy tales. The study conducted text-based emotion prediction to track the pattern of emotional development across the children's stories. The study found that the first part of the fairy tales was the least emotional due to the description of settings, and the last part signified a jubilant ending mainly due to an increase in positive emotion (Alm & Sproat, 2005).

Another work on the sophisticated characteristics of emotional states has been done. Different sentiments like happiness, fear, sadness, surprise and anger were detected in literary

works. Using the emotion mining technique, long-term emotional patterns or trends in different genres were identified (Mohammad & Turney, 2010). In the past few years, much work was done in sentiment analysis, particularly in detecting whether a sentence had a negative, positive or neutral connotation. These literary scholars presented data visualisation to analyse the emotion words in the text. The study used the Brothers Grimm's fairy tales to find emotion patterns in the text of many stories to show better searches. The study used Google Books Corpus to extract emotions. The study compared novels and fairy tales with the use of an emotion lexicon and proved the extensive distribution of emotion word densities in fairy tales (Mohammad & Turney, 2010). Mohammad and Turney used Mechanical Turk to compile an emotion lexicon called EmoLex. The study chose nouns, verbs, adjectives and adverbs, which were used frequently. The study discovered that parts of speech commonly tended to inspire emotions and found that adjectives and adverbs were the most emotion-evoking terms. Moreover, the study focused on the emotions of joy, sadness, anger, fear, disgust, trust, and surprise, as proposed by Plutchik, because the emotions were paired owing to their opposite characteristics (Mohammad & Turney, 2011). The study discussed the dramatic changes that occurred with the development of the plot and the analysis of textual emotions. The study considered three views on emotions for computational analysis: Plutchik's wheel of emotion, Ekman's theory of basic emotions and Russel's Circumplex model. Their research study discussed research papers that used sentiment features for genre classification. Therefore, these literary works expressed different emotions, literary works were classified into story-type clusters or genres. Moreover, these studies aimed to recognise or classify the sentiment and to understand the structural formation. The study took into consideration that linked sentiment analysis with the analysis of the emotionality of characters in any literary narrative (Mohammad, 2011).

The sentiment analysis technique was used to study the plot structure in novels. The study compiled a word-emotion-based lexicon for the elements of the plot of the novel by using the corpus of 19th-century novels. Elsner discussed the emotions and frequency trajectories of characters and their social relationships for the analysis of plot structures (Elsner, 2012). In 2013, Nalisnick and Baird conducted a sentiment analysis of Shakespeare's plays to analyse the characters' interpersonal relationships. The character-to-character analysis aimed to highlight the influential moments in the text structure and narrative. The study analysed Shakespeare's most famous couples, which include Hamlet vs Gertrude, Othello vs Desdemona, Romeo vs Juliet, and Patricio vs Katharina. to present an interpretation that fell in line with the readers' expectations (Nalisnick, & Baird, 2013). In 2015, Khattri and Joshi used historical tweets of the writers to predict sarcasm. The study discovered that the sentiments expressed in the past were used as a context for the detection of sarcasm. Therefore, the study used a contrast-based and historical-based predictor to find whether the sentiment expressed on a particular topic in the target tweet matched the sentiment expressed on the same topic in the past (Khattri & Joshi, 2015).

One of the computational and NLP techniques was sentiment analysis, which helped to extract information like opinions and sentiments conveyed by the novelist. The core purpose was characterising the novelist's attitude on different topics into neutral, positive or negative categories. In 2016, Beigi and Liu further investigated the application of sentiment analysis to business intelligence, marketing, politics, and social media websites like tweets but used for disaster relief. Both studies used three methods, including SentiStrength Topsy, Linguistic Inquiry and Word Count (LIWC) as algorithms for sentiment detection. The first responders used the information posted by social media users to improve situational awareness and crisis management. The polarity of sentiments included panics, fears, concerns, and feelings of the individuals who were tracked for the assistance of authorities regarding decision-making without

spending a budget on public surveys (Beigi & Liu, 2016). In 2018, Schmidt and Burghardt worked on German plays and evaluated the sentiment analysis of Gotthold Ephraim Lessing's plays. The study gathered a corpus of 8,224 speeches for the annotation-based study. The study found SentiWS, a German resource program, as the finest-performing lexicon for their analysis. The study evaluated several parameters like case sensitivity, lemmatisation, elimination of stop words and historical inflections to assess the overall performance of German sentiment lexicons. Based on their results, the study found that accurate performance was accomplished with the SentiWS lexicon extended with historical inflections, lemmatisation and overlooking case sensitivity (Thomas & Manuel, 2020). In 2019, Sirsat, Rao and Wukkadada highlighted the increase in the use of various social platforms where people expressed their views, opinions and sentiments. The study carried out a sentiment analysis on 200 tweets to evaluate a product by employing the Naive Bayes classifier and the TextBlob package to calculate the sentiments of the tweets (SudarshanSirsat, Rao, & Wukkadada, 2019).

Research Methodology

Saunders's research onion was developed in 2012 to guide a successful methodology. According to Saunders, just like peeling the onion, the research process begins from the outer layer and then moves to the inner layer of the research onion Figure 1. Therefore, this study follows the research onion framework, which comprises six steps: Research philosophy, Research approach, Research strategy, Research choice, Research time horizon and Techniques and procedure (Saunders, Lewis, & Thornhill, 2012).

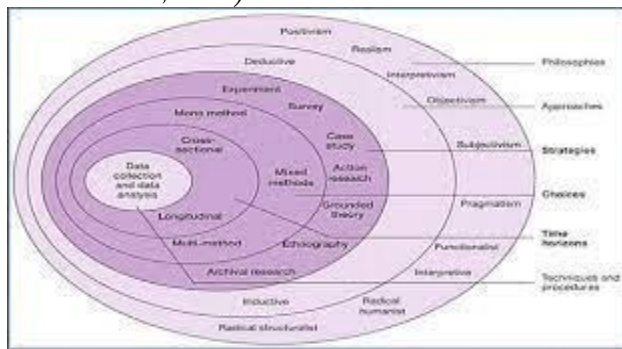


Figure 1. Research Onion

This study is epistemological because it constructs and justifies knowledge while discovering new knowledge patterns. The deductive approach has been used to test the theory and ideas with the support of data. The research strategy concentrates on the experimental method. The research time horizon makes it a cross-sectional study. In research techniques and procedures, the data was collected and analysed through the following procedure.

Data Collection

The novel *The Unwomanly Face of War*, was written by Nobel laureate Svetlana Alexievich in 2015, and the second one is *Red Birds* by an award-winning Pakistani novelist, Mohammad Hanif. *The Unwomanly Face of War* portrays war as insane, repulsive and sickening. In this novel, the novelist interviewed hundreds of Soviet women for seven years, including pilots, cooks, and doctors who bravely fought alongside men. Still, all their sacrifices were forgotten after their success in war. The second novel, *Red Birds*, is about the war on terror led by the U.S.A. The Nomad family was forced to be confined to a forlorn camp to the ends of the earth. The grounds behind this data selection are to categorise emotions present in the war text. The purpose is to analyse how different novelists depict the concept of war.

Research Method

Firstly, the corpus is built to analyse the text's war themes, tone and genre. In the second step, the data are uploaded on the digital tool named IntenCheck. This digital tool is a lexicon-based sentiment engine. It helps the users to identify how the novelist uses different words. Different scales, such as positive-negative, strong-weak and active-passive, are explored by IntenCheck (Intentex team, 2019). This tool detects six emotions: joy, anger, fear, sadness, disgust, and surprise, as identified in Paul Ekman's theory of emotion (2008). This tool points out six primary emotions separately; for example, the words that expressed joy were viewed by selecting 'the joy category'; similarly, other categories were visible to the user with just one click. Thirdly, it would generate a text analysis report and visualise the highlighted word data. After the final visualisation, the study analysed the text based on knowledge patterns generated by IntenCheck tool.

Theoretical Framework

The data generated by the IntenCheck tool provides a new path of knowledge yet to be explored. With the passage of time, the amount of data has grown larger than the terabyte size, and therefore, it became impossible to maintain it manually. As a result, many software tools are developed to gain the underlying insight of the text effectively. The research theory for this purpose is the Knowledge Discovery Theory. The study has applied the Knowledge discovery theory in Databases (KDD), which was introduced in 1989. The ultimate goal of this theory is to analyse thousands of books effectively. The purpose is to extract useful knowledge from unstructured data. The rationale behind this theory is to find valuable patterns of knowledge. The interdisciplinary nature of KDD is evident from the fact that it has been developed from the intersection of other research domains like databases, data mining, machine learning and data visualisation. Therefore, KDD was declared as a "nontrivial process of identifying valid, novel, potentially useful, and ultimately understandable patterns in data" (Fayyad, Piatetsky, Smyth, & Uthurusamy, February 1996). In the KDD process, the first step is to understand the relevant knowledge and its domain. The second step is to create a specific target for the corpus. The third step involves processing and cleaning data after removing irrelevant data. The fourth one is to find the target feature, subject to the ultimate goal of the study. The fifth one is data mining, which includes regression, summarisation, clustering, classification, etc. Fayyad, Piatetsky-Shapiro, and Smyth (1996) described these data mining methods.

Research Design

The Research choice for the present study is a mixed-method approach. It is a "third methodological movement" which is only now beginning to mature "as a well-established methodological alternative with agreed-on foundations, design, and practices" (Tashakkori & Teddlie, 2010, p. 287). A mixed methods approach has been applied because the research design encompasses qualitative and quantitative research approaches. The meaning was added to numeric data with narrative and visual information. In contrast, a high level of precision was added to the narrative and non-textual information with numeric data. Qualitative research design is valuable in discovering knowledge from raw data and exploring the emotions expressed by the novelist. Quantitative data help to represent the numerical count of positive, negative, and neutral sentiments as categorised by IntenCheck.

Data Analysis

The selected data are analysed with IntenCheck tool, which scales from 0 to 100. Then it is further divided into five gradations. The value 0-5 shows that the grade is 'very low,' i.e. low probability of that particular category. The value 6-20 shows that the grade is 'low,' i.e. low probability of that certain category. The value 21-80 shows that the grade is 'normal,' i.e. within the language norm.

The value 81-95 shows that the grade is 'high,' i.e. relatively high frequency of words. The value 96-100 shows that the grade is 'very high,' i.e. statistically significant.

Positive And Negative Sentiments In Both Novels

The knowledge patterns of positive and negative sentiments have been derived in the following section:

POSITIVE SENTIMENTS IN RED BIRDS

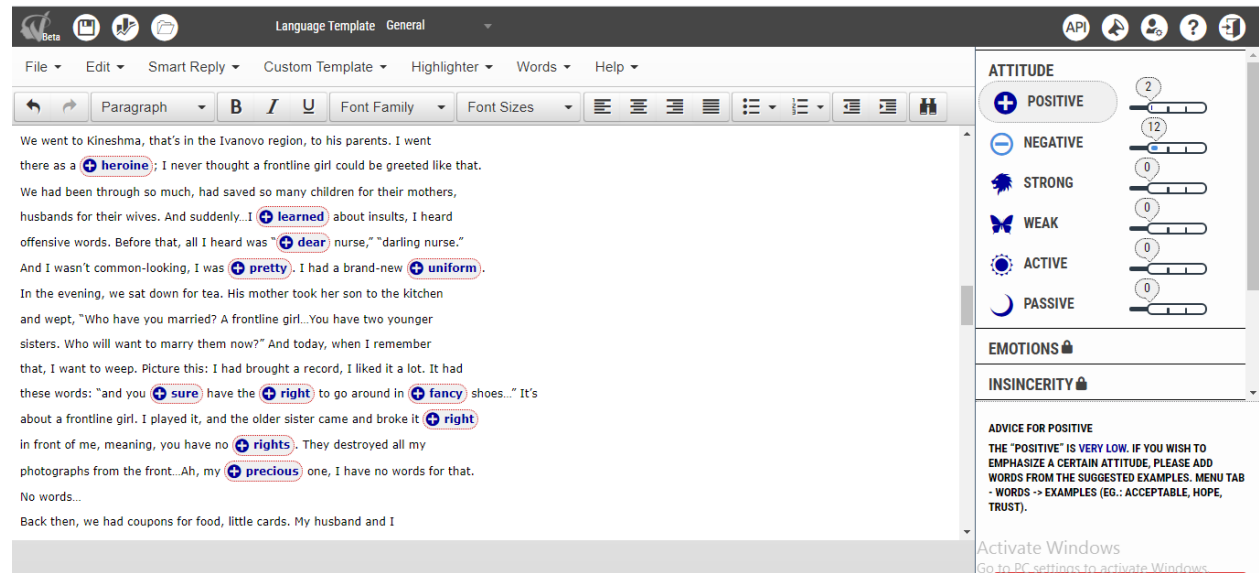


Figure 2. Positive Sentiments in Red Birds

In the novel Red Birds, Figure 2 words present positive sentiments, which are low because this novel represents a war-affected society. The novelist has used some positive words like 'better', 'hope', 'heart', 'dear', 'eventful', 'fine', and 'hope' that depict positive sentiments in the text. The character, Momo, is somehow an optimistic individual who thinks his missing brother is in a good place and surely will return one day. Furthermore, another leading character, Mother Dear's optimism exposes life in refugee camps. Though they are emotionally shattered and physically exhausted, yet a ray of hope lurks in those lands.

NEGATIVE SENTIMENTS IN RED BIRDS

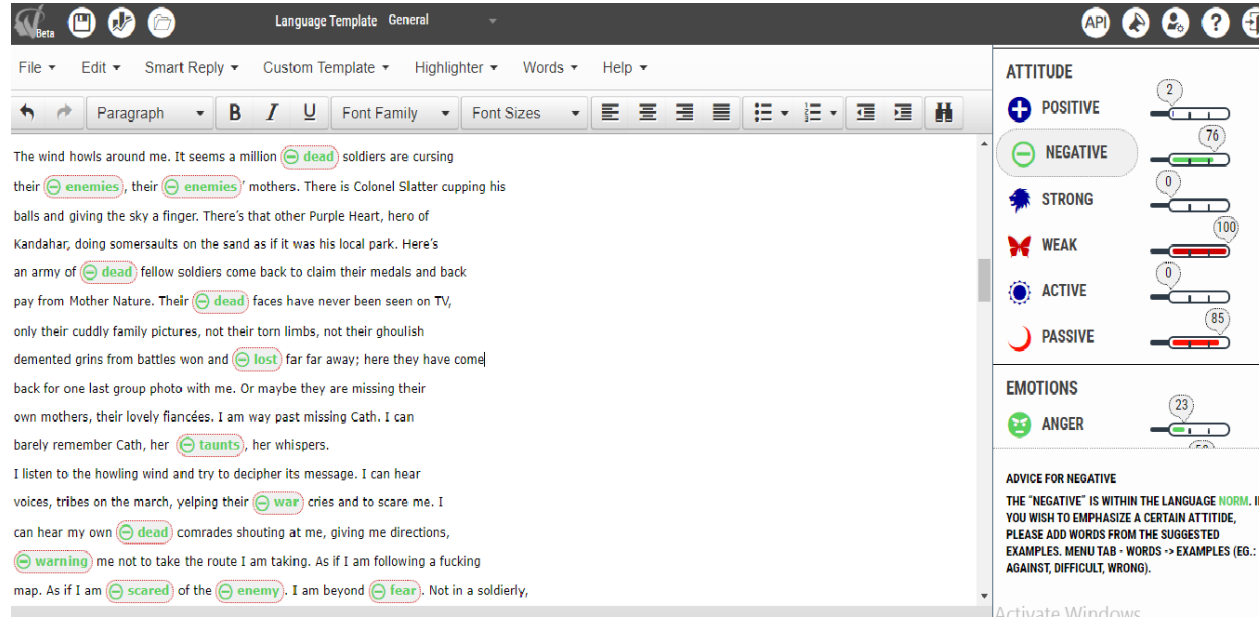


Figure 3. Negative Sentiments in Red Birds

Figure 3 shows that Muhammad Hanif portrays the negative sentiments in the novel. Emotion mining of the text reveals negative sentiments which are highlighted words. This digital tool precisely quantifies the negative words from any text. The novelist has used these words: 'dead', 'enemies', 'war', 'lost', 'battles', 'warning', 'fear', 'scared' and 'taunts' that convey negative sentiments. The word 'war' itself connotes some sort of threat, hostility and bitterness that arouses negative sentiments among the readers. It gives an insight to the audience that war is horrible and produces the worst effects. The novelist repeatedly uses words like 'warning' and 'scared', to disseminate the sense of tension among the readers. 'Death' connotes sadness, grief, loss, tears and pain that reflect an emotional state of mind, as mentioned by D emuthova in her article "The Most Frequent Connotations of the Concept of Death in Young Adults" (Demuthova, 2012). These negative sentiments considerably affect the audience, such as physical manifestations like goosebumps. Furthermore, it shows that the novelist sets a gloomy tone from the beginning of the novel. The three most important narrators Ellie (US fighter plane pilot), Momo (15-year-old kid), and Mutt dog (which sees Red Birds and senses the deepest of emotions), take the audience to the pretentious world politics in order to ponder over the lives whom the war has destroyed. Mohammad Hanif keenly assesses the abominable cruelty of the United Nations and America in destroying weaker opponents. This predicament is prevalent through his use of words associated with negative attunement. From the beginning, the novelist has frequently used the word 'enemies', that we bomb the people living in the refugee camp because they are alleged terrorists or potential threats to their country. However, the novelist uses the word 'enemies' in a satirical way to emphasise that the real enemies are those who bombed in the first place. One leads one's life miserably when injustice is inflicted upon him.

POSITIVE WORDS IN THE UNWOMANLY FACE OF WAR

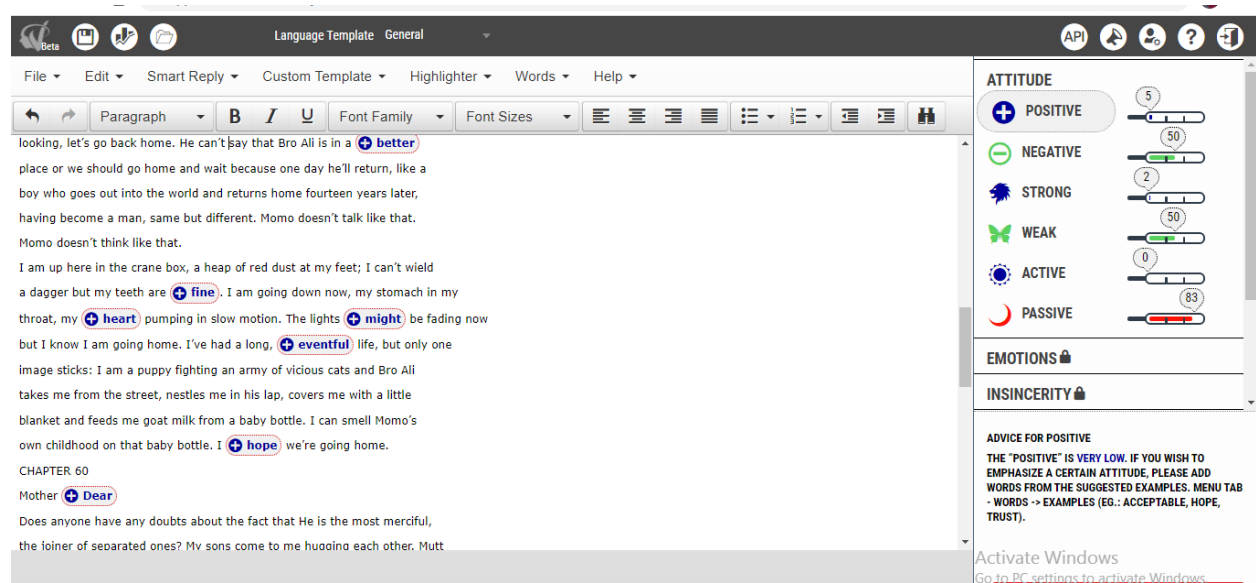


Figure 4. Positive Sentiments in The Unwomanly Face of War

According to Figure 4, the intensity of positive words is relatively low compared to the negative ones. As highlighted in the figure, words like 'dear', 'pretty', 'precious', 'fancy', and 'heroine' convey positive sentiments within the text. Overall, the setting and mood of this novel are gloomy, so the use of words bearing positive sentiments is relatively low. It is observed that the value of positive words is '2' while negative is six times more than the positive ones. The novel is about war, and the novelist's tone is melancholic and lugubrious, which shows sadness and injustice. The interviewees in the novel express sad feelings because some were scared about the future, some

were trying to make peace with the past, and some were thinking about the futility of their efforts. So, the novelist's choice of diction makes the tone quite depressing and despairing.

NEGATIVE SENTIMENTS IN THE UNWOMANLY FACE OF WAR

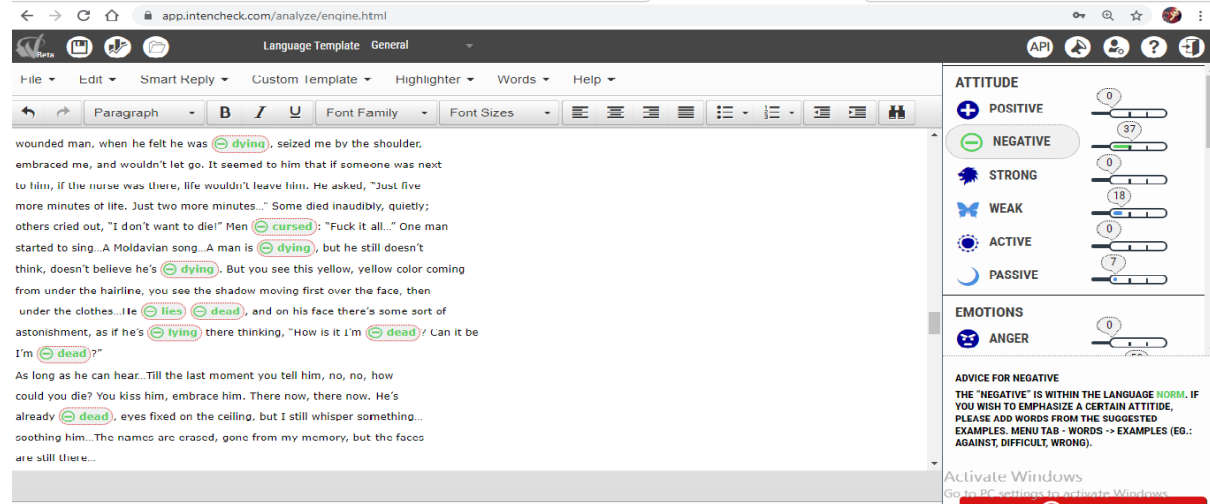


Figure 5. Negative Sentiments in The Unwomanly Face of War

Figure 5 shows how Svetlana Alexievich expressed negative sentiments at the beginning of the novel. The present study deals with the emotion mining of the text and the extraction of words that mainly convey the novelist's negative sentiments. All the words that attune negative sentiments are underlined in Figure 5. The software IntenCheck accurately quantifies the negative sentiments expressed in a particular excerpt. The novelist uses words like 'killed', 'dying', 'cursed', 'dead', and 'lies', conveying negative sentiments. The novelist uses 'dead' 83 times in the novel, which shows that female soldiers faced brutality and their lives underwent suffering, chaos and trauma of the war. As a society never accepts or acknowledges their courage, the negative sentiments show the atrocities during and after the war.

Women in all fields of life, like doctors, engineers, truck drivers, cooks, fighter pilots, snipers, and laundry workers, took part in the war. In this novel, an oral history of Soviet women, the word 'die' is used 81 times. They not only took part in the war but also faced agonizing deaths of their loved ones like husbands, children and parents. War has transformed every green field into red-stained blood patches. The word 'killed' has been used 126 times in this novel which shows how sickening the war is. In addition, the word "shoot" has been used almost 62 times in this novel. It shows the terrible and exceedingly horrendous things like the bombing in a populated area, tragic injuries and bullets in the air etc. are part of the daily routine of those people. So, the use of these emotion-bearing words creates an intimacy between the audience and women in the war, showing that women have suffered a lot in this game of victimisation. So, according to the statistical occurrences, the weightage of negative sentiments in The Unwomanly Face of War is higher in comparison to Red Birds. The words that construct the positive sentiments are, to some extent, more in Red Birds than in The Unwomanly Face of War. Both novelists write with strong emotions to persuade the audience how dehumanising and bitter war leads to endless suffering, miseries and lifetime torture. It is a waste of young people's lives and the destruction of their future goals and hopes.

Appraisal of Ekman's Six Primary Emotions

This section of the current study tracks six of Ekman's primary emotions; anger, sadness, fear, disgust, surprise and joy.

A. ANGER WORDS IN RED BIRDS

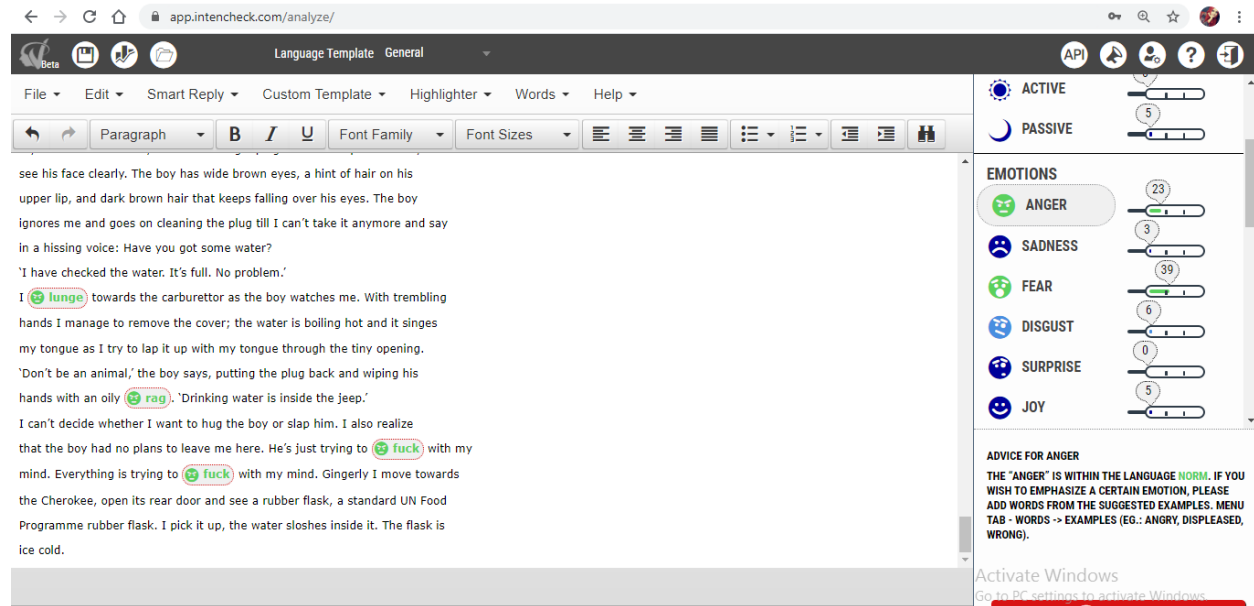


Figure 6. Anger Words in Red Birds

In this passage, the novelist uses many anger-bearing words (Figure 6) to intensify the sensitivity of the situation. The novelist has used the words like 'fucked' and 'motherfuckers' more than 50 times in *Red Birds*. Though these words are abusive, they show frustration and displeasure at the after-effects of war. As unbridled frustration unleashes, an annoying attitude is expressed by several vile words like 'rage', 'irritation', 'exasperation', 'displeasure' and 'aggressive'. These vocabulary items are persuasive throughout the novel, which shows disagreement towards U.S. foreign policy. The novelist's choice of vocabulary alludes to the fact that the US foreign policy had frustrated them.

The novelist conveys the incensed tone with the use of harsh and aggressive words to portray how vulnerable the event of war is. War is like a curse for the oppressed people. The sole reason for fury is that the feelings of prejudice and biases govern and determine the fate of the whole community. Anger flames are visible through the character of Mother Dear because she has a strong desire to get her son back. She shows an aggressive attitude towards Lady Flowerbody, who is the UN representative, that at first, they bomb their house, then take their son, fill their life with hatred, violence, and aggression, and later make them feel all right to cure PTSD (post-traumatic stress disorder). It establishes an eerie atmosphere, and Bro Ali's family is immobilised owing to fury. The extracted information is used to deduce the genre of war literature.

A. ANGER WORDS IN THE UNWOMANLY FACE OF War

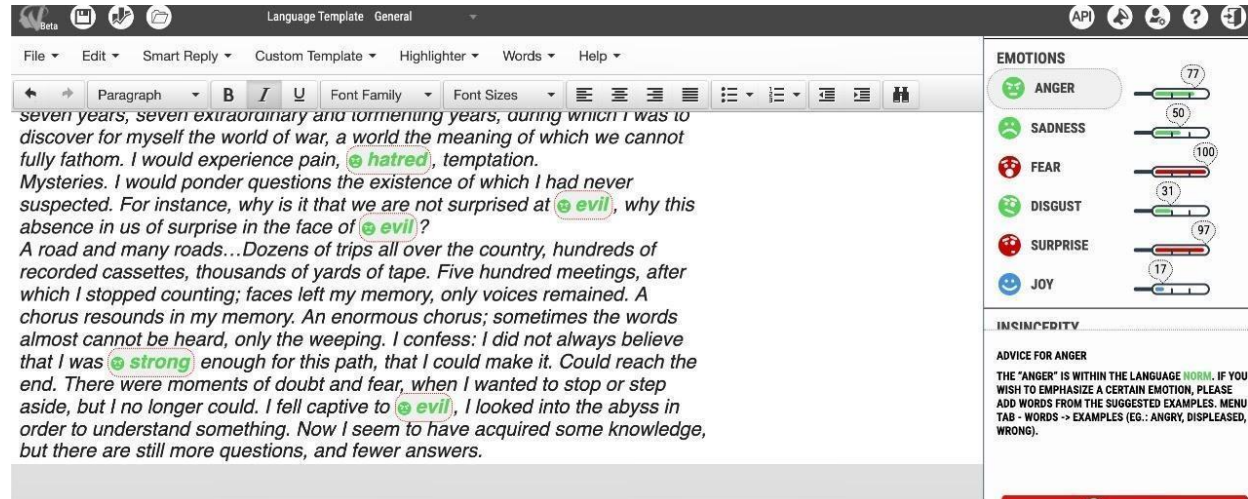


Figure 7. Anger Words in The Unwomanly Face of War

The novelist has used several words that emphasise the emotion of anger, which is aggravated by the devastation of war. Even after the war, the women feel angry because of painful happenings during the past military endeavours, such as injuries, loss of loved ones, combat, and physical and sexual abuse. Due to traumatic events, the young girls are constantly in a state of hypervigilance with exaggerated fear and anxiety. While narrating the past tragic events, the novelist expresses aggression to express their inner feelings about the past, which was full of suffering and disastrous circumstances. An intense emotional state is prompted due to the use of such diction. The interviewees use words such as 'enemies' seventeen times, showing the level of indignation against abuse and ill-treatment. Other words include 'hatred', 'evil', 'vexed', 'mad', 'ill', 'resented', and 'pitied', which implies anger.

Comparing both novels, the number of anger-bearing words in The Unwomanly Face of War is more than that of Red Birds.

B. SADNESS IN RED BIRDS

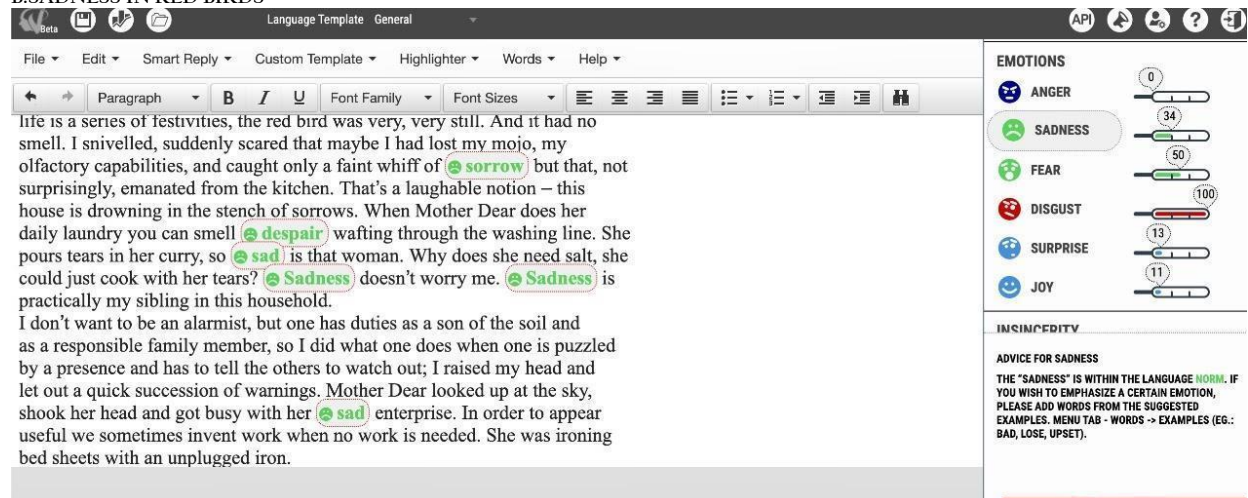


Figure 8. Sadness in Red Birds

In Figure 8, the results of the IntenCheck tool show that the words depicting disgust are more than those depicting sadness. Words such as 'sorrow', 'despair', 'sadness', 'cry', and 'tears' express the sad emotions most characters feel too often. In this excerpt from Red Birds, the ratio of words with sad feelings is less than fear words. The value of sadness is 34; fear is 50; disgust is 100; anger is 0; joy is 11, and surprise is 13. One of the lead characters, Mother Dear, feels utter sadness about

people's conditions while living on the borders of superpower countries. More specifically, the homelessness and displacement of Bro Ali sadden her immensely. Most of the sad narrations are uttered by Mutt, and every night Momo waits for his Mother Dear, to take an interval from crying. B.SADNESS IN THE UNWOMANLY FACE OF WAR

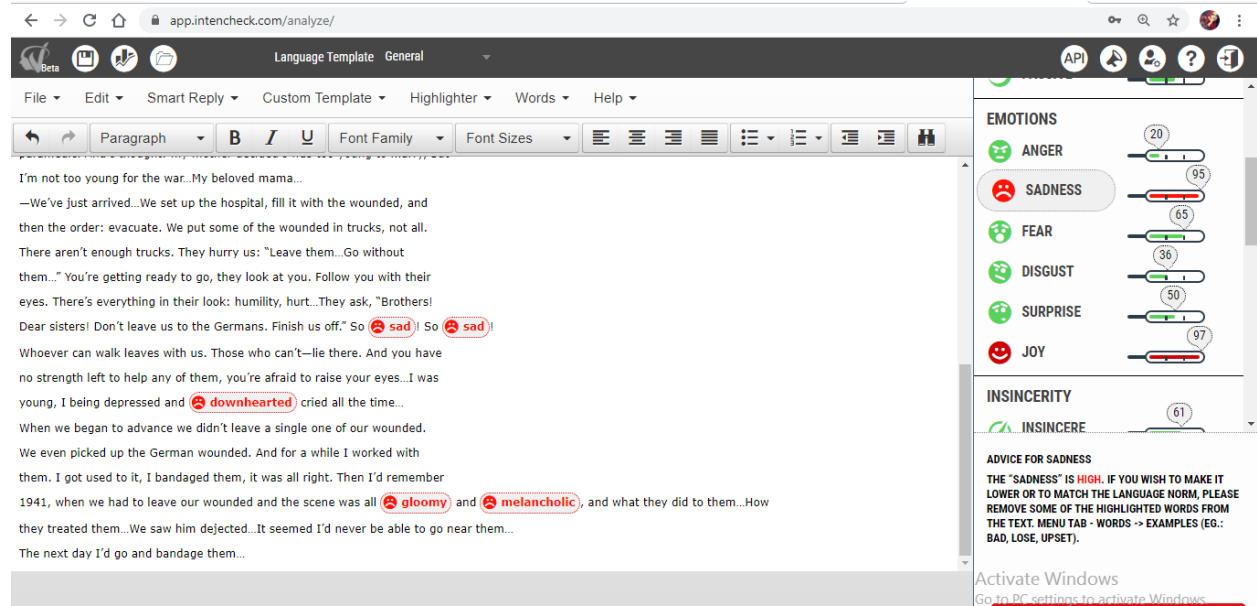


Figure 9. Sadness in The Unwomanly Face of War

As highlighted in Figure 9, the novelist has used a plethora of words to express a strong emotion of sadness. The results regarding diction show that sadness is 95, fear is 65, surprise is 50, disgust is 36, and anger is 20. The diction reveals sadness, setting the tone of the literary work. Some of the most common sad words include: 'gloomy', 'melancholic', 'downhearted', 'sad', 'cried', 'depressed' etc. These words reflect the genre of the text, and thereby explicitly narrate the ghastliness of the phenomenon of war. All women have narrated the incidents that a reader is left with repercussions and reverberations. The introduction of Svetlana Alexievich at the beginning of the novel heralds the despairing, sullen, and realistic situation of war. The novelist aptly reveals the unheard stories of the women to immortalise their voices with palpable sad emotions.

C. FEAR WORDS IN RED BIRDS

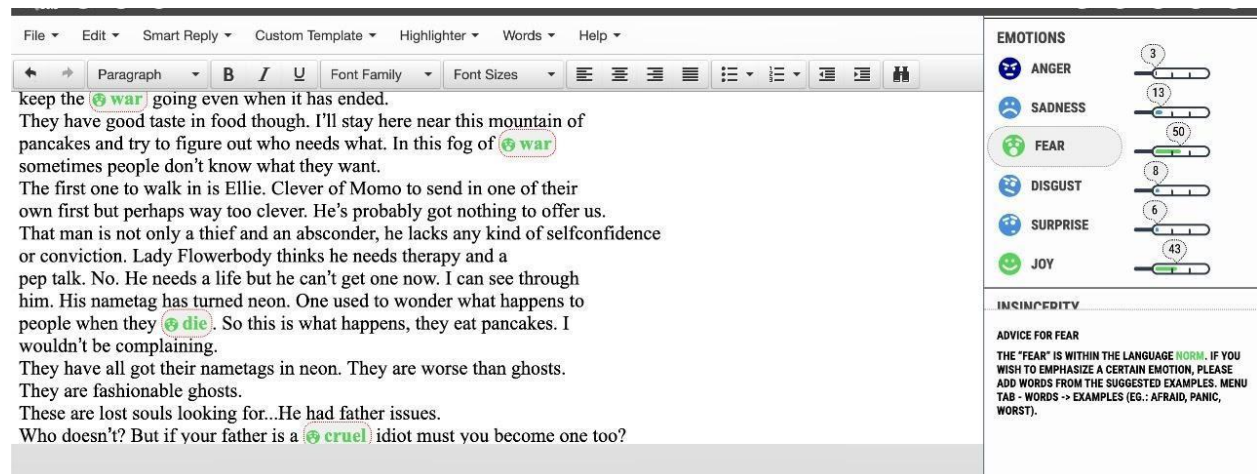


Figure 10. Fear Words in Red Birds

The number of fear words in this excerpt exceeds the other primary emotions. Words such as 'war', 'die', 'cruel', and 'panic' are the seed words for the fear category. The emotional intensity

helps to recognise the novelist's vocabulary choices that reflect characters' emotions. Through these words, Muhammad Hanif expresses his emotions explicitly, and the reader easily identifies unambiguous terms. So, the results show that the number of fear-bearing words in Red Birds is more than in The Unwomanly Face of War.

C. FEAR WORDS IN THE UNWOMANLY FACE OF WAR

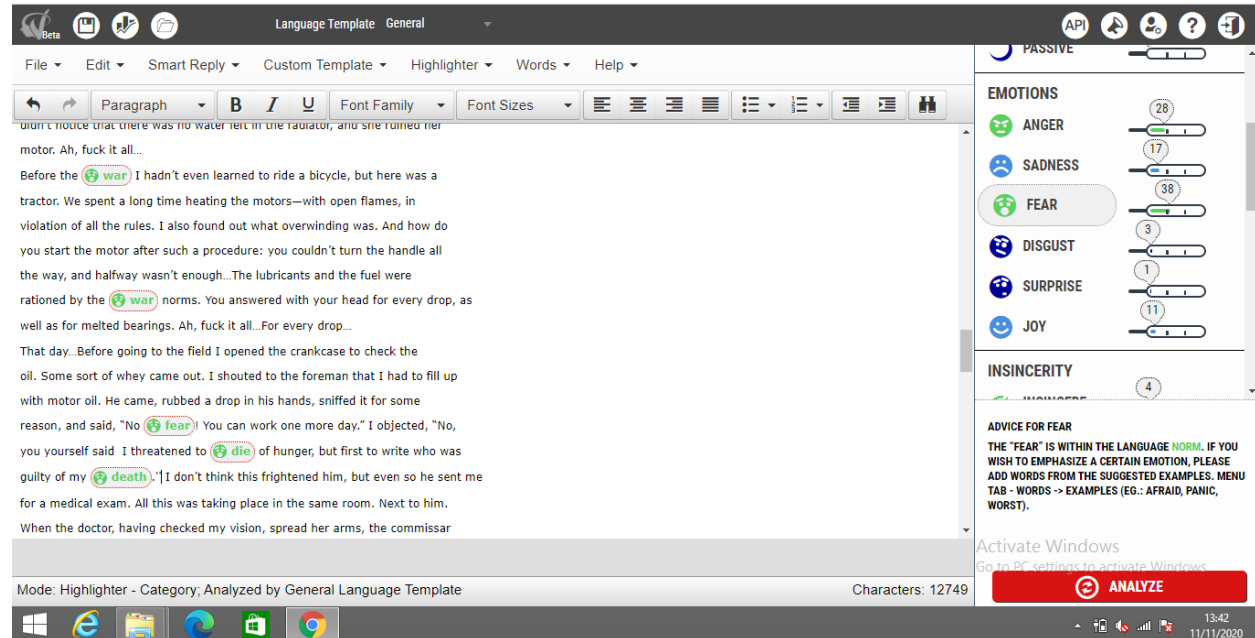


Figure 11. Fear Words in The Unwomanly Face of War

As depicted in Figure 11, the numerical weightage of the fear emotion is much more than other emotive words. The selected text is a collection of interviews from the novel, The Unwomanly Face of War. In the selected data, the value of fear is 38, anger is 28, sadness is 17, joy is 11, disgust is 3, and surprise is 1. Considering the fear emotion, the words include 'war', 'fear', 'die', 'terrible', 'panic', 'horror', 'frightening', 'frightful', 'agitation', 'dreadful' and 'terror'. These words induce threat or danger that makes people feel the nagging pain and distress towards the disastrous events of the war. War is never great; rather, it perfectly depicts barbarism and ghastliness. Every woman who was somehow part of the war experienced post-traumatic stress disorder (PTSD), particularly nightmares. The aftermath of the war was immensely negative, and every woman narrated the disturbing thoughts, dreams and fear of the post-war that resulted from their exposure to the traumatic happenings.

D.DISGUST WORDS IN RED BIRDS

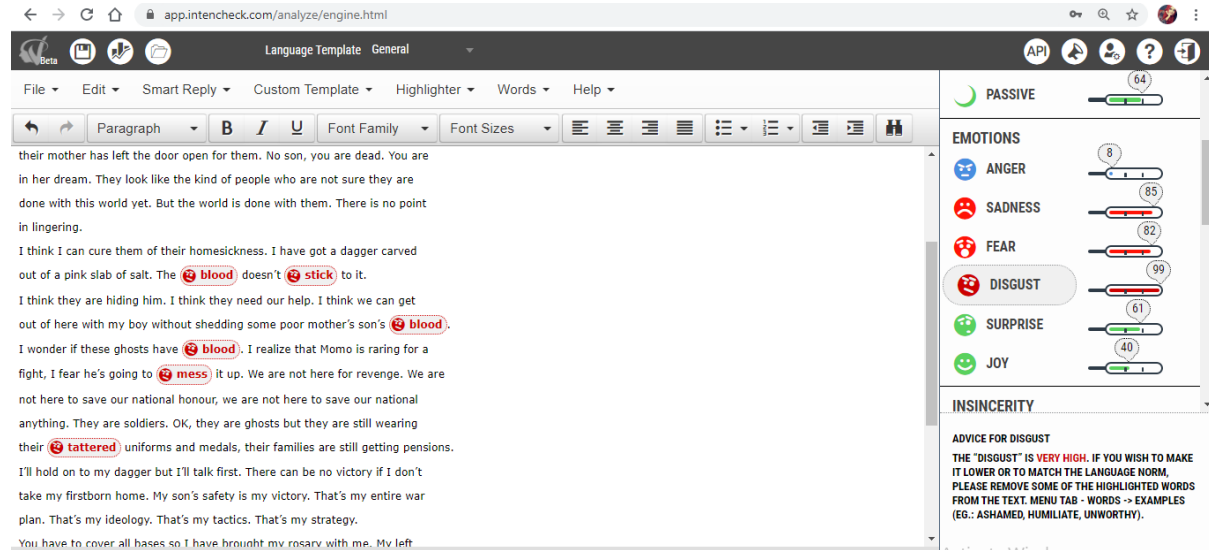


Figure 12. Disgust Words in Red Birds

Figure 12 represents certain emotion words; the value of disgust words is more than other primary emotions. Data have been collected, including 2100 words from three of the chapters of Red Birds. The software IntenCheck categorises all of the six primary emotions, which show that the value of disgust emotions is 99, fear is 82, sadness is 85, surprise is 61, anger is 8, and joy is 40. The words such as 'blood', 'stick', 'mess', 'tattered', 'sick', 'sickening', 'nauseating', 'nausea', 'repulsive', and 'smelly' manifest the emotion of disgust. Subsequently, the use of such words in Red Birds shows that the family of Bro Ali is disgusted by immoral acts and dominating foreign policy.

D.DISGUST IN THE UNWOMANLY FACE OF WAR

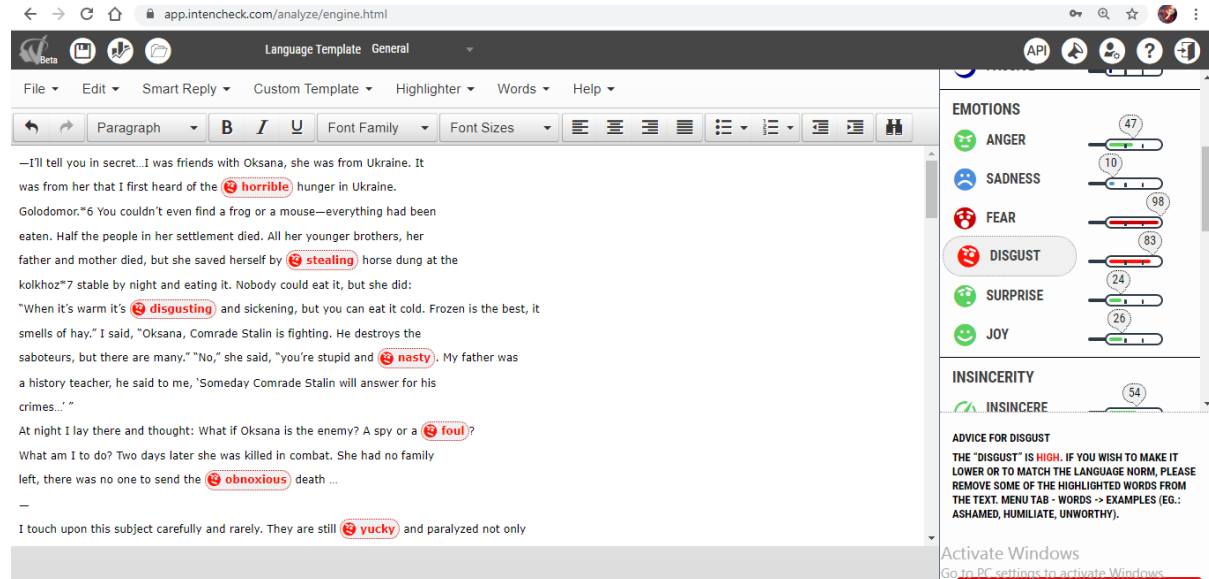


Figure 13. Disgust in The Unwomanly Face of War

Considering Figure 13, which highlights primary emotions in The Unwomanly Face of War, the words that express the emotion of disgust are less than other emotive words. The selected data consists of recorded interviews in The Unwomanly Face of War. According to extracted emotions, the value of fear is 98, disgust is 83, anger is 47, joy is 26, surprise is 24, and sadness is

10. Words such as 'horrible', 'stealing', 'disgusting', 'nasty', 'yucky', 'obnoxious', 'repulsive', and 'foul' inspire emotion of disgust among the audience. Svetlana Alexievich's diction is an expressive tool that effectively conveys a sense of offensiveness and disapproval towards violence. The intensity of disgust is higher in Red Birds, while it is relatively low in The Unwomanly Face of War.

E.SURPRISE IN RED BIRDS

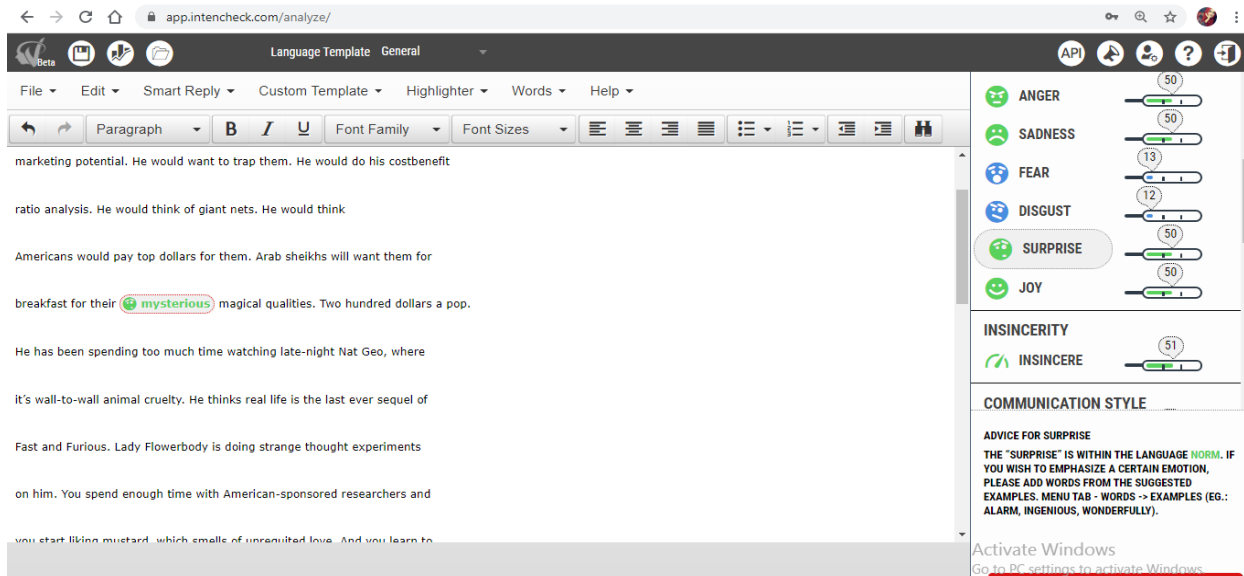


Figure 14. Surprise in Red Birds

The value of words explicitly stating the emotion of surprise is 50 in Red Birds. Moreover, the use of these words depicts a sense of shock and disappointment. The words show that the characters are offended and shocked by American role in the destruction of Middle East countries.

E.SURPRISE IN THE UNWOMANLY FACE OF WAR

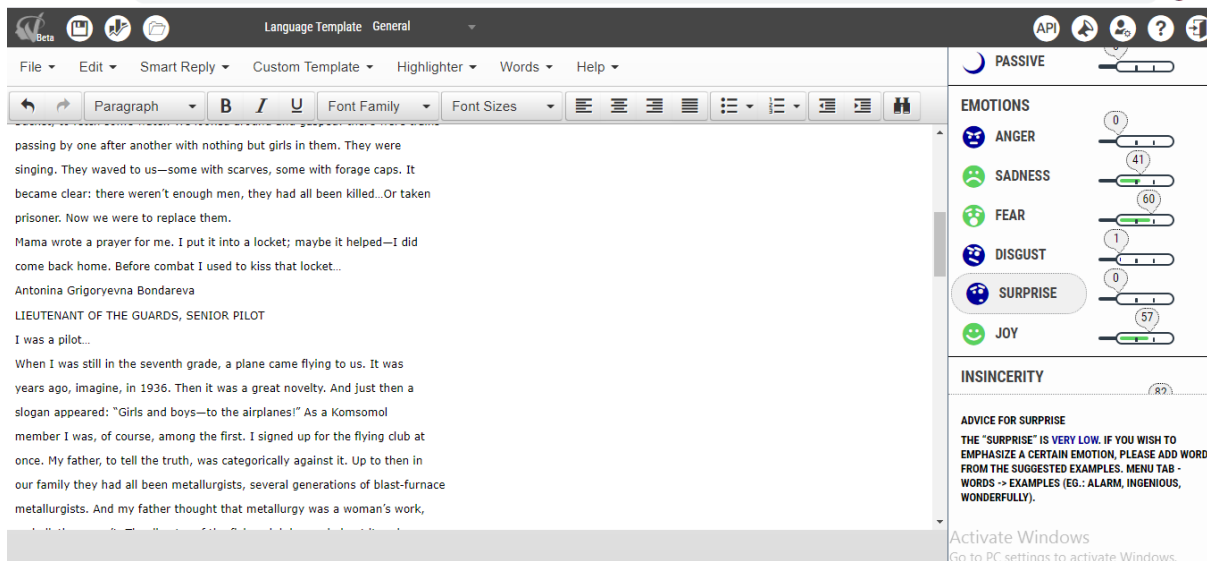


Figure 15. Surprise in The Unwomanly Face of War

Considering the other novel, the value of words expressing surprise is 0, which is comparatively low. The use of words intended to convey the emotion of surprise is relatively low in both of the selected texts.

F. JOY WORDS IN RED BIRDS

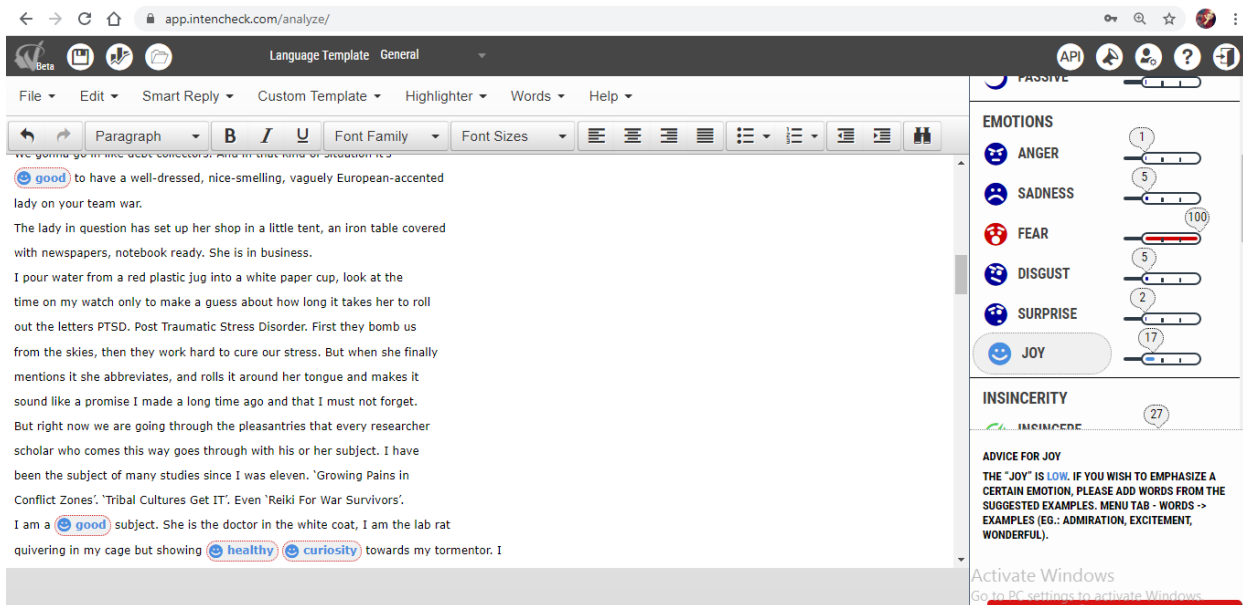


Figure 16. Joy Words in Red Birds

Figure 16 reveals that the emotion of joy is considerably less than fear's. The value of the words that express fear is 100; joy is 17, disgust is 5, sadness is 5, surprise is 2, and anger is 1. The words such as 'good' are used almost 96 times in the whole novel; other words like 'healthy', 'laughter', 'happiness', 'fun', 'sarcastic', 'funny' and 'exultation' depict the emotion of joy within the text. The narrator's dog, Mutt, converses about the past time when the whole family lived together happily. As he says, "There was a freak monsoon, peacocks flashed their amber wings and did their ridiculous dance, big, fat, grey electric transformers sat on pylons like big, fat omens. And everyone was happy" (Hanif, 2018). The novelist uses these joyous words when he remembers the past nostalgic moments before the series of tragic events. The novel Red Bird is a tragic war-related satire that shows how people have excuses for war and collateral damage.

F. JOY WORDS IN THE UNWOMANLY FACE OF WAR

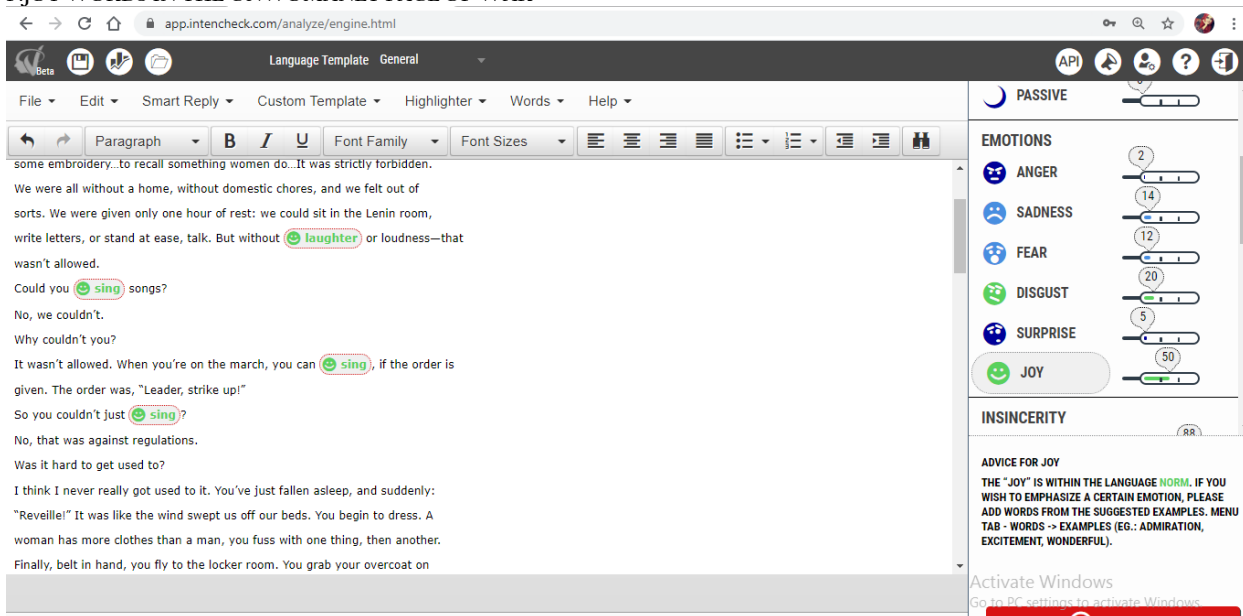


Figure 17. Joy Words in The Unwomanly Face of War

Figure 17 shows that the weightage of joyous words is more than that of other emotive words. The value is as follows: joy is 50, disgust is 20, sadness is 14, fear is 12, surprise is 5, and anger is 2. The words that show the emotion of joy include 'laughter', 'sing' and 'bride' etc. In this novel, more than 200 young women retold some war episodes describing how the young girls dreamed of becoming brides but became patriotic soldiers. As in the following lines, they speak wholeheartedly, remembering how happy girls, mothers, wives, and girlfriends were before the war. "We were so happy; we had made grandiose plans: who would study where to become what. And suddenly—war!" and "Those were happy years. The happiest. My life has become a continuous struggle with illnesses" (Alexievich, 2017).

Conclusion

As a significant finding, the study brings forward the knowledge patterns identified in *Red Birds* and *The Unwomanly Face of War*. Based on statistical occurrence, it discovers the presence of all the emotion-bearing words in two war texts. With emotion mining, the reader easily understands the novelist's intended meaning without thoroughly reading the text. According to the findings, it is observed that the most frequently used words display the emotion of anger, sadness, fear and disgust. On the contrary, there is the least occurrence of words showing the emotion of joy and surprise in both novels. Regarding the comparative emotion mining study of the two novels, the word 'dead' expresses sadness, which is used 58 times in *Red Birds* by Muhammad Hanif and 83 times in *The Unwomanly Face of War* by Svetlana Alexievich. The root word 'kill' is used 31 times in *Red Birds* and 126 times in *The Unwomanly Face of War*. The word 'cry' has been used 73 times in *The Unwomanly Face of War*, but it is used 17 times in *Red Birds*. The word 'death' has been used 27 times in *Red Birds* and 86 times in *The Unwomanly Face of War*. The words 'death' and 'dead' connote despair, sickness, suffering, hopelessness and a coffin. The word 'kill' states senseless murder, assassination, violation and onslaught. As 'cry' refers to sobs, screams, shouts, tears and mourning, which shows that the theme of war runs throughout the novels. However, the intensity of sadness is much greater in *The Unwomanly Face of War* than in *Red Birds*. *The Unwomanly Face of War* is all about the negative effects of war, horror, hellish nightmares, incredible feats, horrendous and unspeakable memories. On the other hand, *Red Birds* by Muhammad Hanif who keenly assesses the US foreign policy and criticises the business of war. Hanif has penned down a tragedy glazed with humour and comical aspects. Regarding the sentiments of both novels, the novelist uses words that express negative sentiments while the use of positive words is too less. Therefore, these words set the tone of both novels, which is gloomy, dark and dim. The word 'war' is associated with the emotion of fear, sadness and disgust that reflects the theme of war. Furthermore, the word 'war' has been used 69 times in *Red Birds* and 662 times in *The Unwomanly Face of War*.

It shows how strongly people hated war and portrayed it as devastating and cataclysmic. Consequently, these highlighted words enable the user to identify the war genre. Using *IntenCheck*, different stylistic features of any literary piece are analysed successfully. Highlighting different emotions used within the voluminous text is time-consuming. Similarly, identifying positive and negative sentiments and all six primary emotions like joy, fear, disgust, sadness, surprise and anger from the large text needs a lot of time and attention. Moreover, assigning statistical weightage to each emotion-bearing word is quite difficult. When someone analyses the text manually, it increases the chances of human error, so to evaluate the given text systematically and accurately, this tool facilitates the user to generate the desired results in a few seconds. It allows the users to converse with exact precision and clarity. It also helps the users to understand the sentiments of the language. As far as academic implications are concerned, emotion mining studies facilitate the learners in the analysis of the text, identification of theme,

comparison and prediction of communication style, as well as the inclination of the novelists. This study recommends the application of emotion-mining techniques to be applied in the field of business intelligence and politicians' political speeches.

References

- Alexievich, S. (2017). *The Unwomanly Face of War*. UK: Penguin.
- Alm, C. O., & Sproat, R. (2005). Emotional sequencing and development in fairy tales. *Affective Computing and Intelligent Interaction*, pp. 668–674.
- Beigi, G., Xia, HuRoss, Maciejewski, & Liu, H. (2016). An Overview of Sentiment Analysis in Social Media and Its Applications in Disaster Relief. *Sentiment Analysis and Ontology Engineering. Studies in Computational Intelligence*, 313-340.
- Demuthova, S. (June 2012). The Most Frequent Connotations of the Concept of Death in Young Adults. *Ostium*, 1 – 11.
- Elsner, M. (2012). Character-based Kernels for Novelistic Plot Structure. *Proceedings of the 13th Conference of the European Chapter of the Association for Computational Linguistics*, pp. 634–644.
- Fayyad, U., Piatetsky Shapiro, G., Smyth, P., & Uthurusamy, R. (February 1996). *Advances in knowledge discovery and data mining*. CAUnited States: American Association for Artificial Intelligence.
- Hanif, M. (2018). *Red Birds*. London, Oxford, New York: Bloomsbury Publishing.
- Intentex team. (2019). *IntenCheck*. <http://intentex.com/?i=1>. Retrieved March 2, 2020, from <https://intentex.com/?i=1>
- Khatti, A., Joshi, A., Bhattacharyya, P., Carma, &, & M. (2015). Your sentiment precedes you: Using an author's historical tweets to predict sarcasm. *Proceedings of the 6th Workshop on Computational Approaches to Subjectivity, Sentiment and Social Media Analysis*, 25–30.
- Mohammad, S. (2011). From Once Upon a Time to Happily Ever After: Tracking Emotions in Novels and Fairy Tales. *LaTeCH '11: Proceedings of the 5th ACL-HLT Workshop on Language Technology for Cultural Heritage, Social Sciences, and Humanities*, pp. 105–114.
- Mohammad, S. M., & Turney, P. D. (2011). Crowdsourcing a Word–Emotion Association Lexicon. *Computational Intelligence*, Volume 59.
- Mohammad, S. M., & Turney, P. D. (June 2010). Emotions evoked by common words and phrases: Using mechanical Turk to create an emotion lexicon. *Proceedings of the NAACL HLT 2010 Workshop on Computational Approaches to Analysis and Generation of Emotion in Text*, pp. 26–34.
- Nalisnick, E. T., & Baird, H. S. (2013). Character-to-character sentiment analysis in Shakespeare's plays. *ACL Anthology*, pp. 479–483.
- Paul, E. (2008). An argument for basic emotions. *Cognition and emotion*, pp. 169–200.
- Saunders, M., Lewis, P. & Thornhill, A. (2012). "Research Methods for Business Students" 6th edition, Pearson Education Limited
- SudarshanSirsat, P., Rao, D., & Wukkadada, D. (2019). Sentiment Analysis on Twitter Data for product evaluation. *IOSR Journal of Engineering (IOSRJEN)*, 22-25.
- Tashakkori, A., & Teddlie, C. (2010). *SAGE Handbook of Mixed Methods in Social & Behavioral Research*. Inc: SAGE Publications.
- Thomas, S., & Manuel, B. (2018). An Evaluation of Lexicon-based Sentiment Analysis Techniques for the Plays of Gotthold Ephraim Lessing. *Computational Linguistics for Cultural Heritage, Social Sciences, Humanities and Literature*.