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Adab Al-Rafidayn Journal

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Editor-in-chief

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FOREIGN RESEARCHES

A Sentiment Analysis of Adverbs and Adjectives

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Abstract

The current paper presents a sentiment analysis that has been employed to analyst opinions, emotions, evaluations, subjective, objective and appraisal at sentence-level into positive or negative opinion by using NLP (Natural Language Processing). It deals with identifying the intensity of adverbs, adjectives, or AAC (Adverb-Adjective Combination). It hypothesizes a score of +1 is positive and +2 or more is (strongly positive) and more than -1 is (maximally negative) whereas a score of 0.0 denotes that the adverb, adjective or overall sentence is (neutral). Furthermore, it clarifies the major procedures of SA including the computational methods "variable scoring" algorithm, "Sentiment Analysis 2.0.0", and "MonkeyLearn Sentiment Analyzer". It discusses two models of sentiment analysis "Dobrescu, 2011" which investigates the main concepts of SA. The second model is "Appraisal Lexicons" which has been utilized to extract "appraisal expressions" as well as "appraisal groups" based on "Appraisal Theory". After data analysis has been collected accurately, the researchers have conducted that the most significant conclusions represent that intensifying adverbs alone are not sentiment-laden. However, adverbs strengthen the semantic conveyed by adjectives. In addition, the researchers have found that adjectives are stronger than adverbs in sentimental analysis. The terms "force" and "focus" are very important in classifying appraisal lexicons .

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Keywords: opinions; sentiment analysis; subjective; objective; emotions.

List of Abbreviation	
SA	Sentiment Analysis
AAC	Adverb-Adjective Combination
OM	Opinion Mining
NLP	Natural Language Processing
Sc	Score
VS	Variable Scoring
Aff	Affirmation
POS	Positive
NEG	Negative
NEU	Neutral
AL	Appraisal Lexicon
AACs	Adjective-adverb combination scores
Ⅎ	Function
SO	Semantic orientation

1. Introduction

Sentiment Analysis (SA) includes certain expressions that indicate personal opinions in the speaker's subjective beliefs. According to Wilson, *et al.* (2021), Sentiment Analysis is a type of subjective analysis that concentrates on specifying *positive* and *negative opinions*, *emotions*, and *evaluations* [1]. This paper concerns with sentence-level classification by exploiting adverb, adjective or adverb-adjective combination of the novel "*Sense and Sensibility*", It essentially tries to relate emotions, sentiments, opinions, and appraisals of the speaker or writer principally with the listener or recipient. The classification of adverbs of degree into four types will be dealt with.

In fact, the adjectives in reviews play an essential role in Opinion Mining (OM). Thus, opinion mining as a language-processing task requires different models and computational methods depending on the level of analysis.

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(1) Wilson, T.; Wiebe, J. & Hoffmann, P. (2021) *Recognizing Contextual Polarity in Phrase-level Sentiment Analysis.* In Proceedings of human language technology conference and on empirical methods in natural language processing.

OM uses a computational method is to specify "*opinionated content*" and put it into categories: POS or NEG [2](Singh, *et al.*, 2013). Sentiment classification includes techniques to classify reviews as positive or negative based on a bag of words either positive or negative words [3](Mullen & Collier, 2004;[4]Pang, *et al.*, 2002).

It is almost important to analyse sentences-level emotionally, sentimentally, pragmatically, and whether it is subjective and objective to better understanding their meaning semantically. To say more, the ambiguous meaning of the whole sentence disappears when it is associated with Adverb-Adjective Combination (AAC). The graduation of the lexicons (modifiers and adjectives) helps the listener to lucidly understand its strong meaning. Additionally, analysing word-level prototypically greatly facilitates its meaning.

1.1 Problem of the Research

The main problem of the current paper is clarifying opinions polarity found in the sentence or even in the word into three sets : Positive "POS", Negative "NEG" or Neutral "NEU". Accordingly, applications of sentiment analysis benefits from the fact that although systems are not extremely accurate at determining semantic orientation of word-level and sentence-level, they can accurately capture important changes in the scores and ratios of lexicons that indicate the semantic polarity into POS, NEG, and NEU. Thus, a question should be stated in this respect, are there precise applications can present accurate ratios and scores?. Additionally, one of the problems is how to elicit emotions like how much happiness there is in the opinion, how much remorse, how much anger, etc.

(2) Singh, V.; Piryani, R.; Uddin, A. & Waila, P. (2013) *Sentiment Analysis of Movie Reviews: A new Feature-based Heuristic for Aspect-level Sentiment Classification*. Conference: Automation, Computing, Communication, Control and Compressed Sensing (iMac4s), International Multi-Conference.

(3) Mullen, T. & Collier, N. (2004) *Sentiment Analysis Using Support Vector Machines with Diverse Information Sources.* Barcelona: Association for computational Linguistics.

(4) Pang, B., & Lee, L. (2008) "Opinion Mining and Sentiment Analysis" *Foundations and Trends (R) in Information Retrieval*, 2, Pp.1-135.

1.2   Aims of the Research

The aims are summarized in the following points:

1. Focusing on analysing the sentence-level by exploiting "*Natural Language Processing (NLP)*" to show the polarity of the sentences.

2. Determining the intensity or weakness of the adverb, adjective or AAC using computational methods to extract the semantic opinion or polarity of lexicons.

3. Analysing terms correlated to SA: *Opinions*, *Emotions*, *Sentiment,* as well as the basic model of SA *"Appraisal Lexicons"*, *Attitudes* concern to the sentences of the novel "Sense and Sensibility"

4. Identifying the sentence's subjectivity (i.e., whether the sentence is   factual in nature (objective) or whether it expresses a personal opinion on its subject matter.

1.3   Hypotheses of the Research

The hypotheses of the present research are the following:

1. It is hypothesized that a score of +1 is positive, +4 and more is maximally positive and -1 is (strongly negative), whereas 0.0 implies neutral.

2. It is expected that most of the opinion sentences, which mainly covers adverbs and adjectives, are divided into two sets "positive" and "negative" rather than neutral.

3. Adjectives show stronger effects than adverbs.

4. It is assumed that model of Dobrescu is formed in accordance with certain concepts to elicit the final orientation.

5. Model of Appraisal Lexicon (AL) has hypothesized some ratios of modifiers and adjectives related to focus.

1.4   Research Question

The research is intended to answer the following questions:

1. What is SA?

2. What is opinionated sentence, sentiment and emotion?

3. What is AL?

4. What are force and focus in the graduation of AL?

5. Are adverbs and adjectives exhibiting the same results?

1.5   Scope of the Research

The current research is limited to the description of opinion word and sentence level of the novel Sense and Sensibility in SA, focusing exclusively on analyzing the role of adverbs and adjectives in sentence and word level into subjective sentences, subjective neutral, objective sentences, emotions with sentiments and pragmatic sense which is related to sentiment so as to exhibit intended meaning of the speaker in which adverbs , adjectives or AAC reinforce the whole meaning of the sentence to indicate the final polarity. Furthermore, lexicons have been collected according to the gradual meaning of prototypicality in force and focus.

1.6   The Model Adopted

We have applied two models to analyse sentence-level, depending on "*Sentiment Analysis 2.0.0*" application, "*Monkey Learn Sentiment Analyzer*" and *"Variable Scoring"* algorithm. According to the model of Dobrescu, we have analysed concepts pertaining to SA: *Opinions*, *Emotions* and *Sentiments* concern to the sentences of the novel of "*Sense and Sensibility*" [5] (Austen, 2008) in order to decide the POS/ NEG/ NEU polarity or orientation opinion sentences. Additionally, we calculate the scores of adverb-adjective combination (AAC). Moreover, we have adapted an oriented schema to show the way of data analysis .

A new model of "sentiment classification" is presented in section 6 that is mainly designed to analyse appraisal groups as in "*very happy*" or "*not very happy"*. An appraisal group is defined as "a set of opinion attributed to several independent semantic taxonomies depends on *Appraisal Theory*" (Whitelaw, Garg & Argamon, 2005)[6]. In this paper, the researchers explain the use of adverbs, adjectives and AAC in SA to show the semantic opinion of the lexicons based on the opinion expressed in it.

2.   Definitions of Sentiment Analysis

Sentiment Analysis (SA) also called "Opinion Mining" (OM), "is the field of study that analyses people's opinions, sentiments, evaluations, appraisals, attitudes, and emotions towards

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(5) Austen, J. (2008) *Sense and Sensibility*. England: Oxford University Press.
(6) Whitelaw, C., Garg, N., & Argamon, S. (2005) *"Using Appraisal Groups for Sentiment Analysis"*. Conference: the 14th ACM international conference.

entities such as products, services, organizations, individuals, issues, events, topics, and their attributes." [7](Liu, 2012). Additionally, [8]Mukherjee (2012) mentions that SA and OM are similar to each other and they are used interchangeably. There are also many names and slightly different tasks, e.g., *Sentiment analysis, opinion mining*, *opinion extraction, sentiment mining*, *subjectivity analysis*, *affect analysis*, *emotion analysis* and *review mining* (Liu, 2012). However, they are now all under the umbrella of sentiment analysis or opinion mining.

In addition, sentiment analysis (SA) evaluates writers' opinions based on pivot items extracted from text. These items are called opinion bearing words or, simply, sentiments [9](Almashraee *et al.*, 2016). SA uses *(NLP)*, which aims to detect subjectivity in the sentence-level or to extract and classify opinions into different sets (POS, NEG and NEU).

Furthermore, opinion mining requires NLP, to extract semantics of opinion words and sentences. [10](Khan, *et al.*, 2016). So, identifying types of sentence is the most important part of opinion mining. Moreover, we have to classify the sentence either subjective or objective. The fundamental tasks that were handled in NLP are subjectivity analysis dealing with "*private states*". According to [11]Banfield (1982), private state could be defined as "*A term that encloses sentiment, opinions, emotions, evaluations, beliefs, and speculations.*" As far as sentiment analysis as NLP task is concerned, greatest part of the researches in field coincide with the subsequent definition: "*The binary classification task of labeling*

(7) Liu, B. (2012) *Sentiment Analysis and Opinion Mining*. Chicago: Morgan & Claypool Publishers.

(8) Mukherjee, S. (2012) *Sentiment Analysis*. India: Indian Institute of Technology.

(9) Almashraee, M.; Monett, D. & Paschke, A. (2016) *Emotion Level Sentiment Analysis: The Affective Opinion Evaluation,* Conference: Semantic Sentiment Analysis- ESWC 2016.

(10) Khan, T. M. ; Durrani, M. ; Ali, A. ; Inayat, I. ; Khalid, Sh. &, H. Kamran (2016) "Sentiment Analysis and the Complex Natural Language" *A Springer Open Access Journal*, Pp.1-19.

(11) Banfield,A.(1982).*Unspeakable Sentences Naration and Representation in the Language of Fiction*. London: Routeldge and Kegan Paul.

an opinionated document as expressing either an overall positive or an overall negative opinion is called sentiment polarity classification or polarity classification" (Pang & Lee, 2008).

2.   Classification of Adverb-Adjective Scoring Axioms

"An adverb is a word that describes how something is done; adverbs ourselves are not sentiment -laden, but it strengthens the sentiment conveyed in the context. The objective of sentiment analysis is to find out the opinion words of the sentences" [12](Haider, *et al.,* 2018).

A large part of the early research in sentiment focused on adjectives as the primary source of subjective content in a document [13](Taboada, *et al.*l, 2006). The researchers believe that adjectives are opinion words from which sentiments can be determined, calculated, and evaluated (Haider *et al*., 2018).

Most of the adverbs have no prior polarity, but when they are used with adjectives having sentiment content, they will have a vital role in identifying the sentiment of a sentence" [14](Alhammi & Haddar, 2020).

In this research, the researchers clarify how "adverbs of degree" for instance: extremely, hardly, really, etc., are used to express the "intensity" or "weakness" of the adjectives, e.g.,

1. "*He seemed **really delighted** by their arrival*" ,

The sentiment, word, "*really*" increases the intensity of the adjective "*delighted*". Now, the researchers describe how to give scores between 0 and 1 to adverbs of degree which modify adjectives. A score of 1 denotes that the adverb confirms an adjective, whereas a score of 0 (*totally neutral*) denotes that the

(12) Haider, S.; Afzal, M.; Asif, M.; Maurer, H.; Ahmad, A. & Abuarqoub, A. (2018) "Impact Analysis of Adverbs for Sentiment Classification on Twitter Product Reviews" *Concurrency and Computation: Practice and Experience*, 33, pp.1-16. https://doi.org/10.1002/cpe.4956

(13)   Taboada, M.; Anthony, C. & Voll, K.(2006) *Methods for Creating Semantic Orientation Dictionaries.* Italy: European Language Resources Association (ELRA)

(14) Alhammi, H. & Haddar, K. (2020) " Building a Libyan Dialect Lexicon-Based Sentiment Analysis System Using Semantic Orientation of Adjective-Adverb Combinations" *International Journal of Computer Theory and Engineering*, 12 (6), pp.145-150.

adverb hasn't effect on the score of an adjective, but we suppose that we have a score assigned to -1 (*maximally negative*) while +1 is positive and +2 or more (*maximally positive*) scale for each adjective and adverb.

According to [15]Benamara, *et al.*, (2007), adverbs of degree categorized as follows:

1. Adverbs of affirmation: these contain adverbs for instance: certainly, exactly, quite, completely, perfectly, really and absolutely.

2. Strong intensifying adverbs: these contain adverbs for instance: extremely, highly, deeply, very.

3. Weak adverbs as in scarcely.

4. Negation and minimizers: these contain adverbs for instance "*unfortunately*" and "*hardly*". The researchers treat these adverbs rather differently than the former three categories as they usually negate sentiments. Therefore, adverbs like "hardly" which are called "minimizers" can express "negative effect" on sentiment, as in:

2. "*The party was hardly good*",

The adverb "*hardly*" is a minimizer that reduces the positive score of the sentence. Consequently, minimizers tend to negate the score of the adjective to which they are applied. For instance, "*hardly good*" decreases the score of good since good is a "*positive*" adjective. In contrast, the use of the adverb "*hardly*" in "*hardly bad*" increases the score of "*bad*" because "*bad*" is a negative adjective [16](Benamara *et al*., 2007).

Besides, [17]Quirk, *et al.* (1985) classify intensifiers into two main categories, according to their polarity: Amplifiers (e.g. very)

(15) Benamara, F.;Cesarano, C.; Picariello, A.; Recupero, D. R.& Subrahmanian, V. S. (2007) *Sentiment Analysis: Adjectives and Adverbs are Better than Adjectives Alone*. *Proceedings of the International Conference on Weblogs and Social Media (ICWSM).*

(16) Ibid P.8

(17) Quirk, R; Greenbaum,S.; Leech, G. & Svartvik, J.(1985) *A Comprehensive Grammar of the English Language.* London: Longman, UK

increase the semantic intensity of a neighbouring lexical item, whereas downtoners (e.g. *Slightly*) decrease it.

"Computational Linguists suggest that adjectives are good markers of opinions" [18] (Singh, *et al*., 2013). For example, "*The dinner party was excellent*", the use of the adjective "*excellent*" tells us that the reviewer liked the party and possibly he had a fabulous experience enjoying it. Sometimes, adverbs modify the opinion expressed in review sentences. For instance, the sentence "*The party was* **extremely good**." expresses a more positive opinion about the *party* than the sentence "*The party was* **good**". The researchers inferred that "Adverb +Adjective" combination produces better results than utilizing adjectives alone. Adverbs are usually employed as modifiers.

Examples illustrate scores of some adverbs and adjectives:

Sc (easy)= 0.61   Sc (extremely)=0.0(neutral)

Sc (really)= 0.19   Sc (foolish)= -0.74

Sc (interested)= 0.20   Sc (good)=0.94

4.   **Procedures of the Research**

The computational methods and terminologies vary, however the main aim is to decide whether a sentence is subjective or not and, if subjective, whether it implies a positive or a negative opinion. The direction of the opinion (i.e., whether POS/NEG) is sometimes referred to "semantic orientation".

The fundamental task in sentiment analysis, then, is to have adequate information so that, when a new item (sentence, headline, excerpt or whole text) needs to be treated, its features can be removed to decide whether it contains positive or negative sentiment, based on present information [19] (Taboada, *et al.* , 2016).

The models and procedures discussed in this paper are limited to the major tasks of SA by exploiting adverb, adjective. Thus, a variable scoring algorithm is a computational method has been used to calculate AAC. Then, subjectivity labeling is recognizing sentences used to present opinions and evaluation of subjectivity (*subjective sentences*) from sentences used to

(18) Ibid P.3

(19) Taboada, M. (2016) Sentiment Analysis: An Overview from Linguistics". Canada : Simon Farar University.

objectively present verifiable information (*objective sentences*) [20](Wiebe, 2000). A model of *"Dobrescu*, 2011" has been utilized to show the effect of essential concepts on the sentiment polarity of the sentence-level. The second model is "Appraisal Lexicons" which discussed a set of attributes in section (6).

"Sentiment Analysis version 2.0.0" application has been utilized to extract the score and polarity in analysing sentences related to the concepts of SA. Additionally, "MonkeyLearn Sentiment Analyzer" application has been exploited to extract the ratios of "Appraisal Lexicons" in section (6).

4.1   Levels of Analysis Issues

4.1.1 Sentence Level

One of the classes of SA is the sentence level. At this level, the researchers focused on detecting a mixture of subjective and objective sentences.

4.1.2 Word Level

At this level, the focus is on looking for adjectives and adverbs. In addition, they can convey a sense of subjectivity and express opinions.

4.2   Unary AACs

To compute the sentiment value of an AAC, a score is related with it depend on the score of the adverb as well as an adjective. Therefore, AAC technique is used to extract the opinion at the word-level and sentence-level. We based our scoring algorithm on "*variable Scoring*". "A variable as the name implies, is something varies"   [21](Kaur, 2013). In addition, scores of adjectives and adverbs are extracted by using "Sentiment Analysis 2.0.0".

In VS algorithm there are two rules can be used in this aspect:

➢ "If adv €Aff U strong, then"

"$f$vs (adv , adj) = sc(adj) + (1- sc(adj) * sc(adv)"

➢ "If adv € Weak U doubt, then"

(20) Wiebe, J. (2000) *Learning Subjective Adjectives from Corpora*. Proceedings of the Seventeenth National Conference on Artificial Intelligence and Twelfth Conference on Innovative Applications of Artificial Intelligence.

(21) Kaur, S.,P. (2013) *Variable in Research*, 3(4), Pp:36.

"$f$vs (adv , adj) = sc(adj) − (1- sc(adj) * sc(adv)"
For example:
3. "*It would be enough to make them **completely easy**.*" P: 5
The following equation is applied "If adv € Aff U Strong" , then:
"$f$vs (adv,adj) =Sc(adj) +(1-Sc (adj) × Sc (Adv))", the adverb
"*completely*" is classified as one of the " *affirmation adverbs*" .

Table (1) : Total Scores of Positive AAC

Lexicons	Polarity	Score
Completely	Positive	0.15
Easy	Positive	0.61

"$f$vs (adv , adj) = sc(adj) + (1- sc(adj) * sc(adv)"
$$= 0.61 + (1 − 0.61) * (0.15)$$
$$= 0.61 + (0.39 * 0.15)$$
$$= 0.61 + 0.06$$
$$= 0.67$$

Thus, f for *"completely easy"* has a higher score POS than the POS adjective *"easy"*. Then, "*completely*" as a modifier enhances the semantic meaning of a neighbouring lexicon "*easy*". The final sentiment score of AAC is 0.67 (maximally positive) as explained in Table (1) .

4. " *It was an **extremely unhappy** marriage.*" P: 58

Table (2): The Force of Negative Adjective Compared by Neutral

Lexicons	Polarity	Score
Extremely	Neutral	0.0
Unhappy	Negative	-0.98

"$f$vs (adv , adj) = sc(adj) + (1- sc(adj) * sc(adv)"
$$= - 0.98 + (1 − (-0.98) * (0.0)$$
$$= - 0.98 + (1+0.98) * (0.0)$$
$$= - 0.98 + 0 = - 0.98$$

Although the polarity of the adverb *"extremely"* is neutral, it strengths the semantic meaning of the negative adjective "*unhappy*". Consequently, if we omit the adjective, the meaning will be incomplete, whereas if we omit the adverb, the meaning will be

semantically and syntactically correct. In addition, the adverb "*extremely*" alone cannot make any sense, as revealed in Table (2).

5. *"He was confused, seemed **scarcely sensible** of pleasure in seeing them."* P: 61

Table (3): Sentiment Scores of Negative Adverb and Positive

Lexicons	Polarity	Score
Scarcely	Negative	−0.3
Sensible	Positive	0.97

"$f$vs (adv , adj) = sc(adj) - (1- sc(adj) * sc(adv)"

$$= 0.97 - (1 - (0.97) * (-0.36)$$
$$= 0.97 - (0.03) * (-0.36)$$
$$= 0.97 + 0.01$$
$$= 0.98$$

The score of "*scarcely*" -0.3 refers to negative polarity, however, it has a slight impact on the semantic meaning of the adjective "*sensible*". The sentiment score of the adjective sensible 0.97 increases the sentiment value, as explained in Table (3).

6. "*You are **quite rude**"* P:79

Table (4): Scores of high Negative Adjective and
                        Positive

Lexicons	Polarity	Score
Quite	Positive	0.23
Rude	Negative	-0.92

"$f$vs (adv , adj) = sc(adj) + (1- sc(adj) * sc(adv)"

$$= -0.92 + (1- (-0.92) * (0.23)$$
$$= -0.92 + (1.92)   * (0.23)$$
$$= -0.92 + 0.44$$
$$= -0.48$$

The final sentiment score would assign according to mathematical processing is - 0.48 (maximally negative) in which the score of adverb "*quite*" is higher than the score of "*scarcely*". However, the score of the adjective is the predominant value, as shown in Table (4).

4.3   Subjective / Objective

The most important aspect in sentiment analysis (SA) is detecting subjective and objective content. In philosophy, subjectivity is the subject's feelings, beliefs, and desires." [22](Solomon, 2005).

According to [23]Banfield (1982), subjectivity refers to linguistic expression of private states. In addition, private state is defined as "A general term that covers opinions, beliefs, thoughts, feelings, emotions, evaluations, and judgment." [24](Wiebe *et al.,* 2005) .

[25]Liu (2010) differentiates between subjective and objective sentences as the following: "An objective sentence expresses some factual information about the world, while a subjective sentence expresses some personal feelings or beliefs." The following example has a subjective effect:

7. "*I have been extremely sorry to leave London*"   P: 195

  An example of objective sentence,

8. "*It was completely a puzzle."* P:246

Thus, subjective sentences are made up of views of the speakers, points of view, and opinions. When the sentence is neutral, it does not express any opinion. In addition, the objective sentence is more probably to be named as neutral sentence.

4.4   Concepts of SA in Dobrescu Model

There are three basic concepts considered essential procedures in analysing sentences in sentiment analysis:

4.4.1 Opinion

(22) Solomon, R. C. (2005) *Subjectivity in Honderich, Ted. Oxford Companion to Philosophy*. England: Oxford University Press.

(23) Ibid P.7

(24) Wiebe, J., Wilson, T. & Cardie, C. (2005) "Annotating expressions of   opinions and emotions in language". *In Language Resources and Evaluation*, Vol. 39, pp.1-54.

(25)Liu, B. (2010) *Sentiment Analysis and Subjectivity*. 2nd ed. Florida: Taylor and Francis Group, Boca.

An opinion is defined as a content that expresses a person's beliefs, values and feelings. Opinions cannot be considered to be true or false" [26](Burke, 2021).

According to [27]Liu (2010), the opinion is defined as:

- "*The holder of an opinion is the person or organization that expresses the opinion.*"
- "*An explicit opinion on feature is an opinion explicitly expressed a subjective sentence.*"
- "*An implicit opinion on feature is an opinion implied an objective Sentence.*"
- "*An opinionated sentence is a sentence that expresses explicit or implicit positive or negative opinions. It can be a subjective or objective sentence*"

Opinionated sentences express two types of information; first, the speaker's attitude which is related to an idea or belief; second, his attitude toward those who "agree" or "disagree" with him" [28](Mehrley & Mcroskey, 2009).

All tasks characterized within the opinion mining aim at classifying the sentences according to the "*orientation of the opinion*" (typically into three classes – of POS, NEG, and NEU). Additionally, some sentences consider as subjectively neutral that are more likely parallel to the objective [29](Dobrescu, 2011). "The orientation of an opinion on a feature indicates whether the opinion is *positive*, *negative* or *neutral*. Opinion orientation is also known as sentiment orientation, polarity of opinion, or semantic orientation" (Ibid).

(26) Burke, A. (2021) "Distinguishing Between Fact and Opinion, Biases, and Stereotypes: TEAS" *Register Nursing.org. Staff Writers.*

(27) Ibid P.13

(28) Mehrley, R. S., & McCroskey, J. C. (2009) "Opinionated Statements and Attitude Intensity as Pedictors of Attitude Change and Source Credibility" *Communications Monographs,* 37, Pp 47-52.

(29) Dobrescu, B. A. (2011) *Methods and Resources for Sentiment Analysis in Multilingual Documents of Different Text Types***.** Thesis. Alacant : University of Alacant .

4.4.2 Sentiment

The term *sentiment* proposes a specified opinion as a reaction of one's feeling. However, [30]Kim & Hovy (2005) define sentiment as "An explicit or implicit expression in the text of the Holder's positive, negative, or neutral regard toward the *Claim* about the *Topic*. Sentiments always involve the Holder's emotions or desires, and may be present explicitly or only implicitly". Accordingly, it's based on feeling about the situation or a way of thinking about something. Further, a sentiment also related with pragmatic sense. In fact, it is important to detect the pragmatic sense which should be interpreted by the listener, then it could change the sentiment value thoroughly into POS/NEG.

Thus, some opinions carry a sentiment whereas others do not. In order to illustrate the difference between opinions and sentiment, here are some examples:

9. "*I can believe it, but unfortunately he did not feel the same.*" P:129

10. "*I have been most deeply interested.*"   P: 178

These are sentences that express subjective opinions, yet they don't contain any sentiment.

The subsequent sentence carries opinion and expresses sentiment:

11. "*Your behaviour to him is perfectly cordial*" P: 14

The term "*feeling*" is characterized as the cognizant subjective insight of emotion. [31](Van den Bos, 2006). This is around a similar definition as the one given by [32]Scherer (2005) who states, "*The term feeling points to a single component of emotion, denoting the subjective experience process, and is therefore only a small part of an emotion* ."This implies that there are various sorts of opinions and that not all opinions are subjective

(30) Kim, S & Hovy, E. (2005) *Automatic Detection of Opinion Bearing Words and Sentences*. IJCNLP: Companion Volume to the Proceedings of Conference including Posters/ Demos and tutorial abstracts.

(31) VandenBos, G., R. (2006). *APA Dictionary of Psychology*, 2nd ed. Washington: American Psychological Association.

(32)   Scherer, K. (2005) "What are Emotions? and How Can They Be Measured?" *Social Science Information,* 3, Pp. 695-729.

as well as not all opinions have a sentiment related to them [33](Dobrescu, 2011). This also points to the fact that the sentiments are types of opinions, namely the ones that are "*reflective of one's feelings*", where "*feeling*" is the "*conscious subjective experience of emotion*". Thus, sentiment relates to emotion, in the sense that it is the expression of an evaluation based on the emotion of the writer's feel (Ibid.).

4.4.3 Emotion

According to [34]Ortony (1997), *emotion* is a much more complex process, whose expression in language may not consistently have a subjective task. Therefore, emotions are our subjective feelings and thoughts. Emotion detection and classification is the phenomenon of detecting linguistic expressions of emotion from the context as well as putting them into categories, as in "anger, fear, sadness, happiness, surprise, disgust, etc."Figure (1) illustrates the "Plutchik's wheel of emotion".
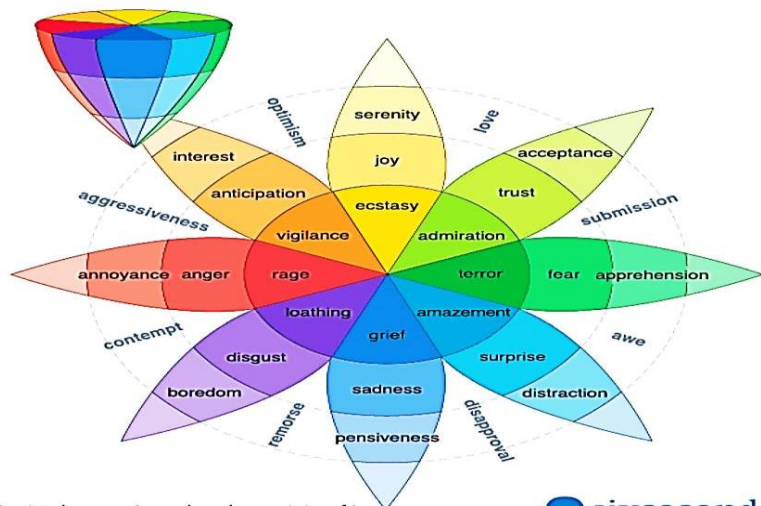
Figure (1): "Plutchik's Wheel of Emotion" (Plutchik, 2001)

(33) Ibid P.14
(34)Ortony, A. (1997) *Metaphor and Thought*, 2nd   ed. England: Cambridge Press.

Figure (1) refers to the primary emotions which can be conceptualized in a fashion analogous to a colour wheel. These emotions are corresponded with Dobrescu model. Third dimension represents the intensity of emotion. Then, the structural model of emotion is shaped like a cone. Some examples are given to denote the differences between "subjectivity", "objectivity", "opinionated sentence", "emotion", "sentiment", and "polarity" - Polarity is classified into two types i.e. positive or negative opinion-. Below in (Table 5), "Y" stands for "Yes", "N" for "No", "POS" for

Table (5): Examples for the Major Concepts of Sentiment Analysis

No.	Examples	Subjective	Opinionated	Emotion	Sentiment	Polarity
1	"*I have been most deeply interested*." P:178	Y	N	Y	N	NEU
2	"*Colonel Brandon appeared to be deeply in love with Marianne.*" P:23	Y	Y	Y	Y	POS
3	"*Miss Dashwood completely approved of Edward, in spite of his quiet manner.*" P:7	Y	Y	Y	Y	POS
4	"*Her voice was completely lost in passionate and bitter a sobbing.*" P:55	Y	Y	Y	Y	NEG
5	"*Her judgment, It was completely a puzzle.*" P:246	N	N	N	N	NEU
6	"*Marianne you consider the matter exactly as a sensible person should.*" P:83	Y	Y	Y	Y	POS
7	"*Marianne may not seem exactly the person to attract him.*" P:253	Y	Y	Y	N	NEG
8	"*I can believe it, but unfortunately he did not feel the same.*" P:129	Y	Y	Y	N	NEG
9	"*Unfortunately, the heart does not lead us to the most suitable direction.*"	Y	Y	Y	Y	NEG
10	"*Your behaviour is perfectly cordial.*" P:14	Y	Y	Y	Y	POS
11	"*I felt the bone, and it's perfectly sound.*"	Y	Y	Y	Y	POS

"Positive", "NEG" for *"Negative"* then "NEU" for

12	"*Mrs. Dashwood looked with pleasure at Marianne, whose fine eyes were completely fixed on Willoughby.*" P:52	N	N	Y	Y	POS
13	"*I certainly did not seek your confidence.*" P:93	Y	N	Y	Y	NEG
14	"*Margret had reached age highly suitable for dancing.*" P:256	N Subjective neutral	Y	N	N	POS
15	"*The grounds were declared to be highly beautiful.*" P:43	Y	Y	Y	Y	POS
16	"*It was an extremely unhappy marriage.*" P:58	N Subjective neutral	Y	Y	Y	NEG
17	"*I should have been extremely sorry to leave London.*" P:195	Y	Y	Y	Y	NEG
18	"Miss Smith was extremely angry at my behavior." P:79	Y	Y	Y	Y	NEG
19	"*He seemed really anxious to accommodate them.*" P: 16	N Subjective neutral	Y	Y	Y	POS
20	"*Poor Mariane now felt really ill, and extremely miserable.*" P: 76	Y	Y	Y	Y	NEG

5. Data Analysis and Results

The semantic polarity of data analysis is assigned by using the application of "*Sentiment Analysis version 2.0.0*". We have adopted the model of *"Dobrescu, 2011*" to analyse the sentences according to the concepts mentioned earlier. Figure 2 reveals the classes that are very frequently used in OM/SA is not precisely correlated. As mentioned above not all the opinions are subjective nor do they have to denote sentiment in all cases. Statements that consider an opinionated sentence must not necessarily contain an emotion and sentiment. In addition, they are not associated with them sentimentally, e.g.

1."*Margret had reached age **highly suitable** for dancing.*" (P: 256), see Table (5), sentence No. 14.

It is an opinionated sentence since the communicator can agree or disagree with the idea. Semantically, the adverb "*highly*" increases the semantic intensity of the adjective and the positive polarity of the sentence. It refers to subjective neutral, as the SO is

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most likely similar to be objectivity. In addition, the adverb "*highly*" enhances factual information.

Accordingly, a sentence may denote an "emotion" without denoting any sentiment, e.g.

2."*I have been most **deeply interested**.*" (P: 178), see Table (5), sentence No. 1.

This sentence is subjective because it expresses personal feelings correlated to the person. Moreover, it is not opinionated sentence, for it does not denote any communicator's attitude as well as it does not indicate any attitude to agree or disagree with the speaker. The adverb "*deeply*" with the adjective "*interested*" reinforce the emotional value which represents by the expression "*interest*". In addition, there is no any sentiment has stated here the meaning is direct, therefore the pragmatic sense is not obvious and there is no claim about the topic here as well as there is no way of thinking and direct feeling about the situation.

It was noticed that in Table (5), a sentence may express all the classes, e.g.

3."*Colonel Brandon appeared to be **deeply** in love with Marianne.*" P:23. As seen in Table (5), sentence No. 2.

In this sentence, there is an obvious personal feeling; it is also considered opinionated because there is a communicator's attitude as well as the communicator can agree or disagree with the idea. Obviously, the emotion of love overwhelmed them since the adverb "*deeply''* enhances the semantic meaning of the sentence with a strong emotional value. The sentence clearly denotes the sentiment for it illustrates the pragmatic sense reinforced by the adverb "*deeply*" which contextually adds a strong sentiment for the situation and there is a claim for the topic. Furthermore, the polarity of this sentence refers to the positive orientation.

Obviously, a sentence may express all the concepts mentioned in Table (5), nevertheless without expressing sentiment value, e.g.

4. "*I can believe it, but **unfortunately** he did not feel the same.*" P: 129. As shown in Table (5), sentence No. 8.

Noticeably, there is no distinct sentiment in the above sentence (4), as the adverb "*unfortunately*" semantically and

contextually reinforces the contrastive feeling. Consequently, there is no obvious intended meaning which can be interpreted by the listener. Additionally, this sentence refers to an emotional value, as the adverb "*unfortunately*" contextually enhances the disapproval emotion.

A sentence may not express subjectivity, but it is subjectively neutral and expresses all the concepts mentioned in Table (5), e.g.
5. "*It was an **extremely unhappy** marriage*." (P: 58). As seen in Table (5), sentence No. 16.

This sentence is subjective neutral, as SO has more tendency toward objectivity which expresses negative factual information. AAC is clearly indicated the emotion of sadness or grief.

Furthermore, it expresses sentiment since the pragmatic sense which can be indicated by interpretation of the listener implies that they are incompatible couples. Additionally, AAC *"extremely unhappy*" can be considered as one unit of information modifies the negative polarity of the sentence.

In the following sentence, the strong conscious subjective experience of emotion correlated with sentiment, e.g.
6. *"I certainly did not seek your confidence*" (P: 93), see Table (5), sentence No. 13.

The above sentence expresses the feeling of conscious subjective experience of emotion which can relate emotions with sentiments. In this respect, it is worth mentioning that novel of "*Sense and Sensibility*" creates a strong link between mind and feelings, sentiments as well as emotions. As we observed, most of the sentences overlapped sensations with sentiment and emotion. In addition, an emotion emphasizes a person's feeling caused by an entity; emotion can essentially be regarded as sentiment with a strong intensity [35](Liu, 2015). However, concept of sentiment is stronger than emotion, as sentiment conveys conscious emotional feeling; besides, it also associated with pragmatic sense. Thus, the intended meaning is clearly interpreted by the listener since the adverb "*certainly*", semantically, conveys conviction and reinforces

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(35) Liu, B. (2015) *Sentiment Analysis: Mining Opinions, Sentiments, and Emotions*. England: Cambridge University Press.

the negative intended meaning that represented by the negative mark "not". Accordingly, the speaker uses the adverb "*certainly*" to enhance and reach his intention to the listener. Then, the intended meaning is obvious to the listener that the speaker is not trustworthy. Therefore, according to pragmatic sense, the correlated relationship is distinctly indicated. Moreover,

7. *"Your behaviour is **perfectly cordial**."* P: 14. As shown in Table (5), sentence No. 10.

Obviously, the sentence also expresses the conscious subjective experience of emotion of the speaker. AAC "*perfectly cordial*" illustrates the intended meaning that principally appears the behaviour is warm and charming.

Additionally, a sentence may express a mixture of emotions, e.g,

8. "*He seemed **really anxious** to accommodate them*" P:16, see Table (5), sentence No. 19.

Noticeably, AAC "*really*", *"anxious"* alludes to a mixture of emotional values which can be represented an expected   "*surprise*" and "*joy*".

However, sometimes the underlying emotion that is expressed is not stated directly in the sentence. In the following sentence, the underlying emotional value refers to "*anticipation*" expression.

9. "*Marianne may not seem **exactly** the person to attract him."* (P:253). As seen in Table (5), sentence No. 7.

While "*Unfortunately the heart does not lead us to the most suitable direction*" P: 35, sentence No. 9, describes the mixed emotions in which the adverb "unfortunately" enhances disapproval and anticipation emotions. Henceforth, the speaker's intended meaning refers to the conflict between mind and heart. Furthermore, it is subjective since it indicates the personal judgment of private state.

In the novel of "*Sense and Sensibility"*, Jane Austen describes the relationship between two protagonists, Marianne and Willoughby. After weeks of intimate acquaintanceship, Willoughby suddenly leaves Marianne. "In this sense, Austen refers to a special sentimental characteristic "virtue in distress": an innocent, sensible

and morally pure figure is put in a cruel world full of corruption and dishonesty ([36](Vermeir & Deckard, 2012).

10. *"Poor Marianne now felt **really ill** and **extremely miserable"**.* (P:76). See Table (5), sentence No. 20.

Consequently, the related relationship between emotion and sentiment is distinctly indicated. The emotional mixture, which expresses inner and conceptualizing emotions, refers to sadness, depression, grief and disappointed. In Sentiment, the pragmatic sense reveals that she is emotionally shocked. According to the lexicons expressed, the semantic orientation is negative.

Finally, adverbs, adjectives, or AAC has a great role in increasing or decreasing the polarity of the opinion sentiment of the sentences. In fact, the accuracy of application which has been employed in SA can never be accurate 100%. In addition, the emotional expressions can be elicited accurately by facial expressions. The researchers adapted the following schema to illustrate the way of analysing and classifying sentences.

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(36) Vermeir, K & Deckard, M. (2012). *The Science of Sensibility: Reading Burke's Philosophical Enquiry.* London: Springer.

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                    ┌─────────────────────────┐
                    │    Sentiment Analysis   │
                    └─────────────────────────┘
                                │
                                ▼
                    ┌─────────────────────────┐
                    │      Sentence-Level     │
                    └─────────────────────────┘
```

| Subjective | → | Linguistic expression of private state | ↔ | Perspective, personal feelings, beliefs and speculations |

POS, NEG, NEU

| Objective | → | Factual information |

Polarity

| Opinionated Sentences | → | Communicator's attitude, idea, belief and his attitude to agree or disagree | ↔ | Opinionated sentences express explicit or implicit |

Computational treatment

| Emotion | → | Linguistic expression of emotion |

| Sentiment | → | Claim about the topic, feeling about the situation, way of thinking about something, and sometimes conscious subjective experience of emotion |

Pragmatic

Intended → represented by interpretation of the listener or the

Figure (3): The Scheme of Analyzing Concepts of

6.Appraisal Lexicon (AL)

Appraisal, the second model of SA in analysing the word and sentence level of novel "Sense and Sensibility", is a linguistic theory of subjectivity [37](Taboada & Grieve, 2004) based on appraisal theory, which includes appraisal as a component in the emotion episode" [38](Moors *et al.*, 2013). Thus, appraisal determines the intensity and quality of action tendencies, behaviour, physiological responses and feelings (Ibid).

The Appraisal system [39](Martin, 2003), within Systemic Functional Linguistics, is an endeavour to model language's capacity to express and negotiate opinions and attitudes within the text [40](Taboada & Grieve, 2004). [41] (Martin & White, 2005) divides the appraisal system into three sub-systems (see Figure 8): Affect, Appreciation, and judgment, which model the capacity to express emotional, moral, and aesthetic opinions respectively. Since Martin's model is lexically rather than syntactically based, he is primarily concerned with words and semantic classifications of words that permits a speaker to express different types of opinions. [42](Taboada & Grieve, 2004).

Our paper focuses on identifying "adjectival appraisal groups" of which has an "appraising adjective" as ahead as in "disappointed" "happy" and "rude" and preceded by a sequence of modifiers such as (very" and "slightly).

(37) Taboada, M. & Grieve, J. (2004 "*Analyzing Appraisal Automatically*" Proceedings of the AAAI Spring Symposium on Exploring Attitude and Affect in Text: Theories and Applications. Pp: 158- 161.

(38) Moors, A.; Ellsworth, Ph. C.; Scherer, K.R. & Frijda, N.H. (2013) "Appraisal Theories of Emotion: State of the Art and Future Development" *International Society for Research on Emotion*, Vol. 5, No.2, Pp. 119-124 http://emr.sagepub.com/content/5/2/119

(39) Martin, J. (2003) "Introduction, Special issue on Appraisal*" Scientific Research, Springer Open Access Journal*, Pp. 171-181.

(40) Ibid P.23

(41) Martin, J. & White, P. (2005). *The Language of Evaluation: Appraisal in English*. London: Palgrave Macmillan UK.

(42) Ibid P.23

6.1 Appraisal Expressions

An appraisal expression is "an elementary linguistic unit that conveys an attitude of some kind towards some *"targets"*. Additionally, appraisal expressions include "*sources*", *"attitudes"*, and *"targets"*, each are expressed by "various attributes" [43](Bloom *et al*., 2007). For example,

1. "*I found the party **quite dull**"*,

The speaker (the *Source*) expresses a negative attitude '*quite dull'* towards 'the party' (the *Target*).

Nouns, verbs, adjectives, and metaphors may be expressed by the attitude. By similarity to information extraction, the researchers consider representing an appraisal expression as a frame which filled with several slot values, giving (at least) the *Appraiser*, *Appraised, Appraisal Type*, and *Orientation* (POS/NEG) [44](Whitelaw *et al.*, 2005). For example, the appraisal in the following sentence:

2. "*I never spent a **beautiful** morning in my life."* P:48,

 The frame could be represented as follows:

Appraiser: (source): (I) speaker

Appraised: (target): morning

Attitude: (beautiful) appreciation reaction-quality

Orientation: negative

6.2 Taxonomies of appraisal

Our model is grounded in Appraisal Theory, which analyses the way opinion is expressed. The *Appraisal Theory* "is a cognitive frame claiming that people's emotions are elicited by their personal and continuous interpretations, evaluations, or appraisals of objects, events and situations." [45](Dragos *et al*., 2018). the researchers will

(43) Bloom, K. ; Garge, N. & Argamon, Sh. (2007). *Extracting Appraisal Expressions* . New York: Association for Computational Linguistics.

(44) Ibid P.6

(45) Dragos, V., Battistelli, D., & Kelodjoue, E. (2018) *Beyond Sentiments and Opinions: Exploring Social Media with Appraisal Categories*. 21st International Conference on Information Fusion (FUSION) .

present four kinds of attributing appraisal groups [46](Martin & White, 2005): "Attitude, Orientation, Graduation, and "Polarity":

1. **Attitude** gives the kind of appraisal being expressed as either *affect*, *appreciation*, or *judgment* [47](Whitelaw *et al*., 2005). Affect is related to linguistic expressions of a "personal emotional aspect" (e.g., 'sad', 'joy', 'grief', 'disgust'), as well as the most obvious "subjective kind of appraisal".

The other two denote evaluation which differentiate between evaluation of intrinsic appreciation of object states (e.g., 'slender', 'ugly')" [48](Bloom *et al*., 2007). "Appreciation is related to assessment and evaluations of entities, objects, events and scenes" [49](Dragos *et al*., 2018). Moreover, the other type represents "social judgment" which expresses interactions and behaviours in the social context: (e.g., 'heroic', 'foolish', 'clever', 'brave'). Figure (8) gives more detailed about the several options in Attitude with illustrative adjectives.

2. **Orientation** is whether the appraisal is *positive* or *negative, often* simply termed 'sentiment'. [50]Hatzivassiloglou & McKeown (2002) state that semantic orientation (SO) alludes to a real number measure of the positive or negative sentiment expressed by a word or phrase. In addition, words that encode a desirable state (e.g. *beautiful*, *unbiased*) have a positive orientation, while words that represent undesirable states have a negative orientation (Ibid).

3. **Graduation** portrays the power of appraisal in terms of two autonomous dimensions of force or ('intensity') and focus ('prototypicality'). There are various modifiers which express graduation such as "*very*" (increased force), "*slightly*" (decreased force), "*really*", "absolutely" (sharpened focus), or "sort of" (softened focus). A head adjective can also be express graduation

(46) Ibid P.23

(47) Ibid P.6

(48) Ibid P.24

(49) Ibid P.24

(50) Hatzivassiloglou, V. and Wiebe, J. (2000) *Effects of Adjective Orientation and Gradability on Sentence Subjectivity*. COLING : The 18th International Conference on Computational Linguistics, 1, Pp: 299-305 .

lexically, e.g., *"greatest"* vs. *"great"* vs. *"good"*. [51](Whitelaw *et al.,* 2005).

4. **Polarity** of an appraisal is "marked" if it is scoped in a polarity marker (such as 'not'), or "unmarked" otherwise. Other attributes of appraisal are impacted by negation; for instance, "not good" communicates an alternate sentiment from "good" (Ibid.).

Figures (4) and (5) illustrate the categories introduced by appraisal theory to characterize appraisal expressions and adding an

Attitud
Orientation
Graduation
Polarity
Modifiers
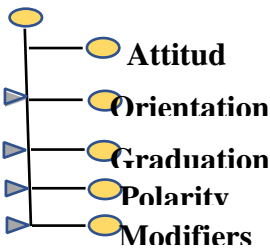
Fig. 4. Main concepts of the

Graduation
Focus
soft
sharp
Force
low (decrease)
high (increase)
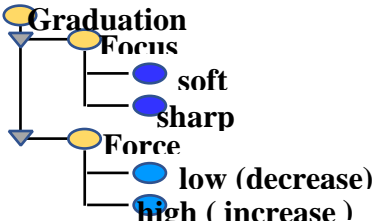
Fig. 5. Graduation concept

additional concept. Five main concepts were identified in Figure (4).

Thing

Obviously, modifiers shown in Figure (6) are concepts anticipated to capture the capacity of linguistic markers in Figure (7) to increase, decrease, or reverse the power.

Modifiers
Decrement
Increment
Negate
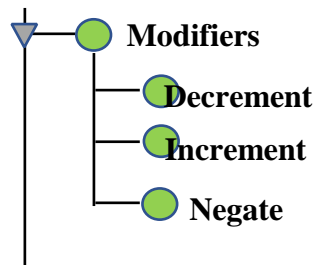
Figure 6: Modifiers concept

slightl
really
very
neve
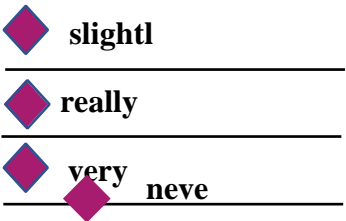
Figure 7: Modifiers of various concepts

(51) Ibid P.6

composition-

detailed, elaborate, convoluted

composition-

consistent, symmetrical,

reaction-impact

amazing, compelling, dull, monotonous

reaction-quality

beautiful, elegant, awful,

valuation

innovative, profound, derivative,

APPRECIAT
TYPE

appreciat

affec

happy, joyful, gloomy, miserable

TYPE

ATTITUD

attitu

tenacity

brave, faithful, disloyal,

normality

famous, lucky, popular,

capacity

clever, competent, foolish,

JUDGEME
TYPE

judgme

SOCI
ESTEAM-
TYPE

social-

Figure (8): Taxonomies of Appraisal Groups with
Adjectives (Whitelaw, Garg, Argamon, 2005)

As revealed in Figure (8), attitude type consists of three appraisals adjectives *"appreciation""*, *effect"* and *"judgment"*. Each of these attributes show the major sub-types in which mostly correlate with positive or negative impact or reaction as well as

judgment type. The effect is expressed in the state of an appraiser's emotion.

6.3   The lexicons

The researchers employed a technique which is semi-automated to form a lexicon presenting appraisal values with adjectives in comparative and superlative degrees which are regarded as 'high' and 'maximum' force and focus respectively. The value of each adjective is presented; for instance, the lexical degree for "rude" is the following:

'*rude*'

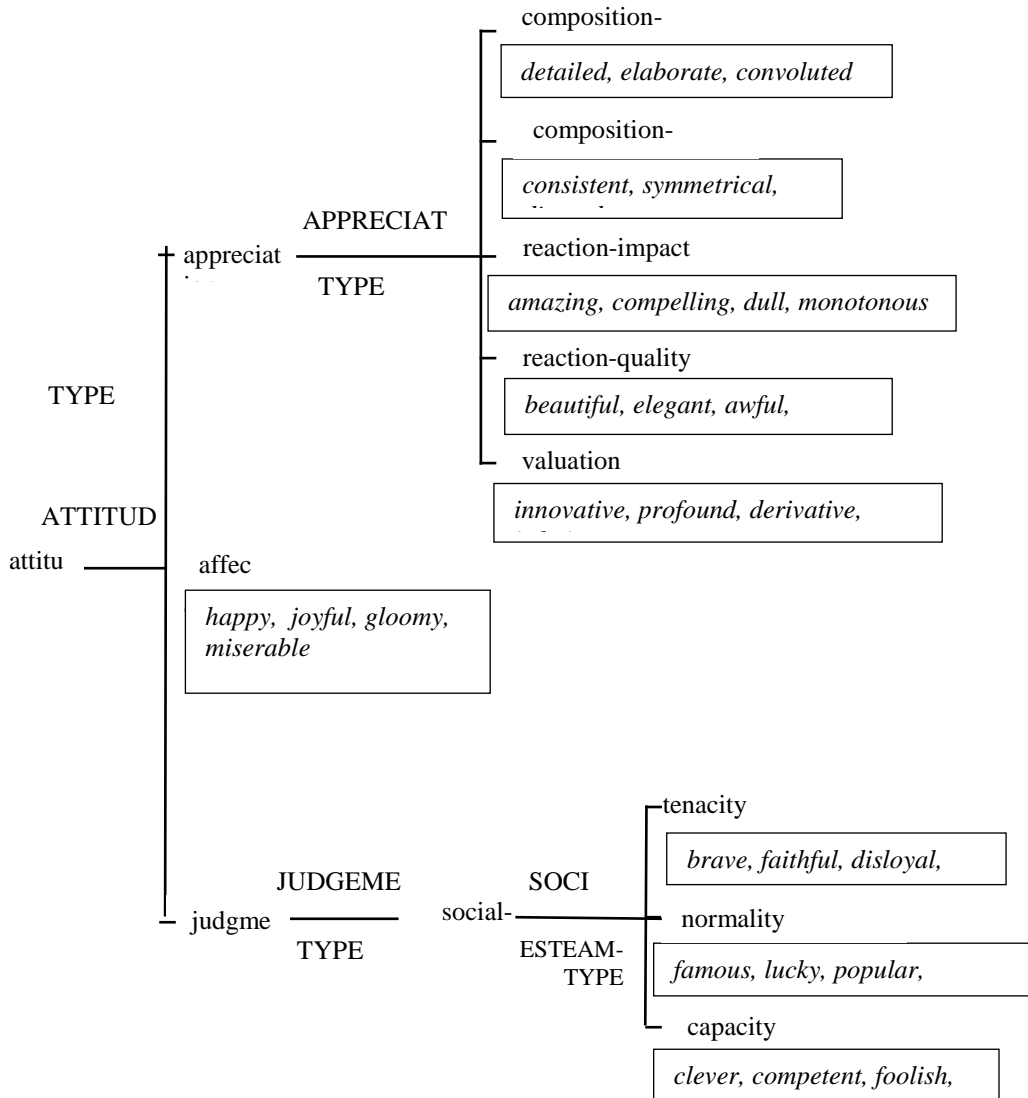|	
Attitude:	judgment/social-esteem/tenacity
Orientation:	negative
Force:	neutral
Focus:	high
Polarity:	unmarked

Modifiers, particularly adverbs, give transformations for appraisal attributes, for example:

Or   '*very*'
          Force: increase

polarity modification as in 'not':

'*not*'
Force: reverse
Orientation: negate
Polarity: marked

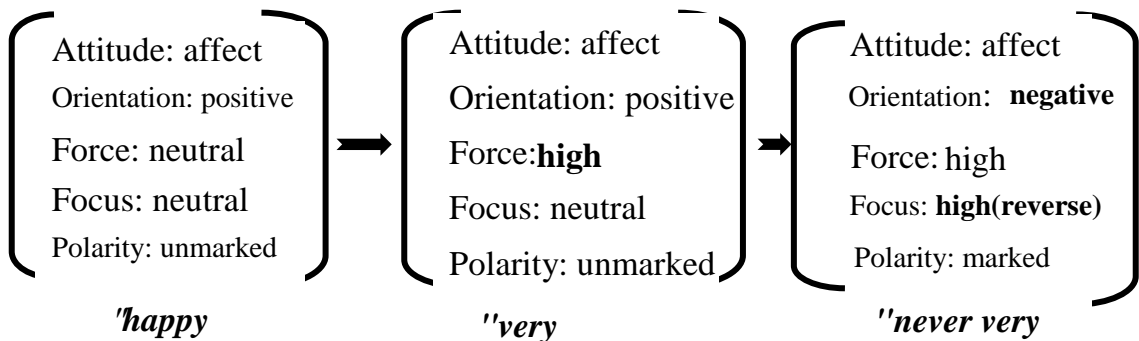## 6.4   Analysing of Appraisal Lexicons

Appraisal groups may be expressed by a "*head adjective*" which is preceded by a sequence of optional appraisal modifiers,

each presenting a switching state of one or more attributes of the head as in "*Elinor herself was extremely miserable*" P: 84

"*extremely miserable"* has miserable as a head and *extremely as* a modifier". The use of pre-modifiers and a typical word order are allowed for intervening adverbs" [52](Whitelaw *et al.*, 2005). Accordingly, this could be noticed in groups like as in "*never make each other very happy" where* "*never*" and "*very*" modify "*happy*".

The analysis of lexicons below illustrates the working process of the appraisal attributes of the novel -"Sense and Sensibility"- which we describe below.

1. *"I am sure they'll **never** make each other **very happy "***   P: 97

Attitude: affect	Attitude: affect	Attitude: affect
Orientation: positive	Orientation: positive	Orientation: **negative**
Force: neutral	Force:**high**	Force: high
Focus: neutral	Focus: neutral	Focus: **high(reverse)**
Polarity: unmarked	Polarity: unmarked	Polarity: marked
"happy	*"very*	*"never very*

2." *He was a **very clever,** very dangerous man*   P:103

Attitude: judgment/social esteem/capacity	Attitude: judgment/social esteem/capacity
Orientation: positive	Orientation: positive
Force: neutral	Force: **high**
Focus: neutral	Focus: neutral
Polarity: unmarked	Polarity: unmarked
"*clever*"	**"*very clever*"**

---

(52) Ibid P.6

3. *"I was **afraid** you would think I was talking a great liberty with you"*   P: 94

> Attitude: affect
>
> Orientation: negative
>
> Force: neutral
>
> Focus: neutral
>
> Polarity: unmarked

"afraid"

4.
*"His impudence had made her **miserable** for a while."* P: 96

> Attitude: affect
>
> Orientation: negative
>
> Force: neutral
>
> Focus: **high**
>
> Polarity: unmarked

"miserable"

5. *"The **sort of** desperate calmness with which this was said, lasted no longer than while she spoke."* P:124

> Force: **low**
> Focus: **soft**

"sort of"

6. *"Elinor could **hardly** keep her countenance as she assented to the hardship of such an obligation."* P: 80

> Orientation: negative
>
> Force: **high**
>
> Focus: high(sharp)
>
> Polarity: marked

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"hardly"

7. *"It is **amazing** how disagreeable she found it*." P: 9

> Attitude: appreciation /reaction-impact
> Orientation: positive
> Force: **neutral**
> Focus: neural
> Polarity: unmarked

"*amazing*"

8. "*She could therefore only look her tenderness, and after **slightly** addressing him, said no more*." P: 165

> Force: decrease (**low**)
> Focus: neutral

"*slightly*"

9. "*I shall never see a man whom I can **really** love*."P: 13

> Force: **high** (increase)
> Focus: high (sharp)

"*really*"

10. *"At one moment she was **absolutely** indifferent to the observation of all the world."* P: 138

> Force: **high**
> Focus: sharp

"*absolutely*"

11. "*His spirits were **certainly worse** than when at Barton.*" P: 116

Attitude: appreciation / reaction-quality
Orientation: negative
Force: **high**
Focus: sharp
Polarity: unmarked

"***certainly worse***"

12. " *You are **quite rude**"* P:79

Attitude: judgment/ social-esteem/ tenacity
Orientation: negative
Force: **high**
Focus: high (sharp)
Polarity: unmarked

"quite rude"

13. "*John and Fanny are **not entirely** without any merit.*" P: 251

Orientation: negate
Force: reverse
Polarity: marked

"not"

Force: **increase**
Focus: neutral

"entirely"

14."*I am afraid that a good, thoughtful mother like Mrs Ferrars, with such a **very large** fortune."* P: 68

Attitude: appreciation/ reaction-quality
Orientation: positive
Force: **high**
Focus: neutral
Polarity: unmarked *"*

"very large"

15. *"My engagement to Lucy **certainly** was **foolish**"* P: 85

Attitude: judgment/social-esteem/capacity
Orientation: negative
Force: **high**
Focus: neutral
Polarity: unmarked

"certainly foolish"

16. "*I shall be **quite disappointed** if you do not come.*" P: 78

Attitude: affect
Orientation: negative
Force: **high**
Focus: high (sharp)
Polarity: unmarked

"quite" disappointed"

Table (6): Ratios of modifiers in Monkey Learn Sentiment Analyzer

No.	Modifiers	Ratios	Focus			Force
			Sharp	neutral	soft	low
1	*very*	74.2%		✓		
2	*quite*	86.9%	✓			
3	*really*	73.4%	✓			
4	*certainly*	40.8%		✓		
5	*slightly*	75.8%				✓
6	*absolutely*	75.7%	✓			
7	*never*	94.8%	✓			
8	*entirely*	71.8%		✓		
9	*hardly*	94.1%	✓			
10	*sort of*	38.9%	✓		✓	

Table (7): Ratios of adjectives in MonkeyLearn Sentiment Analyzer

No.	Adjectives	Ratios	Orientation	Classes	Sub-classes	Focus	
						Sharp	Neutral
1	*happy*	76%	Positive	affect	-		✓
2	*clever*	87.5%	Positive	judgment	capacity		✓
3	*afraid*	50.7%	Neutral	affect	-		✓
4	*miserable*	99.7%	Negative	affect	-	✓	
5	*amazing*	98.6%	Positive	appreciation	reaction-impact		✓
6	*foolish*	92.7%	Negative	judgment	capacity		✓
7	*worse*	99.8%	Negative	appreciation	reaction-quality	✓	
8	*rude*	95.3%	Negative	judgment	tenacity	✓	
9	*disappointed*	95.2%	Negative	affect	-		✓
9	*cold*	61.5%	Neutral	appreciation	reaction-quality		✓

7.　Discussion and Results of Appraisal Lexicons

In analysing the data, the following results have been drawn:

First, It is explored that appraisal model is obviously correlated to the concept of sentiment based on "Appraisal Theory". This is a framework of linguistic resources enclosed in discourse semantics, which describes how inter-subjective and ideological positions (the language of emotion, ethics, and aesthetics) are expressed by writers and speakers.

Second, according to this theory, it has been noticed in Figures (4 & 8) that emotion is achieved by attitude type that is determined by the specific semantics of the graduated categories. Furthermore, we found that AL investigates the semantic meaning by which word-level convey positivity and negativity attitudes.

Third, It is explored that affect refers to an emotional value and is the most distinctly subjective type of appraisal.

Fourth, affect, appreciation and judgment have been interpreted by greater or lesser degrees of positivity or negativity, then we deduced that semantic orientation features of adjectives present an evaluative characterization of a word's deviation for its semantic group (e.g. brave is positive oriented, as opposed to coward).

Fifth, Figures (5, 6 & 7) show modifiers that pertaining to the term 'force', which covers assessments as the degree of intensity and amount. Therefore, assessments of the degree of intensity can operate through qualities, e.g. '*slightly silly* ', '*extremely silly*'.

Sixth, It could be seen in Figure (5), the term 'focus' is being graduated according to prototypicality, which means the gradual mental representation of meaning or categorization, then the effect varies according to whether the value of a modifier or an adjective is sharpening or softening. Table (2) illustrates the distribution of modifiers, for example, "really 73.4%" is the highest lexicon in "focus", as it highly affects on the semantic sense of sentence-level. Thus, in section 8.4, example 8,

1. "*I shall never see a man whom I can* **really** *love*". P: 14

The modifier '*really*' functions both as intensifiers of power and as a sharpening of focus. Whereas "*The* **sort of** *desperate calmness with which this was said, lasted no longer than while she spoke.*", the adverb *"sort of* 38.9%" is soft in focus and low in force.

Additionally, in Table (3) we present nine examples of adjectives in which the ratios have been calculated by *"MonkeyLearn Sentiment Analyzer"* application. Adjective "*Happy* 76%", for example, which is used to denote an opinion and considered to be an "*affect adjective*", it considered as neutral in focus since the lexicon *"overjoyed* 84%" is the strongest one in the category according to prototypicality in graduality. On the other hand, for example,

2.   "*He was a very* **clever**, *very dangerous man.*" P: 103,

"*clever* 87.5%" is used as an adjective as *"judgment/capacity"*, for it often expresses an opinion about someone else's look like. Generally, opinions, behaviours, and personal tastes are conveyed in the social contexts. Thus, according to "focus", the lexicon *"clever"* is neutral since the adjective *"brilliant* 97.3%" is the strongest and clearest example in the category or the gradual meaning. However, "*very clever*" consider high in force

Hence, according to the focus type, the researchers concluded that instead of saying, for example,

3. "*I am afraid that a good, thoughtful mother like Mrs Ferrars, with such a **very large** fortune."* P:68,

 "very large" can be substituted by another stronger lexicon, where the linguistic modifier *"very 74.2%"* is neutral in focus, for its functions just as a modifier as well as the adjective *"large 79.7 %"* is neutral in focus. Then, "*huge 91.4 %*" is the clearest and strongest lexicon as meaning and ratio. The semantic orientation is "POS".

 4. *" I shall be **quite disappointed** if you do not come."* P:78

Here the modifier "*quite* 86%" is indicated as *"sharp"* of focus and *"high"* of force, so it increases the semantic meaning of the lexicon "*disappointed"* in which this adjective alone is not considered as the strongest one since the adjective "*frustrated* 96.2% " is the strongest in focus. Thus, the appraisal group *"quite disappointed"* is sharp due to the strongest linguistic intensifier *"quite* 86.9%". However, there are intensifying adverbs reverse the semantic sense of the sentence, e.g.

5. *"Elinor could **hardly** keep her countenance as she assented to the hardship of such an obligation."* P: 82,

"*hardly 94.1%*" is maximally negative; it extremely reduces and negates the semantic meaning or SO of the whole sentence. Furthermore, "hardly is negative in meaning and behavior although it does not appear negative in form. Consequently, negative meaning is not always indicated by negative form" (Ding, 2013). Then, as illustrated in table (2), "*hardly*" is sharping focus.

6. *"It is **amazing** how disagreeable she found it."* P: 9

"*Amazing 98.6%*" is neutral in focus, as the adjective "*wonderful 99.0%"* is the strongest.

 7. *"My engagement to Lucy **certainly** was **foolish**"* P" 85

"*certainly foolish"* is high in force. As we see in table 3, "*foolish 92.7%"* is neutral in focus because "*idiotic 98.5%"* is the clearest and strongest. In addition,*" I was **afraid** you would think I was talking a great liberty with you"* P: 94, "afraid" is neutral in focus since "*frightened 93%"* is stronger than "*afraid 50.7%"*.

Finally, as we noticed in Figure (8), four sub-types of appraisal (*capacity, reaction-impact, tenacity, and reaction-quality*) as well as the *"effect"* type are more significant for classifying words and sentence-level in appraisal lexicons.

Hence, affirmation adverbs such as: *'absolutely'*, *'really'*, *'quite'* and negation adverbs "*never*," "*hardly* "are considered highly intensifiers "*force*" and *"focus"* adverbs in appraisal lexicons (see Table 6). On the other hand, adjectives in (Table 7) "*miserable*," "*worse*," "*rude* "are the strongest lexicons in "*force* "and "*focus* " which express positive or negative opinions about objects and people. In fact, the score of sentiment words is not accurately 100% in *Monkey Learn Sentiment Analyzer application*. Model of AL, discussed some taxonomic features which can offer useful information about how language is used to express sentiments at word and sentence-level of the novel "Sense and Sensibility".

In addition, AL helps to categorize the opinions, and whether they refer to objects, emotions, or behaviours according to the gradual meaning. Whereas the model of Dobrecu discussed some major concepts to illustrate the relationship of some concepts, especially sentiments, emotions, subjective, objective then polarity. Accordingly, in the both two models of SA that have been clarified, using AAC in sentence-level can provide with powerful effects in meaning instead of using adverbs and adjectives alone, as AAC represents the opinion as one unit of information. Moreover, we observe that adjectives are regarded as stronger lexicons than adverbs in the two models. Then, adverbs as amplifiers increase the semantic intensity of a neighbouring lexicon.

8.Conclusion

In this paper, the researchers mainly focus on the basics of SA/OM by exploiting adverbs, adjectives or AAC, based on word and sentence-level of the novel "Sense and Sensibility, which aims at establishing correlations among the various features examined. Thus, there are various models to identify sentiment from content. This paper, our models are clearly represented in analysing concepts highly concern to *sentiment analysis*. Since sentiment analysis indicates the results into positive, negative and neutral polarity and scores, computational methods have been used to extract the sentiment score. Accordingly, we based on using sentence-level to extract the sentiment value and orientation in which various aspects have applied. We have observed that the sentiment score of the lexicons is highly based on the semantic meaning. Therefore, there

are three essential types of polarity or semantic polarity: we assumed a score of (+1) shows that the adverb or adjective entirely refers to "*positive* orientation"; a score of (-1) refers to *"negative* sentiment", (+4) high positive and (-4) high negative, while a score of (0.0) implies that the lexicons and sentences are "*neutral*". Therefore, the polarity "neutral" shows that the adverb alone has no sentiment results.

Additionally, this research examines the use of appraisal categories to explore the attitudes related to SA and focuses on appraisal, in which it regarded the framework to construe the way humans express their attitudes. Appraisal system is composed of two major concepts: *force* and *focus* are conveyed by linguistic modifiers such as intensifiers (quite, really, absolutely, etc.) and the Downtowners (slightly and sort of). Besides, focus concept is also conveyed by adjectives. On the other hand, some basic concepts pertaining to SA have been investigated and analysed which clarified the orientation of the sentences, whether subjective or objective, emotion or sentiment as well as opinionated sentences. In conclusion, "Sentiment Analysis 2.0.0" application is used in analysing concepts of SA and *"MonkeyLearn Sentiment Analyzer"* application is used in appraisal lexicons. Moreover, these applications can never be accurate 100%. Finally, the adverb and the adjective play an important role in decreasing or increasing the NEG or POS opinion.

تحليل العواطف للظروف والصفات

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المستخلص

يهدف البحث إلى تحليل الآراء والعواطف والتقييمات الذاتية والموضوعية على مستوى الجملة إلى آراء إيجابيَّة وسلبيَّة باستخدام تقنية NLP (معالجة اللغات الطبيعية)، ويهدف البحث أيضًا إلى تشخيص قوة الظروف والصفات أو ما يسمَّى (ربط الصفة مع الظرف)، ويفترض البحث أنَّ (1+) هو إيجابي و (2+) أو أَكثر إِيجابيَّة بشدة وأكثر من (1‾) هو سلبي بشدة بينما (0.0) تعني أنَّ الظرف أو الصفة أو الجملة كافة حياديَّة، فضلًا عن ذلك فإنَّ البحث يوضح المنهجيات الرئيسة لتحليل العواطف والمتضمنة الطرائق الحسابية (طرائق حساب النتائج المتغيرة، تحليل العواطف 2.0.0 ومحلل العواطف MonkeyLearn)، ويناقش البحث نموذجين من نماذج تحليل العواطف ((Dobrescu, 2011 الذي يتناول المفاهيم الأساسيَّة لتحليل العواطف، أمَّا الأُنموذج الثاني فهو القواميس الذهنية للتقييم الَّتي تم استخدامها لاستخلاص "تعابير التقييم" و"مجاميع التقييم" بالاعتماد على نظرية التقييم، وبعد الانتهاء من عملية جمع العينات بدقة خَلُص الباحثون إلى أنَّ النتيجة الأبرز هي أنَّ الظروف التعزيزية منفردة ليست حاملة للعواطف على أيَّة حال فإنَّ الظروف تقوي المعاني الدلالية للصفات، ووجد الباحثون أيضًا أنَّ الصفات أقوى من الظروف في التحليل العاطفيّ، وأنَّ مصطلحي " القوة" و"التركيز" مميَّزان جدًا في تصنيف القواميس الذهنية التقييميَّة.

الكلمات المفتاحية: الآراء، تحليل العواطف، شخصي، عام، مشاعر.

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