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A Comparative Analysis Of Present And Past Participial Adjectives And Their Collocations In The Corpus Of Contemporary American English (coca)

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A COMPARATIVE ANALYSIS OF PRESENT AND PAST PARTICIPIAL ADJECTIVES AND THEIR COLLOCATIONS IN THE CORPUS OF CONTEMPORARY AMERICAN ENGLISH (COCA)

by

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ABSTRACT

ESL grammar books have lists of present and past participial adjectives based on author intuition rather than actual word frequency. In these textbooks, the *–ing* and *–ed* participial adjectives derived from transitive verbs of state and emotion are presented in pairs such as *interesting*/*interested*, *boring*/*bored*, or *surprising*/*surprised*. This present study used the Corpus of Contemporary American English http://corpus.byu.edu/coca/ (COCA) to investigate the overall frequency of participial adjectives in use as well as their frequency within certain varieties of contexts. The results have shown that among most frequently used participial adjectives there are not only the participial adjectives derived from transitive verbs of psychological state, such as *interesting/interested*, but also the participial adjectives derived from transitive verbs of action with their intransitive equivalents, such as *increasing/increased*. The data also revealed that many participial adjectives lack corresponding counterparts and thus cannot be presented in *–ing*/*-ed* or *-en* pairs (e. g., *existing*, *ongoing*, *concerned*, *supposed*). Finally, a majority of the differences between participial adjectives, including the differences between present (*-ing*) and past (*-ed* or *-en*) participial adjectives, are reflected in their collocations. This study suggests that a new approach of teaching participial adjectives along with their collocations in relation to their frequencies in particular contexts can help second language learners develop awareness of how and when these participial adjectives should be used to convey an individual's intended meaning in a native-like manner.

This work is dedicated to the memory of my father, Vladimir Shevchenko (1927-1993), who was for me the best example to follow.

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LIST OF ACRONYMS and ABBREVIATIONS

1. **COCA**: Corpus of Contemporary American English http://corpus.byu.edu/coca/
2. **EFL**: English as a Foreign Language. This refers to English taught in the countries where English is not a native language.
3. **ESL**: English as a Second Language. This refers to English taught to foreigners in English-speaking countries.
4. **ESOL**: English to Speakers of Other Languages.
5. **L1**: First Language, the native language of an individual.
6. **L2**: Second Language, the language an individual is studying, in the recent context meaning English.
7. **SLA**: Second Language Acquisition.
8. **SLL**: Second Language Learner.
9. **TESOL**: Teaching English to Speakers of Other Languages.

CHAPTER ONE: INTRODUCTION

As early as in 1974, Thomas Scovel published his article "I am interesting in English" (Scovel, 1974) in which he outlined the main problems in the use of participial adjectives by second language learners (SLLs) and emphasized the importance of the issue. Almost forty years have passed, yet the problems still remaining. In contemporary research, where the use of computerized linguistic corpora in studying lexical items is becoming more and more habitual, research on participial adjectives is still not common among the mainstream research subjects.

Recent research has aimed to bridge this gap and to present participial adjectives as a special subject of computer aided study. The tool of the current research is the Corpus of Contemporary American English (COCA) http://corpus.byu.edu/coca/ , a database containing 450,000,000 words of authentic language from 1990 to 2012. The quantity of the words is nearly equally divided into five sections of spoken, newspapers, magazines, fiction, and academic English. In the current study the sections are considered registers (spoken, academic, etc.), including the total amount of the words which constitute a neutral register. This labeling has been done to align the current research with other corpus-based studies (Biber, 2012; Biber & Conrad, 2001; Biber, Conrad, & Cortes, 2004; Biber, Conrad, & Reppen, 1996; 1999; Biber & Reppen, 2002; Conrad, 2000; Nesselhauf, 2003; Shin & Nation, 2008) where the labeling sections in linguistic corpora as 'registers' has become a tradition of a professional jargon among the researchers working with linguistic corpora.

COCA has been chosen for several reasons. First, COCA is considered to be the only simultaneously large and balanced across the sections ('registers') corpus of contemporary American English (Davies, 2010; 2011). Furthermore, COCA texts have been obtained from a

wide diversity of sources: talk shows, US newspapers across the country, popular magazines, first editions of books, and peer-reviewed journals. Also, COCA software includes a tagging system that enables researchers to separate similar morphologic forms with different functions, as in our case, to separate *-ing/-ed* participial adjectives from gerunds and verbs. Finally, COCA provides statistical measures showing not only the frequencies of linguistic items (which in the current study are the participial adjectives and the words that collocate with the adjectives), but also the strength of associations between participial adjectives and their collocations.

Statement of the Problem

The misuse of the *–ed* and *–ing* participial adjectives represents one of the main errors committed by English learners of all levels of their second language acquisition and across a wide array of first language groups (Folse, 2012; Gao, 1997; Horiguchi, 1983; Scovel, 1974; Kitzhader, 1968). A mere grammatical explanation is often not enough because it might provide either insufficient or too confusing information (Folse, 2012, Scovel, 1974). Therefore, some new ways of approaching the issue of participial adjectives are in order.

Purpose of the Study

The purpose of this study is to compare the *–ing* and *–ed* participial adjectives and their collocations using corpus linguistics, to outline some morphological, syntactic, semantic, and pragmatic associations, to examine the presentation of the present and past participial adjectives in one of the latest textbook (Reppen, 2012), and to suggest new ways of presenting the participial adjectives to English learners. The *-ing* and *–ed* participial adjectives can become less confusing for the English learners if the adjectives are taught along with their collocations in

relation to their frequencies, and presented in various contexts of the language use based on a corpus linguistics.

Research Questions

1. What are the most frequently used *–ing* and *–ed* participial adjectives in different situational contexts?
2. How do the collocations of the *–ing* and *–ed* participial adjectives reflect the specific characteristics of these adjectives?

Importance of the Study

The present study may be the first research focusing on the computerized corpus linguistics study of present and past participial adjectives, both attributive and predicative, and their collocations. Although lexical constituents have been the subject of corpus studies for more than two decades, only a very few studies mention participial adjectives (Biber et al., 1999; Biber, 2002; Bartsch, 2004; Emonds, 2001), and no one study focuses exclusively on the application of computerized corpus linguistics systems to studying the *–ing/-ed* adjective forms.

Limitations of the Study

The study was bound to one computerized corpus COCA, and thus inherited all possible limitations of this one corpus, namely its compilation of lexical items, its selection of content, its particular contexts, its organization of the material, and so on. For example, the COCA spoken section is based on radio and TV talk shows; therefore, despite the fact that mainly unscripted conversations with most characteristics of natural discourse has been used, the conversing

people's awareness of being on the air might have influenced their word choice (Davies, 2010, 2011).

In addition, the use of COCA with its automatic tagging inevitably causes some errors in numerical values; though, according to Kennedy (2003), the errors do not substantially influence the results. Moreover, some approaches to the corpus-based analyses could be questioned, such as whether frequencies of the holistically stored linguistic items are psychologically real for any individual speaker (Durant & Doherty, 2010; Mollin, 2009). Also, there are limitations in interpretation of collocations where some subjectivity is unavoidable because the co-occurrence of words is still cannot be explained adequately (either syntactically or semantically) at the larger scale of the authentic language in use (Bartsch, 2004; McCarthy & Carter, 2001).

Application

The collected information in the present study could help ESL instructors to add to the list of the *-ing*/*-ed* participial adjectives offered in the ESL books and to teach those participial adjectives that are most frequently used in contemporary American English. Also, teaching the participial adjectives along with their collocations across the variety of registers, such as neutral, spoken, academic, newspapers, magazines, and fiction would correspond to ESL/EFL students' needs, make the learning process easier, and might increase students' motivation.

The data supplied by this study can be helpful to design a curriculum. It also can be used for creating new teaching materials or new textbooks that present the use of the *–ing* and *–ed* participial adjectives and their collocations in authentic language.

Definition of Terms

1. **Collocate Node** is a main word to what a collocate belongs. Collocate is a word that co-occurs with its node forming a collocation (Bartsch, 2004; Biber & Conrad, 1999; Nesselhauf & Tschichold, 2002).
2. **Collocations** are "co-occurrence of words which cannot be characterized by structural rules alone, but is constituted in the presence of particular lexical items" (Krenn & Erbach, 1994 as cited in Bartsch, 2004, p. 47)
3. **Deep Structure and Surface Structure** are two levels of analysis of the phrase and sentence structures. "**Deep structure** is the structure generated by the phrase structure rules [of Merge operation] in accordance with the subcategorization properties of the heads" (O'Grady, Archibald, Aronoff, & Rees-Miller, 2010, p. 616). For example,

> The Merge operation is able to take a determiner such as *the* and combine it with an N' consisting of the N [noun] *house* to form the NP [noun phrase] *the house*. It is then able to take a head such as the preposition *in* and combine it with the NP the house to form the P' and PP [prepositional phrase] *in the house*. Continued application of the Merge operation to additional words can lead to the formation of phrases and sentences of unlimited complexity. (p. 164)

Surface Structure is "the structure that results from the application of whatever transformations are appropriate [Move operation] for the sentence in question (p. 637). It is "the final syntactic form of the sentence" (p. 177). Applying Move operation it is impossible to buid unlimited number of sentences "there are still many sentences that we cannot build" (p. 172). For example, Move operation transforms an existing structure by transporting "the auxiliary verb … to a new position in front of the subject" (p. 173)

4. **Frequency** is the number of items occurring in a given category http://dictionary.reference.com/browse/frequency?s=t
5. **Idiosyncratic** means "not predictable from general rules or principles" (Radford, 1988 as cited in Bartsch, 2004, p. 42).
6. **Mutual Information** (**MI**) "compares the observed number of occurrences of a word pair [O] with its expected number of occurrences [E]" (Durant & Doherty, 2010, p. 131).

$$\mathrm{MI}\ (x, y) = \log_2 \frac{O}{E}$$

The full formula of mutual information is:

$$\mathrm{MI}\ (x, y) = \log_2 \frac{f(x, y) \times N}{f(x) \times f(y)}$$

where *f(x,y)* is the number of times the collocation occurs, *f(x)* is the frequency of the participial adjective, *f(y)* is the frequency of the collocating word, *f(x)*× *f(y)* is the independent probability of the word *x* and the words *y* of occurrence, *N* is the sample size (Bartsch, 2004; Kennedy, 2003).

7. **Paradigmatic** means pertaining to a relationship among linguistic elements that can substitute for each other in a given context, as the relationship of *sun* in *The sun is shining* to other nouns, as *moon*, *star*, or *light*, that could substitute for it in that sentence, or of *is shining* to *was shining*, *shone*, will *shine*, etc., as well as to *is rising*, *is setting*, etc. Compare **syntagmatic.** http://dictionary.reference.com/browse/paradigmatic
8. **Participial Adjectives** are "non-finite verb forms that function as adjectives" (Gao, 1997, p. 3)
9. **Register** is "any language variety in situational terms" (Biber, Conrad, Reppen, Burd, & Helt, 2002, p. 10). According to Conrad (2000), the reason of considering the concept of

register in situational terms is in the fact that "corpus research has shown that consistent, important differences also occur across varieties within standard English—most notably across registers, varieties determined by their purposes and situations for use (e.g., fiction writing vs. academic prose vs. newspaper writing)" (p. 549). Therefore, in the current study the term 'register' has been applied according to the situational use of the language in six sections specified in COCA (general, spoken, fiction, magazines, newspapers, and academic).

10. **Saliency** (adj. **Salient**) is the importance of the perceived element of input (Brown, 2007, p. 389).
11. **Surface Structure —** see **Deep Structure**
12. **Syntagmatic** means that one linguistic unit selects the other linguistic unit either to precede it or to follow it. For example, the definitive article *the* selects a noun and not a verb, which follows the noun: *the sun is shining*. Syntagmatic structure in a language is a surface structure—the combination of words according to the rules of syntax for that language. Compare **paradigmatic.** http://dictionary.reference.com/browse/syntagmatic
13. **t-score** is frequency-based measure of statistical significance of collocations:

$$\mathrm{t_{score}} = \frac{O - E}{\sqrt{O}}$$

where *O* is the observed frequency of occurrence of the collocation, *E* is the expected frequency of occurrence "on the null hypothesis that there is no relationship between the words" (Durrant & Doherty, 2010, p. 130),

$$E = \frac{f(\mathrm{x})}{N} \times \frac{f(\mathrm{y})}{N} \times N$$

$$P(x) = \frac{f(\mathrm{x})}{N}; \qquad P(y) = \frac{f(\mathrm{y})}{N}; \qquad P(xy) = P(x) \times P(y)$$

14. **Token** “refers to every occurrence of the same word. Word type refers to all occurrences of the same word counted as one. To put it differently, types are all of the different words. For example, if *cat* [-*ing* participial adjective] occurs 10 times in a corpus, we have 10 *cat* [-*ing* participial adjective] tokens of one type” (Laufer & Waldman, 2011, p. 667).

CHAPTER TWO: LITERATURE REVIEW

General Overview of Previous Studies of the Participial Adjectives

Definition of participial adjectives.

English participial adjectives belong to the adjectival word class and, at the same time, are derivatives of verbs (Folse, 2012; Gao, 1997). English participial adjectives can be defined as "non-finite verb forms that function as adjectives" (Gao, 1997, p. 3). The labeling of the participial adjectives depends on the tense of the verbs they are derived from. The present adjectival participles are labeled as the *–ing* forms, and the past adjectival participles—either as the *–en* forms (Kitzhader, 1998; Gao, 1997) which refers to the past participle suffix only, or, as in traditional grammar,—the *-ed* forms (Borer, 1990; Folse, 2012; Gao, 1997; Scovel, 1974). The participial adjectives have been the subject of studies in terms of their morphological, syntactic, semantic, pragmatic, and lexical properties, as well as the subject of corpus-based research. Nevertheless, the present corpus linguistics study focusing exclusively on the present and past participial adjectives and their collocations has not been conducted.

Pre-Corpus studies of participial adjectives.

A comparative analysis of the *–ing* and *–ed* participial adjectives is often based on case grammar analyses of students' systematic patterns of errors (Brekke, 1988; Borer, 1990; Folse, 2012; Gao, 1997; Horiguchi, 1983; Kitzhader, 1998; Scovel, 1974). Within the framework of the analyses, a number of properties of the participial adjectives is considered. Thus, there are the morphological differences of the present participle *–ing* form and the past participle the *-ed*/*-en* forms. Also the differences between the grammatical categories of the verbs the participial

adjectives were derived from are considered: first—whether the verbs were transitive (e.g. *It interests me*) or transitive with intransitive equivalents (*He is boiling water*. *It has been boiling for two hours*), and second—whether the verbs were of action (*boil*) or state (*interest*). Furthermore, the grammatical categories of the participial adjectives have been taken into consideration—whether they are the "true" adjectives that take any modifiers (e.g. *very interesting*/*interested*) or "non-true" adjectives indicating a change of state (*boiling*/*boiled*) (Brekke, 1988; Borer, 1990; Gao, 1997; Kitzhader, 1998; Scovel, 1974).

In addition to the morphological differences there is a set of semantic differences between the *–ing* and *–ed* participial adjectives that has been analyzed in several modes. First, the differences are presented in terms of thematic roles. Thus, in the case of the *–ing* participial adjectives derived from transitive verbs of state, "the subject or agent creates a state for an object or goal" (Scovel, 1974, p. 310) (e.g. *His stories are very interesting/disappointing* [*for students*]) Here *he* (or *his stories*) creates the state of interest/disappointment. Conversely, the *–ed* form of the participial adjectives indicates that the subject is a recipient of the state aroused by the object (e.g. *He is interested/disappointed* [*in the book*]). In the other case,—the case of the participial adjectives derived from transitive action verbs with intransitive equivalents, the *–ing* participial adjectives are signaling an on-going activity, while the *–ed* forms mean resultant activity (Brekke, 1988; Borer, 1990; Folse, 2012; Gao, 1997; Scovel, 1974).

Second, the analyses of the *–ing* and/or *–ed* participial adjectives in terms of deep and surface structures have shown the double appearance of "non-true" participial adjectives as adjectives in the surface structure and as verbs in their deep structure, while the true participial adjectives are adjectives in the surface as well as in the deep structure (Emonds, 1991; Gao, 1997; Horiguchi, 1983; Kitzhader, 1998). As Emonds (1991) has argued that true participial

adjectives "results from an intrinsic feature of the verbal head" (p. 122) which is psychological, in contrast with the feature of activity of the verbal head of "non-true" participial adjectives.

Corpus-based studies of participial adjectives.

Corpus-based studies of lexical and syntactic categories have been of growing popularity during the last several decades; nonetheless, the comparative characteristics of the present and past participial adjectives have not been the specific subject of any particular corpus-based research. Among all the varieties of studied lexical categories, only a few papers mention participial adjectives, and no one focuses exclusively on the application of corpus linguistics to the comparison of the *–ing*/*-ed* adjectival forms. Thus, Kennedy (2003) mentions the *–ing* and *–ed* participial adjectives while studying the semantic associations by comparing the frequencies of the use of adverbial modifiers such as *really*, *perfectly*, *severely*, *highly*, etc. with the variety of adjectives. In this research the *–ing*, *-ed* participial adjectives were the subjects of the study along with the *–y*, *-able*, *-ible*, *-ive*, *-ful*, and *-ous* adjectival forms in terms of what percentage of certain adjectives collocates with particular adverbial modifiers. For example, the researcher has pointed out that the adverb *perfectly* has semantically positive associations and collocates with the adjectives ending in *–able* and *–ible* (28%), and those ending in *–ed* (18%); the adverb *badly* is semantically associated with the verb *damage*, and 88% of modified adjectives ends in *–ed*; the adverb *really* has positive and negative semantic associations and collocates with the *–y* adjectives (25%), *-ed* adjectives (15%), and *–ing* adjectives (13%).

Other studies (Bartsch, 2004; Biber, Conrad, Reppen, Byrd, & Helt, 1999; Biber & Reppen, 2002; Emonds, 2001; Siyanova & Schmitt, 2008), analyze the frequencies of adjectives in general and their collocations along with other lexical and syntactic categories (nouns, lexical verbs, tenses, aspects) across some registers (conversation, fiction, news, academic) using

linguistic corpora and comparing the results with the presentation of the linguistic categories in textbooks. In these works the frequencies of some adjectives such as common adjectives, *-ing* adjectives, and *–ed* adjectives have been considered in terms of increasing the meaningful input as it provided to the ESLs through textbooks. Nevertheless, no comparative analyses of the *–ing* and *–ed* participial adjectives have been conducted. One more particular aspect of some studies is worth pointing out. Thus, in the study comparing lexical items found in textbooks and most frequent lexical items in a corpus linguistic (Biber & Reppen, 2002), among the participial adjectives only attributive (but not predicative) adjectives have been considered (e.g., *an exciting game, an interested couple*, p. 202, but not the participial adjectives in such constructions as *the game was exciting* or *the couple was interested*).

In addition, past participle adjectives alone (without their present participle adjectival counterparts) have been considered in terms of their collocation with nouns and adverbial modifiers (Bartsch, 2004). The author has distinguished the structures with obligatory modifiers (e.g. *the newly created department*, but not **the created department* (p. 181)), and non-obligatory modifiers (e.g. *an openly declared policy* and *a declared policy* (p. 182)). The distinction has been attributed to intrinsic properties of noun heads (in the given examples the heads are the nouns *department* and *policy*).

Difficulties in the Use of the *–ing* and *–ed* Participial Adjectives

The difficulties in learning and understanding participial adjectives begin with the fact that adjectives in general, as a word class, are less salient to second language learners in comparison with nouns and verbs (Schmitt & Zimmerman, 2002). The researchers examined the knowledge of four main word classes— nouns, verbs, adjectives, and adverbs including their derivatives by the university students—106 nonnative language learners of advanced levels and

36 native speakers of English. To evaluate students' knowledge the researchers used two instruments: Test of Academic Lexicon where the participants self-identified four levels of their knowledge and the writing of the sentence in which the participants had to exemplify the meaning of the word. The results have shown that SLLs demonstrated the following accuracy of production: verbs were correctly produced at the rates of 67%, nouns—of 63%, adjectives—of 54%, and adverbs—of 52%.

During the experiment, another aspect of word perception—the knowledge of derivatives of the root words already marked as known—was examined. The derivatives caused some difficulties even for native speakers: they produced the correct derivatives at 93% (nouns), 89% (verbs), 90% (adjectives), and 92% (adverbs). Second language learners were able to produce correct derivatives at the lower rates of 75% (nouns), 77% (verbs), 62% (adjectives), and 60% (adverbs) [each number represents the mean of three different groups of the SLLs; in the source each group is counted separately].

The fact that the participial adjectives do not belong only to this problematic adjectival class, but also are derived from verbs causes extra learning problems. The use of the *–ing* and *–ed* participial adjectives by SLLs is problematic even at advanced levels of learners' second language acquisition (Borer, 1990; Folse, 2012; Gao, 1997; Horiguchi, 1983; Kitzhader, 1998; Scovel, 1974). The special difficulties are caused by the variety of reasons: by multiple syntactic functions of the *–ing* and *–ed* verb forms with the apparent similarity of their surface structures, by morphological uniqueness of the *–ing* / *-ed* participial adjectives in comparison with other adjectives, by their semantic diversity, by interference with the English learners' native language.

Multiple functions of the *–ing* and *–ed* verb forms.

One of the difficulties of internalizing the *–ing* and *–ed* verb forms by SLLs is the fact that these forms have multiple syntactic functions: they can function as nouns, verbs, and adjectives (Borer, 1990; Brekke, 1988; Emonds, 1991; Folse, 2012; Gao, 1997; Scovel, 1974).

–ing verb forms can be used as

- nouns (e. g., *Jumping from the cliff can be dangerous*.),
- transitive verbs (*She is boiling the water. The movie was thrilling the audience.),*
- intransitive verbs (*The water is boiling. We are jumping.).*
- adjectives (*English is interesting. It is boiling water. The movie was thrilling.*),

–ed verb forms can be used as

- adjectives (e. g., *It is boiled water. The water is boiled. I am bored. The disappointed students left.*),
- transitive verbs (*He boiled the water. He disappointed the students.*),
- intransitive verbs: (*The kettle boiled, and he filled the teapot*.).

This apparent similarity of morphological structures causes difficulties in the usage of the *–ing* and *–ed* verb forms by English learners. The mere grammatical explanation is often not enough: it might provide either insufficient or too confusing information (Folse, 2012; Horiguchi, 1983; Scovel, 1974). Thus, the core explanation that the *–ing* form is for the person or thing that causes the action and the *–ed* form (or any past participle ending) is for the person or thing that receives the action and that the participial adjectives are derived from the transitive verbs is not sufficient in the number of cases due to the morphological uniqueness of the *–ing* and *–ed* participial adjectives.

Morphological uniqueness of the *–ing* and *–ed* participial adjectives.

The *–ing* and *–ed* participial adjectives reveal themselves as unique morphological forms:

1. when transitive verbs overlap with participial adjectives (e. g., *The movie was thrill**ing** the audience* versus *The movie was thrill**ing***) (Scovel, 1974);
2. when "true" participial adjectives (those that can be qualified by the adverbs of degree—*very*, *quite*, and *rather*; for example, *It was quite bor**ing***) are contrasted with "non-true" adjectives (those which cannot be qualified, **The horse is quite jump**ing***) (Borer, 1990; Brekke, 1988; Scovel, 1974);
3. when the "true" *–ing* and *–ed* participial adjectives are not directly related to the transitive verbs from which they have been derived and have no passive form with animate nouns (*He is very exact**ing*** versus **His students were exact**ed***) (Scovel, 1974);
4. when the surface structures of the transitive verbs with adjectival equivalents and the transitive verbs with intransitive equivalents, which are seemingly the same, are contrasted with their deep structures, which are different (*It is an interes**ting*** [adj] *point* and *I am interest**ed*** [adj] *in English* versus *It is boil**ing*** [adj] *water* and *It is boi**led*** [verb] *in a tin pot*) (Borer, 1990; Brekke, 1988; Scovel, 1974).

The differences between the two sentences with the same surface structure, but different deep structures are due to the fact that transitive verbs indicating psychological states (e. g., *interest*) and requiring animate direct objects (e. g., *It interests me*) can be systematically transformed into adjectives by adding *–ing* (Chomsky, 1957 as cited in Emonds, 1991, p. 121); moreover, these *-ing* participial adjectives can be paired with their *–ed* counterparts (e. g., *interesting-interested*) (Scovel, 1974).

Semantic features of the *–ing* and *–ed* participial adjectives.

The following semantic features that can cause difficulties have to be pointed out:

1. the "true" *–ing/ -ed* participial adjectives tend to indicate psychological **states**, while the *–ing/ -ed* participial adjectives derived from the transitive verbs with intransitive equivalents indicate **events** implying a change of state (e. g., *interest**ing** events* versus *boil**ing** water*; *interest**ed** students* versus *boil**ed** water*) (Borer, 1990; Brekke, 1988; Emonds, 1991; Scovel, 1974);
2. the "true" *-ing/-ed* adjectives derived from transitive verbs imply completely different meanings (*He is bor**ing*** versus *He is bor**ed***), while the *–ing/-ed* participial adjectives derived from the transitive verbs with intransitive equivalents have fairly similar meaning with the distinction depending on whether or not the event was completed (e. g., *boil**ing** water* versus *boil**ed** water*; *advanc**ing** technologies* versus *advanc**ed** technologies*) (Scovel, 1974).

As can be seen, the semantic issue of meaning of the *–ing/-ed* participial adjectives is very complex; moreover, some of its points may even be defined as unexplainable to English learners in traditional ways. Scovel (1974) has described the presence of the intuitive element in the use of participial adjectives in two following instances:

> Evidence for this distinction between 'state' adjectives and 'eventive' intransitive verbs comes from the feeling native speakers of English express that the adjectival participles can be qualified but that the *–ing* forms of the intransitive verbs cannot; the latter are simply binary … To confound the issue even further, there is another factor involved which I cannot explain completely. It is highly unusual to use the *–ing* adjective pattern with the first person. (p.p. 309-311)

Interference with native languages.

The syntactic differences between English and SLLs' native languages contribute to the misuse of the *–ing* and *–ed* participial adjectives. Contrastive analysis shows that some languages do not have the preceding verb *to be*, such as Thai (Scovel, 1974), Arabic, Chinese, Japanese, Korean, Russian (Folse, 2012). Furthermore, some languages don't have the suffix *–ed* in passive voice and/or the combinations of past participles with prepositions. Therefore, for example, according to Scovel (1974), while interfering with Thai grammatical pattern, the structure of the sentence *I am interested in this book* produced by the English learners may be "*I interest this book*" (p. 306).

By parity of reasoning, some research on interpretation of *–ing* and *–ed* verbs by non-native speakers should be mentioned. A study by Al-Hamad et al. (2002) compared the use of the *–ing* and *–ed* verbs by advanced non-native speakers of Chinese, Japanese, French, Arabic, German, and Spanish with the use of the verbs by native speakers of English. The results have suggested that the nature of tense and aspect representation in a speaker's L1 can affect their representation of the *–ing* and *–ed* English verbs. As, for example, Chinese speakers whose L1 does not have grammatical tense features "do not accept appropriate uses of continuous forms…like *As Simon's taxi pulls up…the train is already arriving…*, and they do not reject inappropriate simple past tense forms like *As Simon's taxi pulled up…the train already arrived*" (p. 60).

Corpus-Based Approach to Studying Linguistic Forms

The importance of corpus-based studies was recognized long before the computer age. In the field of creating dictionaries the corpus-based approach has been known since the 1700s. At the early times the word collecting was being performed by voluntaries using citations from the

varieties of texts (Biber, Conrad, & Reppen, 1998). Some early corpus studies not related to dictionaries but instead representing grammatical features were done in the early to –mid 1900s. In the completed studies the frequencies of nouns, verbs, adjectives, and other word classes were quantified. Since the 1930s the groups of words as collocations have been studied in terms of second language acquisition (Kennedy, 2003). Although only written texts of various genres (fiction, drama, critical essays, biographies, periodicals, etc.) were used at that time, a corpus of spoken language was also created by utilizing the literature material presenting conversations (Glisan & Drescher, 1993). Nevertheless, spoken language was not commonly presented in linguistic corpora until the 1970s (Biber, Conrad, & Reppen, 1998).

In the early 1960s the Brown University Standard Corpus of Present-Day American English was created, which is considered to be the first computerized corpus linguistics; however, in the 60s the importance of using corpus in applied linguistics was doubted due to association with behaviourism and Audio-Lingual Method (Biber & Reppen, 2002) after Chomsky's criticism of corpus-based approaches as modeling on performance and overlooking competence (Kennedy, 2003). Since then only in the 1980s with the development of computers and network technology did corpus linguistics undergo its revival.

Over the last two decades, corpus-based studies examining language in use with classroom applications have become quite the norm (Biber, 2009, 2012; Biber, Conrad, & Cortes, 2004; Biber, Conrad, & Reppen, 1996; Biber, Conrad, & Reppen, 1998; Biber, Conrad, Reppen, Byrd, & Finnega, 1999; Biber & Reppen, 2002; Conrad, 2000, 2002; Durrant & Schmitt, 2012; Kennedy, 2003; McCarthy, 2001; McGee, 2009; Nation, 2004; Nesselhauf, 2003; Nesselhauf & Tschichold, 2002; Schmitt & Zimmerman, 2002; Shin & Nation, 2008; Sianova & Schmitt, 2008; Walker, 2011; Webb & Kagimoto, 2009, 2011; Wolter, 2006). Computer-aided

corpus studies are providing an opportunity to use the results of quantitative analysis showing the frequencies of linguistic items as used in authentic language. The results proved "the unreliability of intuitions about use… Teachers… rely on their intuitions to choose the most important words … to focus on. However, corpus studies show that such intuitions about use are often incorrect." (Biber & Conrad, 2001, p. 332). This corpus-based research also allowed studying the nature of collocations in depth (Kennedy, 2003; Bartsch, 2004; Kennedy, 2003; Nesselhauf, 2003; Tohidian, 2009; Walker, 2011; Webb & Kagimoto, 2009, 2011).

However, among all the array of studied lexical constituents, only a few studies mention participial adjectives (Biber et al., 1999; Biber, 2002; Bartsch, 2004; Emonds, 2001), and no one study focuses exclusively on the application of corpus linguistics to study the *–ing/-ed* adjective forms.

While researching language in use via corpus linguistics, three important aspects should be taken into account: frequencies, registers, and collocations (Bahns & Eldaw, 1993; Bartsch, 2004; Biber & Conrad, 2001; Biber, Conrad & Reppen 1996; Biber & Reppen, 2002; Kennedy, 2003; Nesselhauf, 2003; Walker, 2011;).

Importance of frequency.

Frequency can be of two types: total and normalized. Total frequency considers occurrences per any particular corpus linguistics—a book, an article, a corpus of spoken language, etc. Normalized frequency means that total frequency has been normalized to a common basis—recounted per 1 million words. Both types are used to characterize words and syntactic units (constituents) in linguistic corpora, yet normalized frequencies allow direct comparisons of the frequencies across various studies as well as across registers (Biber & Repen, 2002).

Frequencies are particularly important for presenting lexical and syntactic categories. Human intuition concerning the frequency of the use of lexical items has often proved to be wrong (Biber & Conrad, 2001; Biber, Conrad, & Cortes, 2004; Biber, Conrad, & Reppen, 1996; McCarthy, 2006; McGee, 2009; Shin & Nation, 2008). Even before the computerized approach to studying lexical items, the importance of frequencies had been emphasized (McCarthy, 1984). Dubbed the "empirical basis" (Biber & Repen, 2002, p. 200), frequencies are crucial for compiling dictionaries and creating textbooks. According to Biber and Reppen (2002) as well as Glisan and Drescher, (1993), textbooks, especially those for intermediate and advanced levels, do not reflect the real world of language. Some of these studies (Biber & Reppen, 2002) have revealed, for example, that nouns as attributive adjectives are extremely frequent in newspaper writing; nevertheless, the nouns as adjectives were covered only in one of six textbooks the researchers surveyed.

Importance of registers.

In the current study, register is defined according to the situational use of lexical items in six sections specified in COCA (general, spoken, fiction, magazines, newspapers, and academic). The situational rather than linguistic approach is used to characterize an authentic language in use in the corpus-based studies (Biber, Conrad, & Reppen, 1996, 1999; Biber, Conrad, Reppen, Burd, & Helt, 2002). As stated by Biber et al. (2002), register is "any language variety in situational terms" (p. 10). According to Conrad (2000), the reason of considering the concept of register in situational terms is in the fact that "corpus research has shown that consistent, important differences also occur across varieties within standard English—most notably across registers, varieties determined by their purposes and situations for use (e.g., fiction writing vs. academic prose vs. newspaper writing)" (p. 549). Therefore, in the current study the labeling of

the situational varieties of standard English ('sections' in COCA) as 'registers' has been done to bring the presentation in correspondence with other corpus-based studies, such as Biber (2012), Biber and Conrad (2001), Biber, Conrad, and Cortes(2004), Biber, Conrad, and Reppen (1996, 1998), Biber and Reppen (2002), Conrad (2000, 2002) where the labeling sections in linguistic corpora as 'registers' has become a tradition of a professional jargon among the researchers working with linguistic corpora. For example, the following varieties of language in use are considered 'registers' in corpus-based studies: "fiction register, academic register" (Biber, Conrad & Reppen, 1998, p. 98), "news register, fiction register, drama register" (p. 208), "conversation register, fiction register, newspapers register, academic prose register" (Conrad, 2002, p. 79).

The importance of registers has been emphasized by Biber and Conrad (2001); according to these researchers, a register can be the central aspect in teaching second language. Although the concept of 'neutral,' or generalized, register is used in textbooks to represent the summarized use of language of 'neutral' register (Reppen, 2012), researchers do not usually stop at this point (Biber, 2012; Biber, Conrad, & Cortes, 2004; Biber & Reppen, 2002; Biber & Conrad, 2001; Biber, Conrad, & Reppen, 1996, 1998; Conrad, 2000; Shin & Nation, 2008), but provide comparative data of language use across registers because "strong patterns of use in one register often represent only weak patterns in other registers" (Biber & Conrad, 2001, p. 332).

Studies have shown that frequencies of language components at all linguistic levels vary across registers. The disparities are seen among the number of specific language components, such as lexical variations of seemingly synonymous words (Biber, Conrad, & Reppen, 1996, 1998); attributive adjectives: common, participial, and noun adjectives (Biber & Reppen, 2002); aspects: simple, progressive, and perfect aspects (Biber & Conrad, 2001); grammatical

variations, such as *that*-clause versus *to*-clause, verb-phrase with non-passive voice versus verb-phrase with passive verb, the use of *got + verb* combination, and so on (Barber, Conrad, & Cortes, 2004; Biber, Conrad, & Reppen, 1996, 1998; Conrad, 2002; McCarthy, 2006); variations of synonymous degree adverbs with adjectives (Biber, et al., 1999).

For example, according to Biber, Conrad, and Reppen (1998), the frequencies of adjectives marking "*certainty*"—*certain*, *sure*, and *definite* in "neutral" register (all words in the corpus)—were distributed differently in the London/Lancaster Corpus of written texts in comparison with the same adjectives of the same corpus across two registers—social science and fiction. (All frequencies were normalized per 1 million words of text.) Thus, in the neutral register, the most frequent adjective was *certain* (259.0), then—*sure* (234.0), and finally—*definite* (34.9). In the text category of social science, the most frequent adjective was, again, *certain* (358.7), but then went *definite* (114.2), and the least frequent was *sure* (73.8). In fiction, the first adjective was *sure* (353.1), the second—*certain* (178.5), and the last—*definite* (10.8).

Consequently, corpus linguistic studies of linguistic and syntactic categories have provided certain opportunities to revise ESL textbooks. Before the corpus computer-based linguistic studies, the sequence of the bits of textbook information, which is supposed to be from the most typical and common categories to more complex and specialized, had been organized intuitively. Thus, the language in use based on the quantitative data of actual frequencies and on the situational context reflected in the varieties of frequencies across registers had not been reflected. This empirical description of language in use is resulting in fundamental changes in the ways of organizing the material in textbooks (Biber & Conrad, 2001; Biber, Conrad, & Cortes, 2004; Biber, Conrad, & Reppen, 1996, 1998; Biber & Reppen, 2002; Conrad, 2000; Nesselhauf & Tschichold, 2002).

Importance of collocations.

> *You shall know a word by the company it keeps* [italics added] (Firth, 1957, as cited in Kennedy, 2003, p. 468).

Collocations can be defined in several ways. At the beginning of the 20th century, the notion of idiom had been analogous to the notion of collocation until the 1930s when Palmer (1933) discerned the differences of the two concepts by defining the term collocation as "a succession of two or more words that must be learned as an integral whole and not pieced together from its component parts" (as cited in Kennedy, 2003, p. 468). Some of the researchers considered the randomness of the collocational co-occurrences to be the intrinsic feature of collocations. Thus, Lewis (1997) stated that "collocation is an arbitrary linguistic phenomenon" (as cited in Walker, 2011, p. 291).

Nevertheless, nowadays collocations are not considered as entirely free word combinations, but as having certain restrictions in their organizational variations. Therefore, collocations are now defined as "concurrences of words in a certain span" (Nesselhauf, 2003, p. 224), "frequently recurrent, relatively fixed syntagmatic combinations of two or more words" (Bartsch, 2004, p. 11), "co-occurrence of words which cannot be characterized by structural rules alone, but is constituted in the presence of particular lexical items" (Krenn & Erbach as cited in Bartsch, 2004, p. 47). Furthermore, the psychological (Mollin, 2009; Siyanova & Schmitt, 2009), or so-called neo-Firthian approach (Durrant & Doherty, 2010; Durrant & Schmitt, 2010), adds psychological interpretations to the phenomenon of collocations and defines collocations as the "words that appear together more frequently than their individual frequencies would lead us to expect" (Sinclair, 1991; Stubbs, 1995; Hoey, 2005 as cited in Durrant & Schmitt, 2010, p.164), or as "sequences of words or terms that co-occur more often than would be expected by chance" (Tohidian, 2009, p. 1, [Review of O'Dell & McCarthy, 2008]).

The analysis of collocations offers the opportunity to explore new, non-traditional ways of learning a language. Thus, according to McCarthy (1984) and Sinclair (1991) as cited in Kennedy (2003), the study of collocations reveals the necessity of moving from traditional syntax-based approaches in second language learning towards lexicalization. The lexical rules of co-selection of certain words have been supposed to be not less important factor of linguistic organization than the combination of syntactic and semantic rules (Bahns & Eldaw, 1993; Bartsch, 2004; Durrant & Doherty, 2010; Kennedy, 2003; McCarthy, 1984; Nesselhauf, 2003; Nesselhauf & Tschichold, 2002). For example, a study of adjectival collocations of 24 amplifiers such as *very*, *particularly*, *extremely*, *deeply* based on the 100-million-word British National Corpus (Kennedy, 2003) has showed that some collocations are not interchangeable, though they appear to be synonymous, "someone might become *highly* (rather than *heavily*) *skilled*; one is more likely to be *incredibly lucky* than *highly lucky*; and so on" (p. 481). According to the researcher, the reason for some amplifiers not being compatible with particular adjectives can be found in lexical co-selection: these unfitting amplifier-adjective juxtapositions are not accepted by most native speakers of English as well are not found in a corpus. Some studies have also proved that English learners' knowledge of collocations correlates with their general proficiency level in English (Keshavarz & Salimi, 2007; Laufer & Waldman, 2011).

Also, the semantic properties of the participial adjectives can be revealed through the study of their collocations. Thus, the analysis of semantic relation of the participial adjectives to the head nouns has shown that the meaning of the adjectives cannot overlap with the intrinsic meaning of a head noun (e.g. *a misleading account*, but not *a leading account*; *a new born child*, but not *a born child* Bartsch, 2004, p.p. 179-181).

Furthermore, collocations can shed light on the pragmatic aspect of a language (Biber, 2009; Biber, 2012; Durrant & Doherty, 2010; Kennedy, 2003; McCarthy, 1984) by clarifying for English learners the "situational context" (Firth, 1957 as cited in Kennedy, 2003, p. 468). According to McCarthy (1984), collocations should be considered in the context of the discourse, and language educators need "to know more about … the pragmatic potential of the types of lexical reiteration and their relation to pro-forms across boundaries such as those manifested in common conversational phenomena" (p. 15). Thus, because certain collocations belong to particular registers, they convey nuances of specific domains of a language (Bartsch, 2004), for example, *to temper steel*, *a hung parliament* (p. 177). Moreover, because collocations originate from cultural milieu of linguistic communities, they convey the communities' stereotypes (e. g. *age of consent*, *affirmative action*, p. 177).

Additionally, from a pragmatic perspective, collocations are indicators of native naturalness of a linguistic discourse, and the naturalness can be affected by the interference of L1 pragmatic rules, which makes awareness of collocations indispensable (Bahns, 1993; Bartsch, 2004; Laufer & Waldman, 2011; Nesselhauf, 2003; Webb & Kagimoto, 2011; Wolter, 2006, and Wolter & Gyllstad, 2011). For example, according to Nesselhauf, 2003, the results of the study of 32 essays written by native speakers of German have shown that the advanced learners of English as a second language had difficulties producing collocations, even though the meaning of collocations was clearly understood. The researcher attributes the difficulties in the use of collocations to German language interference: in the use of those English collocations that were congruent with German ones the percentage of mistakes was 11%, while in the use on non-congruent collocations the percentage of mistakes rose to 42%.

The pragmatic aspect of collocations also means that collocations cannot be a subject of quantitative analysis only. According to Bartsch (2004), McCarthy and Carter (2001), Mollin (2009) as well as Walker (2011) integrated approach combining quantitative and qualitative analyses while considering collocations in their contexts has to take place. The qualitative descriptive linguistic analysis of collocations has to be incorporated because collocations function not only within the structure of syntactic and semantic relations, but in the whole system of the discourse. Moreover, the pure quantitative analysis considering exclusively holistic approach in storing linguistic items in corpora does not take into consideration the individual linguistic experience of a particular speaker (Durrant & Doherty, 2010; Mollin, 2009), so it is not clear if "corpus analysis would be psychologically real for any individual speaker" (Durrant & Doherty, 2010, p.127). Therefore, if quantitative analyses are indispensable in identification of typical lexical co-occurrences on the large scale of authentic language data, qualitative analyses allow revealing syntactic, semantic, and pragmatic properties of collocations in smaller instances of lexical discourse.

The Teaching Implications in Previous Studies

General principles in teaching participial adjectives.

Most educators agree that while teaching present and past participial adjectives the emphasis should be placed on their form (-*ing* form versus –*ed*, or-*en*, form) and its function in noun phrases (the -*ing* forms modify the noun/pronoun causing the action, and the –*ed*, or –*en*, forms modify the noun/pronoun receiving the action). However, the educators and researchers also agree that focusing solely on these two aspects is not enough (Folse, 2012; Gao, 1997; Horiguchi, 1983; Kitzhader, 1998; Scovel, 1974).

Thus, according to Gao (1997) the emphasis should be made on contrasting meanings between the *–ing* and *–ed* participial adjectives of related pairs while applying the interpretation of the degree of vividness: the *–ing* participial adjectives are considered as more vivid, meaning the ongoing event activity, while the *–ed* participial adjectives—less vivid, meaning the resultant state. What's more, is that while teaching to the ELLs the perplexing issue of the distinction between the participial adjectives derived from transitive verbs (e.g., *interesting/interested*) and the participial adjectives derived from the transitive verbs with intransitive equivalents (e.g., *jumping/jumped*), some authors, such as Borer (1990), Brekke (1988), Horiguchi (1983), Kitzhader (1968), Scovel (1974), suggest that this issue should be taught within the framework of the "true" and "non-true" participial adjectives where the "true" participial adjectives can take the adverbial modifiers of degree, while the "non-true" ones cannot (e.g., *a very interesting book* versus **a very jumping cow*). These authors also consider the necessity to highlight the difference in meaning between the *–ing* and *–ed* participial adjectives derived from transitive verbs with intransitive equivalents by explaining to the ELLs that in this case the *–ing* adjectival forms mean an action in the process, while the *–ed* adjectival forms—an action having come to its end (e.g., *developing countries* versus *developed countries*). Moreover, it is necessary to emphasize that the *–ing* participial adjectives can become parts of compound nouns (e.g., *washing machine, melting point, laughing gas, baking powder*) and these two words should be taught as one concept (Kitzhader, 1968).

In addition, it is worth to mention that in a teaching process all adjectives in general, as a lexical category, and especially participial adjectives, have to be emphasized in explicit instruction. As it has been mentioned, according to Schmitt & Zimmerman (2002), adjectival forms are one of the least noticeable lexical categories by SLLs; moreover, all derivative forms

cause some difficulties even for native speakers. Therefore, participial adjectives that represent adjectival forms derived from verbs are one of the least likely word categories to be learned by the SLLs easily and have to be given special attention.

Role of collocations in teaching participial adjectives as part of vocabulary.

Corpus linguistic studies have empowered educators with valuable information concerning language in use. New findings such as statistics on frequencies of the use of words and their collocations, the data concerning the use of linguistic categories across different registers, and the patterns of lexical co-selections (collocations) have moved second language teaching to a new level—from focusing mostly on grammar rules towards lexicalization while exposing the ELLs according to their needs to all the linguistic diversity of situational contexts across registers. Although specific corpus-based studies of the present and past participial adjectives haven't been conducted, some new approaches concerning teaching second language while considering the results of corpus linguistic research are taking place.

The introduction of the collocations of the target words in terms of their pragmatic functions is considered to be an apposite approach in teaching vocabulary (Biber, Conrad, & Cortes, 2004; Biber, Conrad, & Reppen, 1998; McCarthy, 1984). Thus, the vocabulary is suggested to be taught while examining "the syntagmatic and paradigmatic relations of collocation and set between lexical items a) above sentence-level, b) across conversational turn-boundaries, and c) within the broad framework of discourse organization" (McCarthy, 1984, p. 14).

Criteria in choosing collocations to teach.

Some criteria in choosing what collocations to teach among the excessive amount of collocations in use have been suggested. Thus, the main criterion may be the efficacy for the ELLs. This usefulness is reflected in the frequencies of collocations (Biber, 2009; Biber, Conrad,& Cortes, 2004; Shin & Nation, 2008) as well as in combined frequencies of the collocations in a neutral register and in any specific registers applicable to the particular students' needs (Nation, 2004; Nesselhauf, 2003; Web & Kagimoto, 2011). Furthermore, according to Bartsch (2004) and Kennedy (2003), the importance of frequencies in second language learning have been supported by psycholinguistic experiments which have shown intuitive perception of frequencies by language users. Plus, Biber and Reppen (2002) have pointed out that frequency is one of the main occurrences to what language learners naturally pay attention. As McCarthy (2006) described the beneficial function of using frequency-based instruction, "The point…is not what can be said, but what is routinely said" (p. 33).

In addition, Nesselhauf (2003) has pointed out that, while teaching collocations, the entire linguistic structure of most frequent collocations, including lexical as well as functional categories, such as prepositions, determiners, conjunctions should be taught holistically. The necessity of teaching past participial adjectives along with their prepositions has also been emphasized by Folse (2012) because "there is no way to predict which preposition is used with which adjective" (p. 247).

Another criterion for choosing which collocations to teach is the congruence of the L1 collocations with the collocations of the target language (L2). Thus, Bahns (1993), Durrant and Schmitt (2009, 2010), Laufer and Waldman (2011), Liu (2010), Nesselhauf (2003), Web and Kagimoto (2011), Wolter (2006), Wolter and Gyllstad (2011), and Yamashita and Jiang (2010)

have pointed out that the influence of an L1 has to be taken into consideration, and those collocations that are not congruent with the ELLs first language should be highlighted in the process of teaching. The proved importance of the interference of an L1 in acquiring L2 collocations suggests that "the tendency of the past few decades to downplay L1 influence and to disregard the L1 in foreign language teaching seems to be misguided" (Nesselhauf, 2003, p. 238).

One more important criterion considering the strength of associations has been pointed out (Durrant & Doherty, 2010; Durrant & Schmitt, 2009, 2010). While presenting collocations, the data of the frequencies is not enough because frequencies may be the result of coincidences and unwilling repetitions. The less frequent, yet more strongly associated word combinations have also to be considered. Therefore the parameter of mutual information (MI), proposed in 1990 by Church and Hanks, which "compares the observed number of occurrences of a word pair with its expected number of occurrences" (as cited in Durant & Doherty, 2010, p. 131) should be taken into consideration.

Besides, as Siyanova and Schmitt (2009) have suggested, native speakers have psychological intuitive feeling for the degree of frequency and cohesion of collocations in general: the native speakers congruently with the British National Corpus and with the diminishing speed perceived the high-medium-and low-frequency collocations; it was also noticeable that non-native speakers had failed to distinguish between the most-medium-and less frequent collocations. Nevertheless, though "native-speaking teachers should also be able to trust their intuitions about collocation in general" (Siyanova & Schmitt, 2009, p. 455), according to Biber and Conrad (2001), Biber, Conrad, and Cortes (2004), Biber, Conrad, and Reppen (1996), Biber et al., (1999), Biber and Reppen (2002), Conrad (2002), as well as Glisan and Drescher

(1993), textbooks and other teaching materials built on intuition, especially for intermediate and advanced levels, do not reflect the real world of language.

Approaches to teaching collocations.

The corpus-based studies have revealed the ubiquity and importance of collocations and the necessity to teach these linguistic co-occurrences. There are several approaches to teaching collocations. Thus, the deductive method is recommended to be applied under certain circumstances. According to Webb and Kagimoto (2009), a limited number of collocations (18-24 in the study) can be effectively learned deductively—through explicit exposure to collocations in context via cloze tasks and reading. The results of this study showed significant gain in both receptive and productive knowledge of collocations and understanding their meaning. Furthermore, crosslinguistic differences of the collocations of the native and target languages should be, if possible, explicated (Laufer & Waldman, 2011; Liu, 2010; Nesselhauf, 2003).

Nevertheless, the deductive method alone may not bring the best results in acquiring collocations by the ELLs. Corpus-based analyses of collocations have revealed an immense array of collocations as well as a new picture of their linguistic complexity that demands inductive teaching methods (Biber, 2009; Kennedy, 2003; Nesselhauf & Tschichold, 2002; Siyanova & Schmitt, 2008). Although the attention to most frequent collocations should be drawn explicitly to insure the degree of awareness necessary for noticing (Siyanova & Schmitt, 2008; Webb & Kagimoto, 2009), the following extensive implicit exposure to the collocations in context via corpus linguistics is essential. As Kennedy (2003), Durrant and Doher (2011) as well as Mollin (2009) have pointed out, the linguistic items found in collocations and occurring in the varieties of frequencies across particular registers cannot be combined freely, and at the same time the co-

occurrences cannot be explained grammatically because in the case of collocations the rules of co-occurrences are constrained lexically and psychologically. According to the researcher, this complexity cannot be taught explicitly, so the typical curriculum with explicit instruction is not sufficient in the contemporary, corpus-based second language learning, and a new approach in curriculum design should be considered. This novel curriculum, which "is imposed by the language itself" (Kennedy, 2003, p. 483) should include extensive repeated exposure of the SLLs to language in use selected through corpus linguistics, especially to collocations in meaningful contexts. The researcher suggests that implicit approach is crucial for establishing fluency and should dominate contemporary curricula, and that explicit instructions should only be applied to very high frequency linguistic items when teaching SLLs from lower to intermediate levels of proficiency.

The importance of this extensive repetition in learning vocabulary has also been emphasized by Folse (2004, 2011); the researcher has stated that "The single most important aspect of any vocabulary practice activity is not so much what SLLs do with the word but rather the number of times" (Folse, 2011, p. 364). This exposure, this intensive encounter, is aimed to provide the opportunity to acquire the complexity of language unconsciously, to maximize internalization, and thus to form SLLs' language in use. Collocations have to be taught by extensive repetition because they are not learned automatically (Kennedy, 2003; Nessehauf & Tschicholld, 2002; Shin & Nation, 2008). As Nessehauf and Tschichold (2002) have stated, while emphasizing the importance of collocations for effective communication, "Learners who have no implicit knowledge of multi-word units can still produce comprehensible language, but they do not achieve native-like production, thus making comprehension more difficult for their hearers" (p. 252).

Therefore, a combination of explicit and implicit methods is indispensable in teaching collocations. N. C. Ellis (2001, 2005) as cited in Durrant and Schmitt (2010) has pointed out that an explicit approach provides instantaneous understanding preparing the learners for the further implicit acquisition of collocations by input frequencies. According to N. C. Ellis (2005), after "an association is consciously made … the resultant chunk is itself subject to implicit tallying processes and so open to frequency effects" (as cited in Durrant & Schmitt, 2010, p. 166).

Revival of audiolingual method.

Finally, the revealed existence of high frequency collocations has revived certain interest in some aspects of the previously abandoned audiolingual method because collocations cannot be explained grammatically and thus have to be taught by extensive repetition (Bartsch, 2004; Biber, Conrad, & Cortes, 2004; Kennedy, 2003; Nesselhauf, 2003). The collocations are considered to be the indispensable units of discourse, and the basic way to teach these linguistic units is the systematically repeated extensive exposure to collocations in meaningful contexts of certain registers. Moreover, the most recent studies (Durrant & Schmitt, 2010) have shown that collocations are acquired more successfully after repetition in the same sentence rather than after learning them in different contexts. In addition all the researchers insist that just making language learners aware of the existence of collocations is not enough, that the most frequent collocations should be taught with the elements of rote technique. As Kennedy (2003) has framed, "It is perhaps ironical that after the 1960s, when language teachers rejected the worst excesses of audiolingualism … there was a tendency to lose sight of the continuing importance of repeated exposure … to the units of the language being learned" (p. 484). Consequently, one of the challenges in corpus-based teaching with the elements of the audiolingual method is to provide sufficient exposure of ELLs to the most frequent linguistic units as well as to less

frequent, yet strongly associated collocations to make implicit knowledge possible. Therefore, it has been recognized (Bartsch, 2004; Biber, Conrad, & Cortes, 2004; Durant & Doherty, 2010; Durant & Schmitt, 2009, 2010; Kennedy, 2003; Liu, 2010; Mollin, 2009; Nesselhauf, 2003) that further psycholinguistic studies involving cognitive analysis are necessary to increase understanding of the processes of second language acquisition by, on the one hand, acquiring implicit knowledge via extensive exposure to the most frequent collocations across registers, and on the other hand by explicitly perceiving the meaning of the most frequent collocations in the context of communicative language in use.

CHAPTER THREE: METHODOLOGY

Five Reasons for Selecting the Corpus of Contemporary American English

Because the purpose of this study is to compare the *–ing* and *–ed* participial adjectives and their collocations in different situational contexts by using corpus linguistics, the choice of a proper linguistic corpus was a matter of priority. The Corpus of Contemporary American English (COCA), created by Mark Davies at Brigham Young University (Davies, 2010, 2011), has been selected for several reasons. First, COCA is considered to be the only simultaneously large and balanced corpus of contemporary American English (it was completed in June 2012): this corpus is an electronic database of more than 450 million words of text approximately equally distributed across five sections of spoken, newspapers, magazines, fiction, and academic texts — 90-95 million words in each register (COCA, 1990-2012; Davies, 2010, 2011). Therefore, such qualities of COCA as the large word database combined with the presentation of the words across the section has been considered the optimal condition for answering the first research question regarding the most frequently used *–ing* and *–ed* participial adjectives in different situational contexts.

Second, the COCA texts represent a wide diversity of sources. Thus, in the section of spoken English there are the unscripted records from more than 150 TV and radio shows, such as *All Things Considered* (NPR), *Newshour* (PBS), *Good Morning America* (ABC), *Today Show* (NBC), *60 Minutes* (CBS), *Hannity and Colmes* (Fox), and others. In the section of newspapers, there are the texts from ten newspapers across the United States, such as *USA Today*, *New York Times*, *Atlanta Journal Constitution*, *San Francisco Chronicle*, and others. In the section of magazines, there are the texts from nearly 100 popular magazines, such as *Time*, *Men's Health*,

Good Housekeeping, *Cosmopolitan*, *Fortune*, *Christian Century*, and *Sports Illustrated*. The section of fiction represents texts of a variety of genres, such as short stories and plays from literary magazines, children's magazines, popular magazines, first chapters of first edition books from 1990 to 2012, and movie scripts. In the section of academic English, there are texts from nearly 100 peer-reviewed journals selected according to the classification system of the Library of Congress and representing such fields as philosophy, psychology, religion, world history, education, technology, and many others (COCA, 1990-2012; Davies, 2010, 2011).

Third, according to Davis (2010, 2011), the very important in second language teaching spoken section represents the actual American spoken English to the right degree. Although the creators of COCA used TV and radio programs, they worked with 95%-97% of unscripted conversations with such features of a natural discourse as false starts, interruptions, unnecessary repetitions, and so on. The disadvantage of the use of the recorded spoken English might be the people's awareness of being on the air, and thus their use of minimum profane or stigmatized words and phrases. Nevertheless, it is impossible to obtain completely authentic spoken English because even while being recorded during their conversations off the air, people still know that they are being audiotaped (Davies, 2010, 2011).

Fourth, because the subject of the current research are the *–ing*/*-ed* participial adjectives, which have the same morphologic forms with verbs (present and past participles) and nouns (gerunds), it was crucial for the research to be able to separate the *–ing*/*-ed* adjectival forms from the verbal and nounal ones. The Corpus of Contemporary American English provides the opportunity of conducting complex searches including the separation of the adjectival *–ing*/*-ed* forms from their morphologically identical verb and noun forms. The identification of the *–ing*/*-ed* participial adjectives has been accomplished by using such codes from the COCA tagset as

ing.[j] and *ed.[j*]. Although the use of computerized tagging inevitably causes some errors, according to Kennedy (2003) the errors do not substantially influence the results.

Fifth, because the second research questions of this study is examining the context-based collocations of the *–ing*/*-ed* adjectival forms that can provide insight into the use and meaning of the participial adjectives, a statistical measures showing frequencies along with the strength of associations between participial adjectives (nodes) and their collocations were the priorities in selecting a corpus linguistics. Therefore, COCA has been selected because it not only displays the lists of collocations grouped by their frequencies, but also provides the opportunity to set up such statistical measure as mutual information (MI) at a necessary ratio, and thus to view only the collocations with the probability of co-occurrence being larger than chance and thus linguistically important.

Procedures

The procedures used in this study were guided by the purpose of the study and the research questions. Thus, for answering the first research question concerning the most frequently used *–ing* and *–ed* participial adjectives in different situational contexts, two lists of the top 20 most frequently used in the neutral register the *–ing* and *–ed* participial adjectives—one list for each type of the adjectival forms—was created. To enter the proper group of words in the WORD(S) dialogue box (see Figure 1), it was necessary to separate the participial adjectives from the other *–ing*/*-ed* verb forms (e.g., gerunds, past tense verbs, present and past participles). For the specification of the *–ing*/*-ed* adjectival forms, the following syntax codes were used: for present participial adjectives—the tag *ing.[j*] (see Figure 1 as an example); for past participial adjectives—the tag *ed.[j*] (for the regular verbs derivatives), and the tags *en[j*], *n[j*], *ne[j*], *ut[j*], and *t[j*] (for the irregular verbs derivatives). Another set of codes was applied

to separate adjectives-homonyms, such as the adjective *left* relating to the side of human body from the past participial adjective *left* derived from the verb *leave*. In this case the tag left.[vvn*j*] was used.

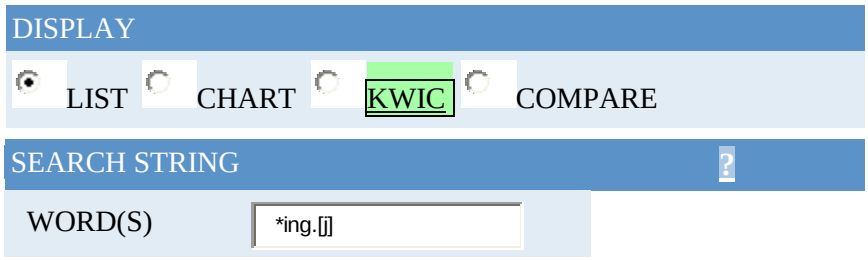

Figure 1: Application of the Tag *ing.[j] for Present Participial Adjectives, COCA (1990-2012) http://corpus.byu.edu/coca/

The second procedure was aimed to find out the most frequent present and past participial adjectives in each of five sections provided by COCA —spoken, academic, newspaper, magazine, and fiction. This procedure repeated the first one except one point: in the SECTIONS menu that displays the variety of sections, instead of IGNORE key, the keys representing the COCA sections: SPOKEN, ACADEMIC, NEWSPAPER, MAGAZINE, and FICTION were consequently chosen.

The third procedure represented the normalization of the total frequencies in the lists of participial adjectives by recounting the frequencies per 1 million words. The COCA initially displays total frequencies that are occurrences per a particular corpus linguistics: for example, for the totally it is approximately 450 million words, in spoken section—95 millions, in academic—91 millions, in magazines—95 millions, in newspapers—92 millions, and in fiction—90 million words (COCA, 1990-2012; Davies, 2010, 2011).

There are two ways to convert total frequencies into frequencies per 1 million. First way is by using the formula:

$$frequency\ per\ 1\ million = \frac{\text{total frequency} \times 1{,}000{,}000}{\text{total corpus size}}$$

The other way of conversing total frequencies into the frequencies per 1 million words of text is by using the COCA data. This method was used in all cases where the numbers from COCA were available, such as in finding out the frequencies per 1 million words for each of 20 most frequent present and past participial adjective in every section (e.g., for the participial adjective *interesting* in all five sections). To obtain the data, in the DISPLAY menu after entering the examined word with its tag in the WORD(S) dialogue box (e.g., interesting[j*]), the CHART button will be selected (the CHART button is seen in Figure 1). This will exhibit the bar numeral values of total frequencies and the frequencies per 1 million in all the COCA sections: neutral (named ALL in COCA), SPOKEN, FICTIONS, MAGAZINE, NEWSPAPER, and ACADEMIC as it is shown in Figure 2.

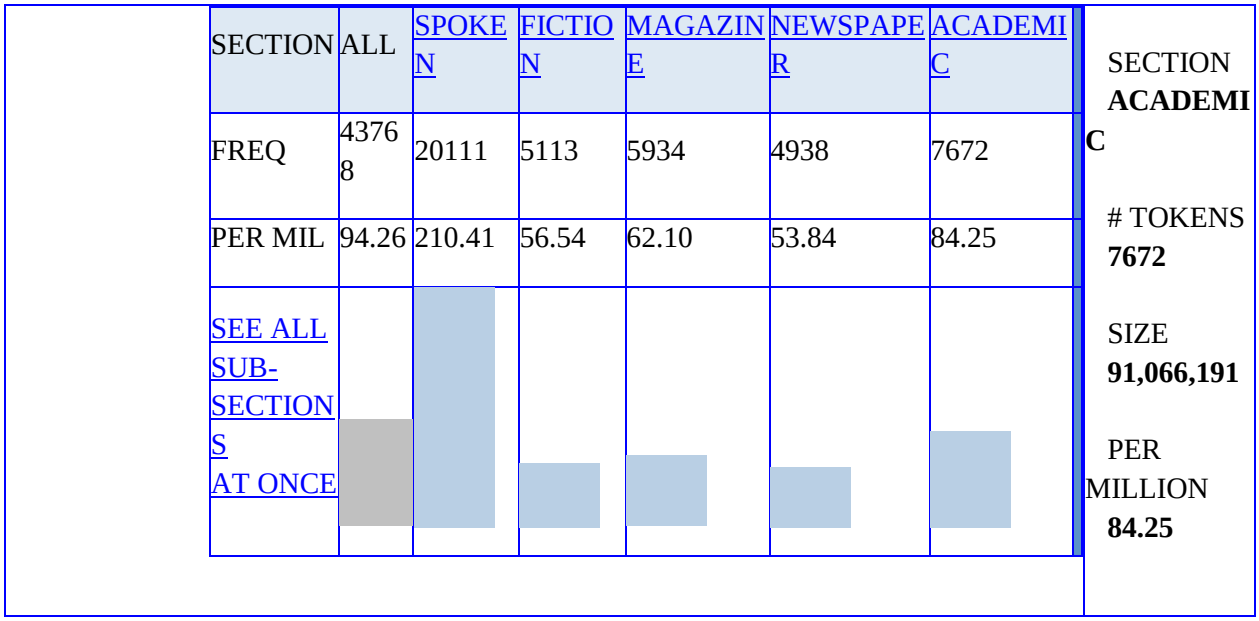

Figure 2: Example of the Chart of Frequencies for *Interesting*, COCA (1990-2012) http://corpus.byu.edu/coca/

By pointing the cursor at each section, the dialogue box on the right was activated showing the total frequency of the particular register (SECTION in COCA), the total frequency (the number of tokens #TOKENS in COCA), and frequency per million (see Figure 2).

To clarify some possible teaching implications, the fourth procedure was conducted and represented the comparative analysis of the lists of most frequent participial adjectives created in the current research with the use of the Corpus of Contemporary American English and the list of present/past participial adjectives suggested by one of the latest ESL textbook (Reppen, 2012). In the process of the comparison frequencies of each participial adjective in all 12 pairs represented in the textbook list was determined using the code adjective[j*] (e.g., amazing[j*], amazed[j*], annoying[j*], annoyed[j*], and so on). Then the *–ing* and *–ed* participial adjectives were sorted by frequencies. Lastly, the lists from the textbook were compared with the created lists of the *–ing* and *–ed* participial adjectives graphically by constructing the diagrams using Microsoft Excel 2010. The objectives of the comparative analysis were to determine whether the participial adjectives in the textbook list were in fact the most frequent in the authentic contemporary American English, whether in the textbook list the frequencies of the *–ing* adjectival forms corresponded to those of the *–ed* adjectival forms, and how many *–ing*, how many *–ed* participial adjectives were among 20 most frequent participial adjectives found in the Corpus of Contemporary American English, and to what degree the ratios of the different types of the participial adjectives (the *-ing* adjectival forms versus the *–ed* adjectival forms and the participial adjectives derived from transitive verbs versus the ones derived from transitive verbs with intransitive equivalents) from the textbook list reflected the ratios found in COCA.

The fifth procedure was determined by the second research question regarding the collocations of the participial adjectives, i.e., how the collocations reflect the specific

characteristics of the participial adjectives. The search for collocations of the 20 most frequent past and 20 most frequent present participial adjectives was conducted in the neutral register, plus the most common in ESL classroom contextual categories: academic and spoken. In COCA the categories are the sections: general, academic, and spoken. As it is shown in Figure 3, the collocations were sought in the range of 4 words before and 4 words after the node.

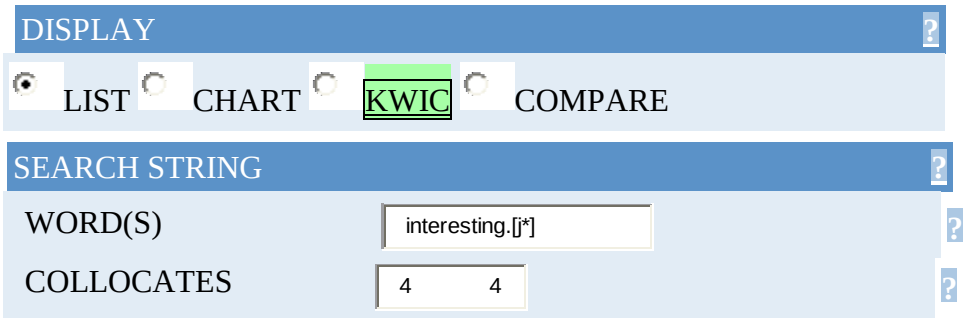

Figure 3: Application of a Certain Number of Collocates Before and After the Node, COCA, (1990-2012) http://corpus.byu.edu/coca/

The frequency-based measure of collocations is mutual information and the *t-score*. The numeral value of the minimum for mutual information (MI) was chosen to be 3 (Durant & Doherty, 2010; COCA, 1990-2012; Kennedy, 2003; Mollin, 2009), which is also default in COCA as it is seen in Figure 4.

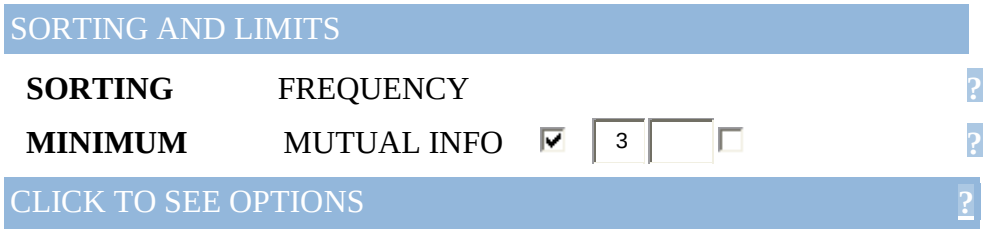

Figure 4: Application of the Value of Mutual Information (MI) , COCA, (1990-2012) http://corpus.byu.edu/coca/

This particular minimum signals that the probability of occurrence of association between two words *x* and *y* is larger than chance (Bartsch, 2004; Durant & Doherty, 2010; Kennedy, 2003). According to Stubbs (1995) and Hunston (2002), when MI ≥ 3, a collocation has the

statistical significance if the *t-score* ≥2 (as cited in Durant & Doherty, 2010, p. 142). Mutual information gives the opportunity to measure the expected co-occurrence of two words against their independent co-occurrences (Bartsch, 2004; Durant & Doherty, 2010). The selection of mutual information more than 3.0 helps to eliminate the high frequency words of non-lexical categories (function words) such as articles, conjunctions, auxiliaries, and so on.

Although the numeral value for mutual information (MI) equal 3 is the most usual value to implement in the field of applied linguistics (Durant & Doherty, 2010; COCA, 1990-2012; Kennedy, 2003; Mollin, 2009), some researchers in their latest studies (Durrant & Doherty, 2010) have argued that because "psychologically real collocations" (p.146) with the strongest psychological associations may be the subject of greater importance for the ELLs, a value of the mutual information (MI) more than 6 and the value of the *t-score* more than 7.5 may also be considered. Therefore, some of the collocations were obtained by using MI ≥ 6 to compare with the collocations when MI ≥ 3.

There are two frequency-based measures of collocations: the mutual information (MI) and the *t-score*. In the current study the *t-scores* for the collocations with MI ≥ 6 were calculated using the following formula:

$$\mathrm{t_{score}} = \frac{O - E}{\sqrt{O}}$$

where *O* is the observed frequency of occurrence of the collocation, *E* is the expected frequency of occurrence "on the null hypothesis that there is no relationship between the words" (Durrant & Doherty, 2010, p. 130),

$$E = \frac{f(\mathrm{x})}{N} \times \frac{f(\mathrm{y})}{N} \times N$$

$$P(x) = \frac{f(\mathrm{x})}{N}; \qquad P(y) = \frac{f(\mathrm{y})}{N}; \qquad P(xy) = P(x) \times P(y)$$

In the present study the *t-score* parameters were calculated only for the collocations when MI ≥ 6 and *t-score* ≥ 7.5 because when MI ≥ 3 (and *t-score* ≥ 2), the high frequencies of the node/collocation co-occurrences for the selected top 15-16 collocations and large sample sizes of COCA (450 millions of total and approximately 91-95 millions for each section) determined the very low value of probability, with the *P(xy)* being Z.0e-08 or Z.0e-09. Therefore, in such cases the *t-score* is actually equal to the square root from the observed frequency of the occurrence of the collocation ($\sqrt{O}$). For example, one of the lowest frequencies of the occurrence in this study is for the collocation *interested/primarily* in spoken register and equals 15. So, in this example the numeral values are: *O* = 15 (see Table 22, under FREQ for *primarily*); *f(primarily)* = 1,937 (see Table 22, under ALL for *primarily*); *f(interested)* = 7,717 (see Table 6, under FREQ for *interested*); *N* = 95,385,672 (see Table 5, SPOKEN section group size). To find the *t-score* we shall calculate the probabilities of occurrence of each as follows:

$$P(x) = P(interested) = \frac{f(interested)}{N} = \frac{7{,}717}{95{,}385{,}672} = 0.000081$$

$$P(y) = P(primarily) = \frac{f(primarily)}{N} = \frac{1{,}937}{95{,}385{,}672} = 0.000020$$

$$P(xy) = P(x) \times P(y) = 0.000081 \times 0.000020 = 0.00000000164\ (or\ 1.64e{-}09)$$

$$E = P(xy) \times N = 0.00000000164 \times 95{,}385{,}672 = 0.156$$

$$\mathrm{t_{score}} = \frac{O - E}{\sqrt{O}} = \frac{15 - 0.156}{\sqrt{15}} = 3.85\ (which\ is\ more\ than\ 2)$$

Finally, the qualitative analysis of the collocations was provided because collocations as lexical co-occurrences could not be analyzed by using quantitative methods alone (Bartsch, 2004; Durrant & Doherty, 2010; McCarthy & Carter, 2001; Mollin, 2009; Walker, 2011). Therefore, the qualitative analysis was provided in terms of describing the syntactic, semantic, and pragmatic relations between the collocating in the strings of a text bearing the targeted

collocations. The exposure of the strings of a text was done by clicking on each collocation from the list of 20 most frequent collocations for a particular participial adjective (e.g. for the adjective *interesting*—consequently clicking on its collocations *very*, *thing*, *question*, *note*, *particularly*, etc.).

CHAPTER FOUR: FINDINGS

This study was aimed to conduct the comparative analyses of the *–ing* and *–ed* participial adjectives and their collocations using the Corpus of Contemporary American English (COCA) and to determine the best ways of presenting these lexical items to English learners. Therefore, two research questions have been formed: the first one—concerning the most frequently used *–ed* and *–ing* participial adjectives within certain varieties of contexts, and the second one—regarding the collocations for the participial adjectives in terms of the reflection of the specific characteristics of the participial adjectives by their collocations. The findings have been organized in the tables and graphs and grouped according to these two research questions.

The Most Frequent Participial Adjectives in Neutral Register

Research question 1 asks about the most frequently used present and past participial adjectives in different situational contexts. Therefore, the top 20 most frequent present and past participial adjectives have been searched in each of the 6 sections of COCA and presented as the findings across the six sections, or registers. The term 'register,' as it has been mentioned, means a situational context and has become a jargon term among the researchers of linguistic corpora (Biber, 2012; Biber & Conrad, 2001; Biber, Conrad, & Cortes, 2004; Biber, Conrad, & Reppen, 1996, 1999; Biber & Reppen, 2002; Conrad, 2000, 2002). Therefore, in the current work the following registers have been considered: the neutral register (which is labeled "all sections" in COCA), academic register (academic section in COCA), spoken register (spoken section in COCA), newspapers register (newspapers section in COCA), magazine register (magazine section in COCA) and fiction register (fiction section in COCA).

The neutral register is the first one to consider the top 20 most frequent *–ing* and 20 most frequent *–ed* participial adjectives. The results are presented in Table 1 and Table 2. Consequently, Table 1 compares the frequencies (total frequencies as well as normalized frequencies—words per 1 million) of the whole amount of the *-ing* participial adjectives with the frequencies of the whole amount of the *–ed* participial adjectives in the COCA of 450 million words which we has called neutral register. Thus, Table 1 shows that in the neutral register the *–ed* participial adjectives with their total frequency of 1,030,000 tokens and normalized frequency of 2,300 tokens per 1 million, predominate over the *–ing* participial adjectives of 740,000 total frequency and 1,600 tokens per 1 million.

Table 2 shows the 20 most frequent *–ing* and the 20 most frequent *–ed* participial adjectives in the neutral register while presenting their total and normalized frequencies in a diminishing order. It is noticeable that single *–ing* or *–ed* participial adjectives derived from transitive verbs with intransitive equivalents predominate over the *–ing*/*–ed* pairs of the participial adjectives derived from transitive verbs of psychological state (underlined). As it can be seen, among the 20 *–ing* participial adjectives only 4 are derived from transitive verbs of psychological state: *interesting, amazing, surprising, exciting* and among *–ed* participial adjectives—only 3: *concerned, interested* and *surprised*.

Table 1
Frequencies of Participial Adjectives in Neutral Register ('All Sections' in COCA)

NEUTRAL Register Corpus Size ≈ 450,000,000 words of text	
-ing adjectives Tokens (or total frequency) ≈ 740,000 Frequencies per 1 Million ≈ 1,600	*-ed* adjectives Tokens (or total frequency) ≈ 1,030,000 Frequencies per 1 Million ≈ 2,300

Table 2
The Top Twenty Most Frequent Participial Adjectives in Neutral Register

THE TOP 20 MOST FREQUENT ***-ING*** PARTICIPIAL ADJECTIVES	FREQ	FREQ per 1 mill	THE TOP 20 MOST FREQUENT ***–ED*** AND **IRREGULAR** PARTICIPIAL ADJECTIVES	FREQ	FREQ per 1 mill
INTERESTING	43,798 ®	94.34	1. UNIDENTIFIED	46,063	99.20
WILLING	33,905	73.03	2. CONCERNED	38,428	82.78
GROWING	30,641	66.00	3. INVOLVED	37,596	81.01
FOLLOWING	30,144	64.96	4. SUPPOSED	35,630	76.75
LIVING	19,228	41.42	5. INTERESTED	32866®	70.80
EXISTING	19,076	41.08	6. UNITED	29,096	62.68
REMAINING	18,790	40.47	7. MARRIED	25,459	54.87
AMAZING	18,757 ®	40.40	8. USED	22,081	47.59
LEADING	17,894	38.54	9. INCREASED	21,836	47.05
INCREASING	16,884	36.37	10. SURPRISED	21,554 ®	46.45
DEVELOPING	15,360	33.09	11. LIMITED	21,246	45.76
SURPRISING	13,045 ®	28.10	12. TIRED	21,088	45.43
WORKING	12,786	27.54	13. SO-CALLED	15,729	33.88
ONGOING	12,389	26.69	14. ARMED	14,474	31.19
EXCITING	12,129 ®	26.13	15. BROKEN	13,996	30.14
RUNNING	10,674	22.99	16. LOST	13,778	29.68
CHANGING	10,264	22.10	17. ADVANCED	13,520	29.13
MISSING	10,160	21.88	18. COMPLICATED	13,135	28.31
OVERWHELMING	8,925	19.23	19. UNKNOWN	12,961	27.92
CONTINUING	8,750	18.84	20. SCARED	12,295	26.50

Notes:

1. the underlined items represent *–ing* and *–ed* participial adjectives derived from transitive verbs of state
2. the highlighted items are presented in all five lists (the academic, spoken, newspapers, magazines, and fiction registers in Tables 4, 6, 8, 10, 12) of the top 20 most frequent participial adjectives
3. ® participial adjectives used in the textbook list (Reppen, 2012, p. 158).

The Most Frequent Participial Adjectives across Registers

Research question 1 considers the most frequently used *–ing* and *–ed* participial adjectives within certain varieties of contexts, that is across the registers (academic, spoken, newspapers, magazines, and fiction registers which are 'sections' in COCA). The results are presented in Tables 3-12. All Tables with uneven numbers (Tables 3, 5, 7, 9, 11) compare the total and normalized (words per 1 million) frequencies of the total amount of the *-ing* participial adjectives in every particular register with the frequencies of the total amount of the *–ed* participial adjectives in the same register. All five registers (academic, spoken, newspapers, magazines, and fiction) have been considered. We can see that the *–ed* participial adjectives predominate over the *–ing* participial adjectives in each of these five registers.

All five tables with even numbers (Tables 4, 6, 8, 10, 12) show the 20 most frequent *–ing* and the 20 most frequent *–ed* participial adjectives in the named five registers while presenting the total and normalized frequencies of the participial adjectives in a diminishing order. As it is seen in Table 4 representing the academic register, the top 20 most frequent participial adjectives in the neutral register (see Table 2) do not absolutely coincide with the top 20 most frequent participial adjectives in the academic register (see Table 4). Thus, among the top 20 *–ing* participial adjectives of the academic register, only 15 are found in the neutral register, and in the academic register 5 new items have emerged: the adjectives *underlying, emerging, nursing, resulting, and corresponding.* Even fewer similar items—only 9—are found in both neutral and academic registers of the top 20 most frequent *–ed* participial adjectives, while 11 new words of high frequency (95.99 - 43.77 per 1 million)—*gifted, related, given, perceived, detailed, written, shared, proposed, sacred, continued, selected*—have been found.

Table 3
Frequencies of Participial Adjectives in Academic Register ('Section' in COCA)

ACADEMIC Section Corpus Size ≈ 91,044,778 words of text	
-ing adjectives Tokens ≈ 210,000 Frequencies per 1 Million ≈ 2,307	*-ed* adjectives Tokens ≈ 270,000 Frequencies per 1 Million ≈ 2,966

Table 4
The Top Twenty Most Frequent Participial Adjectives in Academic Register

THE TOP 20 MOST FREQUENT ***-ING*** PARTICIPIAL ADJECTIVES	FREQ	FREQ per 1 mill		THE TOP 20 MOST FREQUENT ***–ED*** AND **IRREGULAR** PARTICIPIAL ADJECTIVES	FREQ	FREQ per 1 mill
FOLLOWING	16,349	179.54	1.	INCREASED	12,580	138.16
EXISTING	9,754	107.12	2.	INVOLVED	11,339	124.55
INCREASING	8,875	97.46	3.	LIMITED	9,835	108.00
GROWING	8,821	96.86	4.	GIFTED	8,740	95.99
DEVELOPING	8,532	93.69	5.	CONCERNED	8,561	94.02
INTERESTING	7,660®	84.11	6.	INTERESTED	6,935®	76.15
WILLING	6,049	66.42	7.	RELATED	6,702	73.61
ONGOING	5,499	60.38	8.	GIVEN	6,271	68.86
LIVING	4,486	49.26	9.	PERCEIVED	6,158	67.68
REMAINING	4,446	48.82	10.	UNITED	5,753	63.21
CHANGING	4,402	48.34	11.	ADVANCED	5,572	61.19
LEADING	4,176	45.86	12.	DETAILED	5,110	56.13
WORKING	4,165	45.74	13.	USED	4,967	54.59
UNDERLYING	3,874	42.54	14.	WRITTEN	4,887	53.66
SURPRISING	3,837®	42.13	15.	ARMED	4,864	53.43
EMERGING	3,679	40.40	16.	SHARED	4,485	49.28
CONTINUING	3,410	37.45	17.	PROPOSED	4,411	48.46
NURSING	2,784	30.58	18.	CONTINUED	4,035	44.32
RESULTING	2,642	29.01	19.	SELECTED	3,984	43.37
CORRESPONDING	2,464	27.06	20.	SO-CALLED	3,949	43.36

Notes:

1. The underlined items represent *–ing* and *–ed* participial adjectives derived from transitive verbs of state
2. The highlighted items are also presented in the list the top 20 most frequent *–ing* and *–ed* participial adjectives in the neutral register (Table 2).
3. ® participial adjectives used in the textbook list (Reppen, 2012, p. 158).

The following tables (Tables 4, 6, 8, 10, 12) represent the lists of the top 20 most frequent *–ing* and *–ed* participial adjectives in the spoken, newspapers, magazines, and fiction registers and show the picture comparable with the described academic register where not all participial adjectives from the neutral register are found in the specified registers, and new items emerge in each of the specified registers. Thus, in the spoken register (Table 6) there are 5 new *–ing* adjectives: *fascinating, devastating, shocking, disturbing, coming*, and 6 *new –ed* adjectives: *worried, excited, alleged, convinced, pleased, hidden*; in the newspapers register (Table 8)—5 new –ing adjectives: *winning, managing, outstanding, passing, driving*, and 4 new *–ed* adjectives: *associated, proposed, retired, estimated*; in the magazine register (Table 10)—3 new *–ing* adjectives: *rolling, promising, driving*, and 4 new *–ed* adjectives—*chopped, dried, frozen, sophisticated*; in the fiction register (Table 12)—10 new *–ing* adjectives: *fucking, burning, dying, smiling, sleeping, charming, flying, passing, boring, gleaning*, and 9 new *–ed* participial adjectives: *pleased, left, worried, excited, embarrassed, frozen, closed, frightened*.

To sum up the issue of frequencies, it is worth to point out that among the 20 most frequent *–ing/-ed* adjectives only 8 forms are found in all six registers: *interesting* (freq. 43,798), *interested* (freq. 32,866), *willing* (freq.33,905), *growing* (freq. 30,641), *living* (freq. 19,228), *remaining* (freq. 18,790), *concerned* (freq. 38,428), *used* (freq. 22,081), and the only pair of the participial adjectives—*interesting/interested*—is found in all six registers (see Table 2, the highlighted items).

In addition, in all five registers (see Tables 4, 6, 8, 10, 12) there is the same predominance that we have seen in the neutral register (see Table 2)—the predominance of the participial adjectives derived from transitive verbs with intransitive equivalents (not underlined) over the participial adjectives derived from transitive verbs of psychological state (underlined).

Table 5
Frequencies of Participial Adjectives in Spoken Register

SPOKEN Section Corpus Size ≈ 95,385,672 words of text	
-ing adjectives Tokens ≈ 130,000 Frequencies per 1 Million ≈ 1,363	*-ed* adjectives Tokens ≈ 220,000 Frequencies per 1 Million ≈ 2,306

Table 6
The Top Twenty Most Frequent Participial Adjectives in Spoken Register

THE TOP 20 MOST FREQUENT ***-ING*** PARTICIPIAL ADJECTIVES	FREQ	FREQ per 1 mill	THE TOP 20 MOST FREQUENT ***–ED*** AND **IRREGULAR** PARTICIPIAL ADJECTIVES	FREQ	FREQ per 1 mill
INTERESTING	19,983®	209.08	1. UNIDENTIFIED	44,784	468.56
WILLING	9,709	101.58	2. CONCERNED	12,702	132.90
AMAZING	8,010®	83.81	3. INVOLVED	11,144	116.60
GROWING	3,829	40.06	4. SUPPOSED	10,260	107.35
EXCITING	3,164®	33.10	5. UNITED	8,381	87.69
MISSING	2,837	29.68	6. INTERESTED	7,717®	80.74
LEADING	2,759	28.87	7. MARRIED	5,834	61.04
FASCINATING	2,697	28.22	8. SURPRISED	5,212®	54.53
SURPRISING	2,403®	25.14	9. SO-CALLED	4,427	46.32
WORKING	2,350	24.59	10. SCARED	3,864	40.43
LIVING	2,307	24.14	11. TIRED	3,618	37.85
OVERWHELMING	2,221	19.23	12. USED	3,451	36.11
ONGOING	1,979	20.71	13. ARMED	3,389	35.46
DEVASTATING	1,848	19.34	14. WORRIED	3,136®	32.81
SHOCKING	1,778	18.60	15. COMPLICATED	3,115	32.59
CONTINUING	1,751	18.32	16. EXCITED	2,875®	30.08
RUNNING	1,719	17.99	17. ALLEGED	2,693	28.18
DISTURBING	1,664	17.41	18. CONVINCED	2,261	23.66
COMING	1,657	17.34	19. PLEASED	2,184	22.85
REMAINING	1,453	15.20	20. HIDDEN	2,176	22.77

Notes:

1. The underlined items represent *–ing* and *–ed* participial adjectives derived from transitive verbs of state
2. The highlighted items are also presented in the list the top 20 most frequent *–ing* and *–ed* participial adjectives in the neutral register (Table 2).
3. ® participial adjectives used in the textbook list (Reppen, 2012, p. 158).

Table 7
Frequencies of Newspapers Register

NEWSPAPERS Section Corpus Size ≈ 91,680,966 words of text	
-ing adjectives Tokens ≈ 160,000 Frequencies per 1 Million ≈ 1,745	*-ed* adjectives Tokens ≈ 210,000 Frequencies per 1 Million ≈ 2,291

Table 8
The Top Twenty Most Frequent Participial Adjectives in Newspapers Register

THE TOP 20 MOST FREQUENT *-ING* PARTICIPIAL ADJECTIVES	FREQ	FREQ per 1 mill		THE TOP 20 MOST FREQUENT *–ED* AND IRREGULAR PARTICIPIAL ADJECTIVES	FREQ	FREQ per 1 mill
GROWING	7,949	86.67	1.	UNITED	10,140	110.57
WILLING	7,338	80.01	2.	INVOLVED	7,333	79.98
LEADING	5,587	60.92	3.	CONCERNED	7,226	78.81
INTERESTING	4,956®	54.04	4.	INTERESTED	6,420®	70.01
REMAINING	4,482	48.87	5.	SUPPOSED	5,805	63.32
EXISTING	3,763	41.03	6.	MARRIED	4,663	50.88
RUNNING	3,612	39.38	7.	ASSOCIATED	4,303	46.93
LIVING	3,472	37.86	8.	PROPOSED	4,254	46.41
FOLLOWING	3,419	37.30	9.	RETIRED	4,223	46.05
AMAZING	3,106®	33.88	10.	LIMITED	4,212	45.94
INCREASING	2,773	30.24	11.	USED	4,137	45.12
WINNING	2,561	27.92	12.	SURPRISED	3,528®	38.48
MANAGING	2,532	27.61	13.	ESTIMATED	3,404	37.13
EXCITING	2,476®	27.00	14.	INCREASED	3,278	35.74
OUTSTANDING	2,453	26.75	15.	TIRED	3,243	35.37
WORKING	2,437	26.57	16.	ARMED	3,130	34.14
PASSING	2,403	26.20	17.	SO-CALLED	3,124	34.06
DRIVING	2,378	25.93	18.	LOST	3,014	32.86
SURPRISING	2,128®	23.20	19.	BROKEN	2,738	29.85
ONGOING	2,085	22.73	20.	COMPLICATED	2,575	28.09

Notes:

1. The underlined items represent *–ing* and *–ed* participial adjectives derived from transitive verbs of state
2. The highlighted items are also presented in the list the top 20 most frequent *–ing* and *–ed* participial adjectives in the neutral register (Table 2).
3. ® participial adjectives used in the textbook list (Reppen, 2012, p. 158).

Table 9
Frequencies of Magazines Register

MAGAZINES Section, Corpus Size ≈ 95,564,706 words of text	
-ing adjectives Tokens ≈ 170,000 Frequencies per 1 Million ≈ 1,779	*-ed* adjectives Tokens ≈ 220,000 Frequencies per 1 Million ≈ 2,302

Table 10
The Top Twenty Most Frequent Participial Adjectives in Magazines Register

THE TOP 20 MOST FREQUENT ***-ING*** PARTICIPIAL ADJECTIVES	FREQ	FREQ per 1 mill	THE TOP 20 MOST FREQUENT ***–ED*** AND IRREGULAR PARTICIPIAL ADJECTIVES	FREQ	FREQ per 1 mill
GROWING	7,996	83.70	1. INTERESTED	6,174®	64.62
WILLING	6,661	69.74	2. CONCERNED	5,676	59.43
FOLLOWING	6,449	67.59	3. INVOLVED	5,574	58.40
REMAINING	6,351	66.47	4. MARRIED	5,551	58.15
INTERESTING	5,991®	62.73	5. SUPPOSED	5,467	57.23
LIVING	5,415	56.68	6. USED	5,017	52.53
LEADING	4,702	49.21	7. CHOPPED	4,848	50.76
AMAZING	4,094®	42.84	8. LIMITED	4,210	44.12
EXISTING	3,984	41.70	9. INCREASED	4,180	43.80
INCREASING	3,378	35.36	10. UNITED	4,132	43.25
SURPRISING	3,348®	35.06	11. TIRED	3,919	41.03
DEVELOPING	3,344	34.99	12. ADVANCED	3,858	40.38
EXCITING	3,188®	33.39	13. DRIED	3,616	37.89
RUNNING	2,757	28.86	14. FROZEN	3,513	36.76
WORKING	2,756	28.88	15. SOPHISTICATED	3,377	35.36
ROLLING	2,615	27.39	16. SURPRISED	3,337®	34.94
ONGOING	2,362	24.74	17. SO-CALLED	3,302	34.57
PROMISING	2,284	23.92	18. LOST	3,199	32.86
CHANGING	2,237	23.42	19. COMPLICATED	3,001	31.44
DRIVING	2,222	23.28	20. UNKNOWN	2,871	30.04

Notes:

1. The underlined items represent *–ing* and *–ed* participial adjectives derived from transitive verbs of state
2. The highlighted items are also presented in the list the top 20 most frequent *–ing* and *–ed* participial adjectives in the neutral register (Table 2).
3. ® participial adjectives used in the textbook list (Reppen, 2012, p. 158).

Table 11
Frequencies of Fiction Register

FICTION Section Corpus Size ≈ 90,344,134 words of text	
-ing adjectives Tokens ≈ 120,000 Frequencies per 1 Million ≈ 1,328	*-ed* adjectives Tokens ≈ 210,000 Frequencies per 1 Million ≈ 2,324

Table 12
The Top Twenty the Most Frequent Participial Adjectives in Fiction Register

THE TOP 20 MOST FREQUENT ***-ING*** PARTICIPIAL ADJECTIVES	FREQ	FREQ per 1 mill		THE TOP 20 MOST FREQUENT ***–ED*** AND IRREGULAR PARTICIPIAL ADJECTIVES	FREQ	FREQ per 1 mill
INTERESTING	5,212®	57.64	1.	SUPPOSED	11,255	124.47
FUCKING	4,499	49.75	2.	TIRED	9,526	105.35
WILLING	4,150	45.89	3.	SURPRISED	8,323®	92.05
LIVING	3,550	39.26	4.	MARRIED	6,526	72.19
AMAZING	2,751®	30.42	5.	BROKEN	5,668	62.68
BURNING	2,680	29.64	6.	INTERESTED	5,626®	62.25
FOLLOWING	2,578	28.51	7.	SCARED	4,959	54.85
DYING	2,281	25.22	8.	USED	4,517	49.97
MISSING	2,208	24.42	9.	CONCERNED	4,263	47.16
SMILING	2,196	24.28	10.	PLEASED	3,745	41.45
SLEEPING	2,097	23.19	11.	LOST	3,715	41.08
REMAINING	2,057	22.75	12.	LEFT	3,680	40.69
GROWING	2,047	22.64	13.	WORRIED	3,612®	39.96
CHARMING	1,979	21.88	14.	EXCITED	3,111®	34.45
FLYING	1,795	19.85	15.	EMBARRASSED	2,979®	32.94
RUNNING	1,792	19.82	16.	FROZEN	2,606	28.82
PASSING	1,749	19.34	17.	CLOSED	2,530	27.99
BORING	1,727®	19.10	18.	FRIGHTENED	2,474	27.38
EXCITING	1,572®	17.38	19.	UNKNOWN	2,375	26.26
GLEAMING	1,553	17.17	20.	CONTINUED	2,363	26.16

Notes:

1. The underlined items represent *–ing* and *–ed* participial adjectives derived from transitive verbs of state
2. The highlighted items are also presented in the list the top 20 most frequent *–ing* and *–ed* participial adjectives in the neutral register (Table 2).
3. ® participial adjectives used in the textbook list (Reppen, 2012, p. 158).

Counterparts of Participial Adjectives

Because research question 1 considers the frequencies of present and past participial adjectives, the issue of whether all *–ing* participial adjectives have their *–ed* counterparts with comparable frequencies and vice versa—whether all *–ed* participial adjectives have their *–ing* counterparts is worth to be explored. The results represented in Table 13 show that among the top 20 most frequent *–ing* participial adjectives in neutral register only 11 have their *–ed* counterparts (highlighted), such as: *interesting-interested, amazing-amazed, increasing-increased, developing-developed, surprising-surprised, exciting-excited, continuing-continued.*

Table 13
The Top Twenty Most Frequent *–ing* Participial Adjectives with their *–ed* Counterparts in Neutral register

THE TOP 20 MOST FREQUENT *ING* PARTICIPIAL ADJECTIVES IN NEUTRAL REGISTER	FREQ	FREQ per 1 mill	THEIR *–ED* COUNTERPARTS	FREQ	FREQ per 1 mill
1. INTERESTING	43,798 ®	94.34	INTERESTED	32,866 ®	70.80
2. WILLING	33,905	73.03	WILLED	296	0.66
3. GROWING	30,641	66.00	GROWN	743	1.65
4. FOLLOWING	30,144	64.96	FOLLOWED	5	0.01
5. LIVING	19,228	41.42	LIVED	3	0.00
6. EXISTING	19,076	41.08	EXISTED	0	0.00
7. REMAINING	18,790	40.47	REMAINED	3	0.00
8. AMAZING	18,757 ®	40.40	AMAZED	3,926 ®	8.46
9. LEADING	17,894	38.54	LED	11	0.02
10. INCREASING	16,884	36.37	INCREASED	21,836	47.05
11. DEVELOPING	15,360	33.09	DEVELOPED	6.003	13.33
12. SURPRISING	13,045 ®	28.10	SURPRISED	21,554 ®	46.45
13. WORKING	12,786	27.54	WORKED	161	0.36
14. ONGOING	12,389	26.69	ONGONE	0	0.00
15. EXCITING	12,129 ®	26.13	EXCITED	10,084 ®	21.72
16. RUNNING	10,674	22.99	RUN	6	0.01
17. CHANGING	10,264	22.10	CHANGED	1,374	3.05
18. MISSING	10,160	21.88	MISSED	1,267	2.82
19. OVERWHELMING	8,925	19.23	OVERWHELMED	909	2.02
20. CONTINUING	8,750	18.84	CONTINUED	10,366	22.32

Notes:
1. The underlined items represent –ing and –ed participial adjectives derived from transitive verbs of state
2. The highlighted items have their counterparts comparable by frequencies (at least more than 1 per 1 mill)
3. ® participial adjectives used in the textbook list (Reppen, 2012, p. 158).

Even fewer *–ing/-ed* participial adjective pairs are seen in the list of the top 20 most frequent *–ed* participial adjectives with their *–ing* counterparts, as is represented in Table 14. Here only 8 *–ed* participial adjectives have their comparable (at least more than 1 per 1 million) by frequencies *–ing* counterparts: *interested-interesting, increased-increasing,* and *surprised-surprising*. Moreover, some counterparts have not been found in COCA database at all, such as the *–ing* forms of the 4 top most frequent *–ed* participial adjectives *unidentified, concerned, involved,* and *supposed* (see Table 14).

Table 14
The Top Twenty Most Frequent *–ed* and Irregular Participial Adjectives with their *–ing* Counterparts in Neutral Register

THE TOP 20 MOST FREQUENT *-ED* AND IRREGULAR PAST PARTICIPIAL ADJECTIVES	FREQ	FREQ per 1 mill	THEIR *-ING* COUNTERPARTS	FREQ	FREQ per 1 mill
1. UNIDENTIFIED	46,063	99.20	UNIDENTIFYING	0	0.00
2. CONCERNED	38,428	82.78	CONCERNING	0	0.00
3. INVOLVED	37,596	81.01	INVOLVING	0	0.00
4. SUPPOSED	35,630	76.75	SUPPOSING	0	0.00
5. INTERESTED	32,866®	70.80	INTERESTING ®	43,798	94.34
6. UNITED	29,096	62.68	UNITING	181	0.40
7. MARRIED	25,459	54.87	MARRYING	56	0.12
8. USED	22,081	47.59	USING	5	0.01
9. INCREASED	21,836	47.05	INCREASING	16,884	36.37
10. SURPRISED	21 554®	46.45	SURPRISING®	13,045	28.10
11. LIMITED	21,246	45.76	LIMITING	1,902	4.23
12. TIRED	21,088	45.43	TIRING	646	1.46
13. SO-CALLED	15,729	33.88	SO-CALLING	0	0.00
14. ARMED	14,474	31.19	ARMING	20	0.04
15. BROKEN	13,996	30.14	BREAKING	2,009	4.46
16. LOST	13,778	29.68	LOSING	1,931	4.29
17. ADVANCED	13,520	29.13	ADVANCING	1,955	4.34
18. COMPLICATED	13,135	28.31	COMPLICATING	403	0.90
19. UNKNOWN	12,961	27.92	UNKNOWING	231	0.51
20. SCARED	12,295	26.50	SCARING	14	0.03

Notes:
1. The underlined items represent –ing and –ed participial adjectives derived from transitive verbs
2. The highlighted items have their counterparts comparable by frequencies (at least more than 1 per 1 mill)
3. ® participial adjectives used in the textbook list (Reppen, 2012, p. 158).

Comparison of the Findings with the Textbook List

To clarify some possible teaching implications, the issue of to what extent the most frequently used *–ing* and *–ed* participial adjectives found in COCA are reflected in one of the latest ESL textbook (Reppen, 2012) has been considered. In the textbook this list is described as "…some of the most common pairs of adjectives ending in *–ing* and *–ed*" (Reppen, 2012, p. 158). To perform the evaluation, the list of recommended for teaching participial adjectives from the textbook, Table 15, has been compared with the lists of the 20 top participial adjectives across all six registers available in COCA: neutral (see Table 2), academic (see Table 4), spoken (see Table 6), newspapers (see Table 8), magazines (see Table 10), and fiction (see Table 12).

Table 15
Frequencies of the Participial Adjectives Presented in the Textbook (Reppen, 2012, p. 158)

-ING PARTICIPIAL ADJECTIVES	FREQ	FREQ per 1 mill	***–ED*** PARTICIPIAL ADJECTIVES	FREQ	FREQ per 1 mill
AMAZING	18,757	40.40	1. AMAZED	3,926	8.46
ANNOYING	2,532	5.45	2. ANNOYED	2,324	5.00
BORING	5,642	12.15	3. BORED	4,327	9.32
CONFUSING	3,745	8.07	4. CONFUSED	4,577	9.86
DEPRESSING	1,954	4.21	5. DEPRESSED	6,145	13.23
EMBARRASSING	4,529	9.75	6. EMBARRASSED	6,325	13.62
EXCITING	12,129	26.13	7. EXCITED	10,084	21.72
FRUSTRATING	3,944	8.49	8. FRUSTRATED	3,253	7.01
INTERESTING	43,798	94.34	9. INTERESTED	32,866	70.80
RELAXING	1,245	2.68	10. RELAXED	3,932	8.47
SURPRISING	13,045	28.10	11. SURPRISED	21,554	46.45
WORRYING	2,890	6.22	12. WORRIED	10,607	22.84
TOTAL	**114,210**	**≈246.00**	**TOTAL**	**109,920**	**≈236.00**

Notes:
1. The underlined items represent *–ing* and *–ed* participial adjectives derived from transitive verbs of state
2. The highlighted items are found among the top 20 most frequent participial adjectives in any of the six registers (neutral, newspapers, magazines, fiction, academic, and spoken English).

Comparison across COCA registers

The results of the evaluation have shown the following. First, the comparison of the textbook list (see Table 15) with the list of the top 20 most frequent *–ing* and the 20 most frequent *–ed* participial adjectives in the neutral register (see Table 2) has revealed that only 4 –

ing participial adjectives from the textbook (*interesting, amazing, surprising,* and *exciting*) and only 2 *–ed* participial adjectives (*interested* and *surprised*) are in the list obtained from COCA (see Table 2). The other 34 most frequent *–ing* and *–ed* participial adjectives in the list acquired from COCA are not mentioned in the textbook.

Second, the comparison of the top 20 most frequent participial adjectives in the specified registers: academic (see Table 4), spoken (see Table 6), newspapers (see Table 8), magazines (see Table 10), and fiction (see Table 12) with the participial adjectives from the list in the textbook (see Table 15), has shown that more than a half of the participial adjectives from the textbook list are not found among the most frequent adjectives in any of COCA registers. Thus, only 5 *–ing* participial adjectives among 12 presented in the textbook list are found across COCA registers: *amazing* (found in the neutral, spoken, newspapers, magazines, and fiction registers), *boring* (found in the fiction register), *exciting* (neutral, spoken, newspapers, magazines), *interesting* (found in all six registers), and *surprising* (academic, spoken, newspapers, magazines). The same number— 5—of the *–ed* participial adjectives from the textbook list have been found among the most frequent *–ed* participial adjectives across registers in COCA: *embarrassed* (found in the fiction register), *excited* (spoken, fiction), *interested* (found in all six registers), *surprised* (neutral, spoken, newspapers, magazines, fiction), and *worried* (fiction) (see Tables 4, 6, 8, 10, 12). The rest of the participial adjectives from the textbook list have not been found among the top 20 most frequent participial adjectives in any of the six COCA registers (see Tables 4, 6, 8, 10, 12). These participial adjectives presented only in the textbook list are: 7 *–ing* participial adjectives: *annoying, confusing, depressing, embarrassing, frustrating, relaxing, worrying*, and 7 *–ed* participial adjectives: *amazed, annoyed, bored, confused, depressed, frustrated, relaxed*.

Comparison of the participial adjectives in relation to their counterparts.

All participial adjectives in the textbook list are presented in the pairs of the *-ing/ed* counterparts (see Table 15), and being considered as pairs, these participial adjectives do represent the most common pairs of the participial adjectives. The problem with the presentation of the participial adjectives exclusively in pairs lies in the fact that this is the only presentation of the *–ing/-ed* adjectival forms without any further explanations at more advanced levels regarding the prevailing 'single' participial adjectives in the authentic language. As it has been mentioned, according to COCA data, not all participial adjectives have their counterparts. Thus, among the top 20 most frequent participial adjectives, as it has been shown in the example of their occurrences in neutral register (see Table 13 and Table 14), half of them do not have their corresponding counterparts with comparable frequencies.

Comparison of the ratios of frequencies of the *–ing* versus *–ed* participial adjectives.

The ratio of the frequencies of the *–ing* versus the frequencies of the *–ed* participial adjectives in the ESL textbook list (see Table 15) differs from the ratio of the frequencies of the *–ing* versus *–ed* participial adjectives in the lists of the top 20 most frequent participial adjectives across all registers obtained from COCA (see Tables 2, 4, 6, 8, 10, 12). Thus, Figure 5 shows that in the textbook list the ratio is close to 1:1 with slight predominance of the *–ing* participial adjectives.

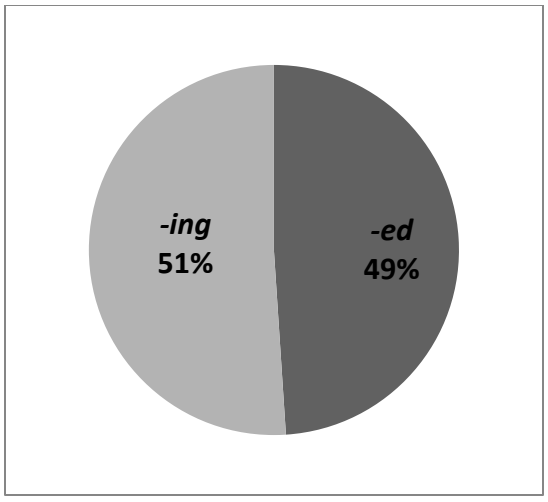

Figure 5: Ratio (≈1:1) of the Frequencies of the *–ing* versus *–ed* Participial Adjectives in the Textbook List

In contrast, the ratio of the total frequencies of the *–ing* versus the total frequencies of the *–ed* participial adjectives from COCA shows the steady predominance of the *–ed* participial adjectives over the *–ing* participial adjectives across all registers. Thus, Figure 6 shows that in neutral register the ratio of the *–ing*/*-ed* participial adjectives is 41% to 59%, ≈0.69. It is also quite noticeable that the ratio of the *–ing*/*-ed* participial adjectives varies across registers: Figure 7 shows that in the academic register the difference between the frequencies of the *–ing* and *–ed* participial adjectives is minimal (44% to 56%, ≈0.78); while the maximal differences are in the spoken (37% to 63% , Figure 8) and fiction (36% to 64%, Figure 9) registers with almost equal ratios ≈0.58 (spoken register, Figure 8) and 0.56 (fiction register, Figure 9).

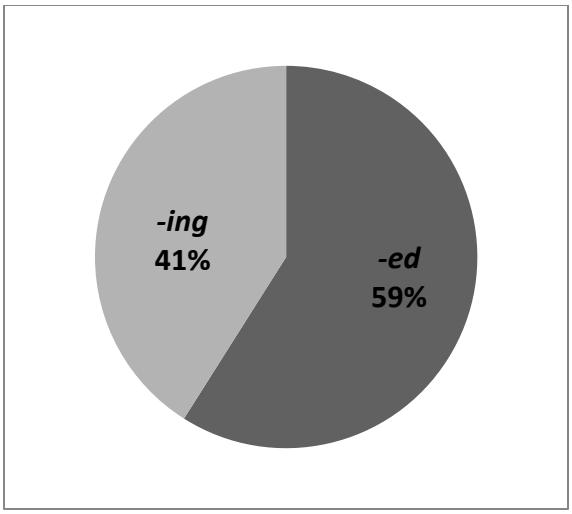

Figure 6: Ratio (≈0.69) of the Total Frequencies of the *–ing* versus *–ed* Participial Adjectives in Neutral register of COCA

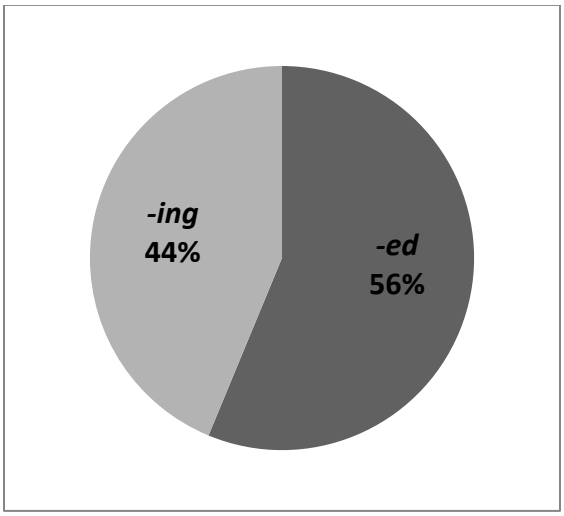

Figure 7: Ratio (≈0.78) of the Total Frequencies of the *–ing* versus *–ed* Participial Adjectives in Academic register of COCA

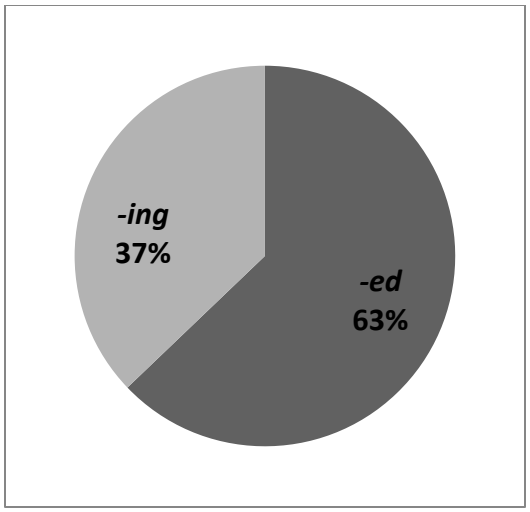

Figure 8: Ratio (≈0.58) of the Total Frequencies of the *–ing* versus *–ed* Participial Adjectives in Spoken register of COCA

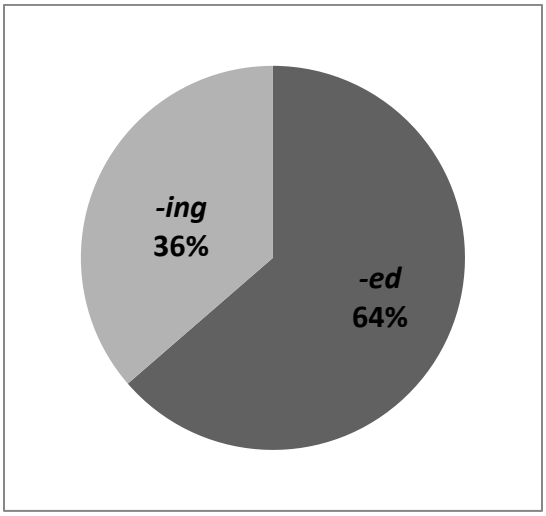

Figure 9: Ratio (≈0.56) of the Total Frequencies of the *–ing* versus *–ed* Participial Adjectives in Fiction register of COCA

Comparison of the ratios of the participial adjectives derived from different types of verbs.

In the textbook list of the *–ing/-ed* participial adjectives the ratio of the adjectives derived from transitive verbs (see Table 15, underlined items) versus the participial adjectives

derived from transitive verbs with intransitive equivalents (see Table 15, not underlined items) considerably differs from the ratio in the lists of the top 20 most frequent *–ing* and *–ed* participial adjectives in all six registers of COCA: neutral (see Table 2), academic (see Table 4), spoken (see Table 6), newspapers (see Table 8), magazines (see Table 10), and fiction (see Table 12). Thus, Figure 10 shows that in the textbook list the participial adjectives derived from transitive verbs are three times more predominant than the participial adjectives derived from transitive verbs with their intransitive equivalents; the ratio is 75% to 25%, and is equal to 3.

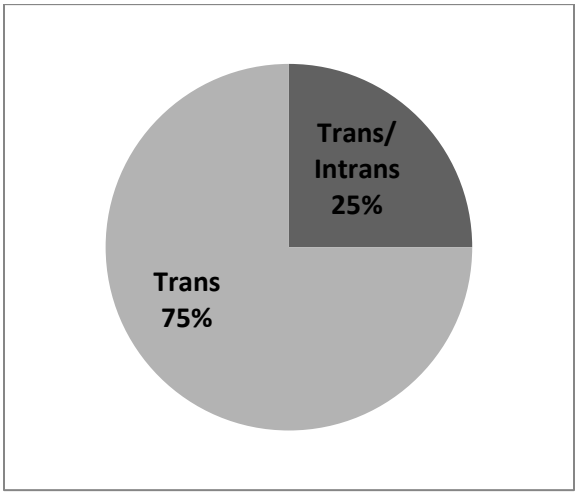

Figure 10: Ratio (=3) of the total frequency of the *–ing* and *–ed* Participial Adjectives Derived from Transitive Verbs of State Versus the *–ing* and *–ed* Participial Adjectives Derived from Transitive Verbs with their Intransitive Equivalents in the Textbook List

On the other hand, in the lists of the top 20 most frequent participial adjectives from COCA, the participial adjectives derived from the transitive verbs is in significant minority. This fact is illustrated on the example of the neutral register. Figure 11 shows that the ratio of the *–ing* adjectival forms derived from transitive verbs of psychological state to the *–ing* adjectival forms derived from transitive verbs with intransitive equivalents in the neutral register is 20% to 80%, and is equal to 0.25. Figure 12 shows that in the same neutral register the ratio of the *–ed* adjectival forms derived from transitive verbs of psychological state to the *–ed* adjectival forms

derived from transitive verbs with intransitive equivalents is 15% to 85%, and is equal to 0.18. As can be seen in Figures 8, 9, and 10, the ratio representing participial adjectives derived from transitive verbs versus participial adjectives derived from transitive verbs with intransitive equivalents represented in the textbook list (Figure 10) exceeds the ratio in authentic language (Figures 11 and 12) more than 10 times—compare 3 with 0.25 and 0.18).

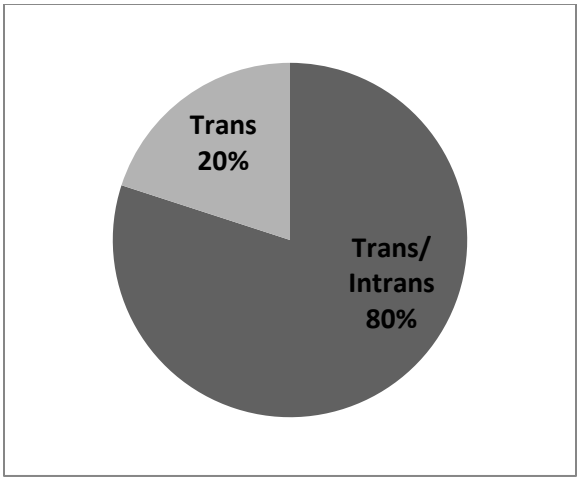

Figure 11: Ratio (≈0.25) of the *–ing* Participial Adjectives Derived from Transitive Verbs Versus the *-ing* Participial Adjectives Derived from Transitive Verbs with their Intransitive Equivalents in the list of 20 Most Frequent Participial Adjectives from COCA in Neutral Register

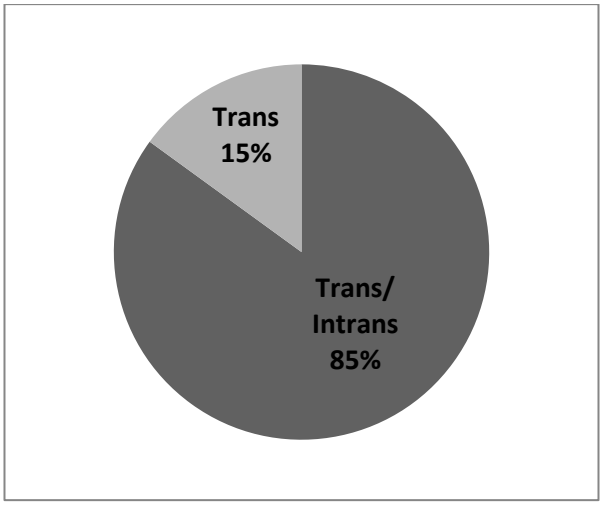

Figure 12: Ratio (≈0.18) of the *–ed* Participial Adjectives Derived from Transitive Verbs Versus the *-ed* Participial Adjectives Derived from Transitive Verbs with their Intransitive Equivalents in the list of 20 Most Frequent Participial Adjectives from COCA in Neutral Register

Participial adjectives with prefixes.

In the lists of the top 20 most frequent participial adjectives from COCA there is one type of participial adjectives that was not mentioned in the textbook as well as in any of the studies concerning participial adjectives the author of the current research has encountered. This is the subcategory of the participial adjectives with prefixes (*ongoing, unidentified, so-called, unknown,* and *outstanding*) that are derived from intransitive verbs with their transitive equivalents (*go, stand*) and transitive verbs with their intransitive equivalents (*identify, call, know*) by adding the prefixes *on-, un-, so-,* and *out-*. What is noteworthy, is the fact that the verbs with these prefixes, such as **ongo*, **unidentify*, **so-call*, **unknow*, and **outstand* do not exist. Also, these participial adjectives can be of both—either *-ing* or *-ed* forms, yet they do not form *–ing/-ed* pairs. Table 16 shows that these participial adjectives are found in all COCA registers, and are often characterized by high frequencies.

Table 16
Participial Adjectives with Prefixes across COCA Registers

REGISTER	***-ING* PARTICIPIAL ADJECTIVES**	**# AMONG 20 MOST FREQUENT**	**FREQUECY PER 1 MILL**	***-ED* PARTICIPIAL ADJECTIVES**	**# AMONG 20 MOST FREQUENT**	**FREQUECY PER 1 MILL**
NEUTRAL BASED ON TABLE 2	ONGOING	# 14	26.69	UNIDENTIFIED SO-CALLED UNKNOWN	# 1 # 13 # 19	99.20 33.88 27.92
ACADEMIC BASED ON TABLE 4	ONGOING	# 8	60.38	SO-CALLED	# 20	43.36
SPOKEN BASED ON TABLE 6	ONGOING	# 13	20.71	UNIDENTIFIED SO-CALLED	# 1 # 9	468.56 46.32
NEWSPAPERS BASED ON TABLE 8	OUTSTANDING ONGOING	#15 # 20	26.75 22.73	SO-CALLED	#17	34.06
MAGAZINES BASED ON TABLE 10	ONGOING	# 17	24.74	SO-CALLED UNKNOWN	# 17 # 20	34.57 30.04
FICTION BASED ON TABLE 12				UNKNOWN	# 19	26.26

Characteristics of the Collocations for Past and Present Participial Adjectives

Research question 2 asks how the collocations for the *–ing* and *–ed* participial adjectives reflect their specific characteristics. To answer the question, the following results have been obtained. First, the collocations for the *–ing* and *–ed* participial adjectives have been explored when the value of mutual information is more or equal 3 (MI ≥ 3) in three most common TESOL registers: neutral, academic, and spoken. The establishing the value of MI ≥ 3 has provided the opportunity to reveal the collocations with high frequencies and strong associations. Second, the collocations for the same participial adjectives have been explored, but with the different value of mutual information—when MI ≥ 6. The specifying MI ≥ 6 has allowed exposing the collocations with the strongest associations despite their possible low frequencies. Because of the lower frequencies of the collocations of MI ≥ 6 type, these collocations have been considered only in one register—neutral, and their distribution across the register has been studied in the COCA situational contexts directly, by reading the lines of concordance (see Appendixes I-L).

For exploring the differences between the collocations for *–ing* and *–ed* participial adjectives, the collocations for only two pairs of participial adjectives have been considered: *interesting/interested* and *increasing/increased*. The following section explains the reasons for choosing these particular participial adjectives.

Reasons for choosing the particular participial adjectives (*interesting/interested* and *increasing/increased*) for the analysis of their collocations.

These participial adjectives have been chosen for two reasons: first, because these two pairs of participial adjectives represent the derivatives from two different types of verbs. The participial adjectives *interesting* and *interested* are derived from a transitive verb of state, or emotion (*interest*); therefore, the *–ing* participial adjectives in comparison with the *–ed*

participial adjectives of the same type imply entirely different meaning (Brekke, 1988; Borer, 1990; Folse, 2012; Gao, 1997; Scovel, 1974). Thus, in the case of using the *–ing* form *interesting* (e.g. *It's just not something that has been interesting to me at all*) the subject (*it*) creates, by being *interesting*, a state for the object (*me*); on the other hand, while using the *–ed* form *interested* (e.g. *They are interested in controversies*) COCA (1990-2012), the subject (*they*) becomes a recipient of the state of being *interested* incited by the object (*controversies*).

The other pair of the participial adjectives, which is *increasing* and *increased*, represents the participial adjectives derived from a transitive verb of action (*increase*) with intransitive equivalents; therefore, the *–ing* participial adjectives imply meaning close to the meaning of the *–ed* participial adjectives: the *–ing* form means an on-going activity of still *increasing* (Brekke, 1988; Borer, 1990; Folse, 2012; Gao, 1997; Scovel, 1974) (e.g. *Bank of America has been under increasing pressure from investors*), while the *–ed* form means the resultant activity of have already been *increased* (e.g. *We will feel increased global pressure to prevent the spread of disease*) (COCA, 1990-2012).

Second, these two pairs of participial adjectives have been chosen because of their high frequencies and their ubiquity across the registers. Thus, the pair *interesting/interested* is the only one that is found of all six COCA registers (see Tables 2, 4, 6, 8, 10, 12); moreover, the participial adjective *interesting* is # 1 in three registers: the neutral register with its frequency per 1 million equal 94.34 (see Table 2), the spoken, and fiction registers (see Tables 6, 12). The word *interested* is also found in all COCA registers and is # 1 in the magazines register with frequency per 1 million equal 64.62. (see Table 10).

The pair *increasing/increased* is the most frequent among the participial adjectives derived from transitive verbs with intransitive equivalents. It is found almost in all COCA

registers: in neutral, academic, newspapers, and magazines (see Tables 2, 4, 8, 10) with conspicuously high frequency in the academic register where the participial adjective *increased* is # 1 with frequency per 1 million equal 138.16, and the participial adjective *increasing* is # 3 with frequency per 1 million equal 97.46 (see Table 4).

Collocations for the adjectives *interesting* and *interested* when MI ≥ 3.

In the current study the first comparative analysis of the collocations for the pair *interesting/interested* has been conducted for the collocations of the highest frequencies when MI ≥ 3. As it has been pointed out, mutual information (MI) measures the expected co-occurrence of two words against their independent co-occurrences, and if the established value of MI ≥ 3, it discards the high frequency words such as articles, conjunctions, auxiliaries, and some prepositions (Bartsch, 2004; COCA, 1990-2012; Davies, 2011; Kennedy, 2003). The number of collocations to observe has been selected for the reason of a sharp decline in frequency, percentage or mutual information (MI) after a certain number; thus, for the collocations for *interesting* and *interested*, as it is seen in Table 17 and Table 18, the number of collocations is 15.

Table 17 and Table 18 show that the collocations for the participial adjective *interesting* are noticeably different from the collocations for the participial adjective *interested*. This difference reflects the intrinsic different meaning of the *–ing* participial adjective *interesting* in comparison with the *–ed* participial adjective *interested*: the *–ing* participial adjective creates a state for an object, while the *–ed* participial adjective indicates that the subject is a recipient of the state stimulated by the object.

Table 17
Collocations for *Interesting*, Neutral Register, when MI ≥ 3

#	COLLOCATION	FREQ	ALL	%	MI
1	VERY	4484	481403	0.93	3.63
2	THING	1475	212182	0.70	3.20
3	QUESTION	880	145099	0.61	3.01
4	NOTE	804	44664	1.80	4.58
5	PARTICULARLY	372	57100	0.65	3.11
6	INTERESTING	284	43984	0.65	3.10
7	RAISES	160	10989	1.46	4.27
8	ASPECT	121	13684	0.88	3.55
9	EXCITING	116	12214	0.95	3.65
10	PHENOMENON	102	11276	0.90	3.58
11	TWIST	82	6921	1.18	3.97
12	CHALLENGING	74	10774	0.69	3.19
13	DYNAMIC	68	9760	0.70	3.21
14	WHATS	66	3701	1.78	4.56
15	INFORMATIVE	63	1576	4.00	5.73

Notes:
1. For collocations, according to COCA (2009-2012) the percentage (%) is used instead of frequencies per 1 million
2. Because after the number 15 (the highlighted items) there is usually a noticeable drop in the values of frequency, percentage, and mutual information (MI), only the top 15 most frequent collocations will be shown and considered in all following analyses.
3. The highlighted item is also found among the collocations for the *–ed* form *interested*
4. The underlined collocations are those with strongest associations, with MI close to 6

Table 18
Collocations for *Interested*, Neutral Register, when MI ≥ 3

#	COLLOCATIONS	FREQ	ALL	%	MI
1	'M	2094	428957	0.49	3.11
2	AM	591	119780	0.49	3.12
3	BECAME	580	90167	0.64	3.51
4	PARTICULARLY	510	57100	0.89	3.98
5	PARTIES	430	30540	1.41	4.64

#	COLLOCATIONS	FREQ	ALL	%	MI
6	ANYONE	398	67652	0.59	3.38
7	SEEING	220	44457	0.49	3.13
8	FINDING	197	35877	0.55	3.28
9	HEARING	186	34927	0.53	3.23
10	READERS	179	20322	0.88	3.96
11	BUYING	159	20957	0.76	3.74
12	PRIMARILY	152	18901	0.80	3.83
13	BECOMING	141	29097	0.48	3.10
14	KNOWING	136	27440	0.50	3.13
15	GENUINELY	114	3559	3.20	5.82

Note:
1. The highlighted item is also found among the collocations for the *–ed* form *interested*
2. The underlined collocations are those with strongest associations, with MI close to 6

Consequently, Tables 17 and 18 demonstrate the following differences between the collocations for *interesting* versus the collocations for *interested*. First, among the top 15 most frequent collocations for *interesting* and 15 most frequent collocations for *interested* only one collocation—the adverb *particularly* is the same. The fact that the collocations for *interesting* differ from the collocations for *interested* reflects the dissimilarity in meaning between these two participial adjectives.

Second, as it has been mentioned, the *–ing* participial adjectives derived from verbs of state or emotion typically describe inanimate nouns while the *–ed* participial adjectives derived from verbs of state or emotion—animated nouns (Emonds, 1991; Folse, 2012). The collocations for *interesting* versus collocations for *interested* reflect this feature of the participial adjectives: for the *–ing* participial adjective *interesting* the collocations represent inanimate nouns: *thing, question, note, aspect, phenomenon, twist, insights, dynamics, contrast, combinations, notion, concept* (see Table 17), while the collocations for the *–ed* participial adjective *interested* describe animate nouns: *parties* (meaning *people*), *anyone, readers, scholars, researchers, persons* (see

Table 18). Also, the diversity of the nouns among the collocations for both *–ing* and *–ed* participial adjectives is conspicuous.

Third, for the participial adjective *interesting* all adjectives are 'true' adjectives (the ones with which we can use adverbial modifiers of degree such as *very*); the adjectival collocations are: *exciting, dynamic, challenging* (see Table 17) (e.g. *It's just an extraordinarily interesting and exciting story*) (COCA, 1990-2012). On the other hand, among the collocations for the participial adjective *interested* there are no 'true' adjectives; moreover, there are no adjectives of any kind; instead, the *–ing* verbal forms that collocate with *interested*, such as *seeing, finding, hearing, buying, becoming, knowing* are gerunds (see Table 18) in the varieties of syntactic structures (e.g. *I was interested in seeing what was going on…* or *…it was a bit like writing about Henry V and then becoming interested in Laurence Olivier's movie*) (COCA, 1990-2012). Also, the high level of occurrences of gerunds among the collocations for the participial adjective *interested* is noticeable: there are 6 gerunds among 15 collocations (see Table 18).

Fourth, as it has been mentioned, the *–ing* adjective pattern is not normally used with the first person; in contrast, the *–ed* participial adjective pattern is frequently used with the first person (Folse, 2012; Scovel, 1974). The results show that the collocations for *interesting* and *interested* reflect this characteristic. Thus, with the *–ing* participial adjective *interesting* the impersonal *whats* (*…whats* [*what is*] *interesting…*) is found among its collocations (see Table 17). On the other hand, for the *–ed* participial adjective *interested* the collocations *'m* and *am*, bound to the first person structure *I am*, are the top 2 most frequent collocations (see Table 18).

To compare the collocations for the participial adjectives *interesting* and *interested* across registers, two commonly used in ESL classrooms registers have been considered: the academic and spoken registers represented in Table 19, Table 20, Table 21, and Table 22.

Table 19
Collocations for *Interesting*, Academic Register, when MI ≥ 3

#	COLLOCATIONS	FREQ	ALL	%	MI
1	NOTE	534	16090	3.32	5.60
2	PARTICULARLY	186	20850	0.89	3.71
3	FINDING	136	10702	1.27	4.22
4	ASPECT	60	6283	0.95	3.81
5	THING	54	9536	0.57	3.05
6	RAISES	49	2352	2.08	4.93
7	OFFERS	49	7670	0.64	3.23
8	FUN	39	2502	1.56	4.51
9	INSIGHTS	39	3133	1.24	4.19
10	COMPARE	37	4484	0.83	3.60
11	PRESENTS	34	5309	0.64	3.23
12	FEATURE	34	5488	0.62	3.18
13	EXCITING	33	1740	1.90	4.80
14	CHALLENGING	31	3856	0.80	3.56
15	PHENOMENON	29	5155	0.56	3.04

Notes:
1. The highlighted collocations are new for the academic register in comparison with neutral
2. The underlined collocations are those with strongest associations, with MI close to 6

Table 19 shows that in the academic register for the participial adjective *interesting* seven new collocations have been found in comparison with the neutral register. The collocations are: *finding, offers, fun, insights, compare, presents, feature*. The unusually looking in the academic register collocation *fun* is widely used in pedagogical articles in such word combinations as *interesting fun activity* (see Appendix A: Collocation *Interesting/Fun* in Academic Context).

Table 20
Collocations for *Interesting*, Spoken Register, when MI ≥ 3

#	COLLOCATION	FREQ	ALL	%	MI
1	VERY	3216	237246	1.36	3.02
2	THING	1190	86642	1.37	3.04
3	NOTE	143	5841	2.45	3.87

#	COLLOCATION	FREQ	ALL	%	MI
4	RAISES	65	1884	3.45	4.36
5	WHATS	65	3498	1.86	3.47
6	ARTICLE	46	3394	1.36	3.02
7	DYNAMIC	41	1065	3.85	4.52
8	PHENOMENON	40	1393	2.87	4.10
9	CONCEPT	37	2355	1.57	3.23
10	ASPECT	31	2247	1.38	3.04
11	TWIST	25	1097	2.28	3.77
12	ASPECTS	23	1609	1.43	3.09
13	COMPARISON	20	1154	1.73	3.37
14	OBSERVATION	18	674	2.67	3.99
15	STATISTIC	17	446	3.81	4.51

Note:

1. The highlighted collocations are new for the spoken register in comparison with neutral

Table 20 shows that in the spoken register for the participial adjective *interesting* there are six new collocations in comparison with the neutral register: *article, concept, aspects, comparison, observation,* and *statistic*.

Table 21
Collocations for *Interested*, Academic Register, when MI ≥ 3

#	COLLOCATIONS	FREQ	ALL	%	MI
1	PARTIES	206	10966	1.88	4.80
2	AM	192	13017	1.47	4.45
3	PARTICULARLY	173	20850	0.83	3.62
4	BECAME	156	20776	0.75	3.48
5	RESEARCHERS	114	14992	0.76	3.49
6	READERS	88	7891	1.12	4.05
7	PRIMARILY	78	10205	0.76	3.50
8	SCHOLARS	69	8721	0.79	3.55
9	ANYONE	65	5107	1.27	4.24
10	PARTICIPATING	62	4611	1.34	4.32
11	'RE	60	9081	0.66	3.29
12	'M	59	5644	1.05	3.95

#	COLLOCATION	FREQ	ALL	%	MI
13	PURSUING	49	1897	2.58	5.26
14	BECOMING	44	7253	0.61	3.17
15	EXPLORING	42	2465	1.70	4.66

Notes:
1. The highlighted collocations are new for the academic register in comparison with neutral
2. The underlined collocations are those with strongest associations, with MI close to 6.

Table 21 shows that in the academic register for the participial adjective *interested* five new collocations have been found in comparison with the neutral register. The collocations are: *researchers, scholars, participating, pursuing, exploring*. The noteworthy feature of the collocations for *interested* in the academic register is the presence of new gerunds *participating, pursuing, exploring* in such word combinations as *interested in pursuing*, *interested in exploring* (see Appendix B: Collocation *Interested/Pursuing* in Academic Context).

Table 22
Collocations for *Interested*, Spoken Register, when MI ≥ 3

#	COLLOCATION	FREQ	ALL	%	MI
1	PARTICULARLY	108	11150	0.97	3.89
2	HEARING	81	11540	0.70	3.42
3	INTERESTED	61	7898	0.77	3.56
4	KNOWING	55	5023	1.09	4.07
5	FINDING	44	5764	0.76	3.55
6	PARTIES	41	6567	0.62	3.26
7	BUYING	35	4464	0.78	3.58
8	LEARNING	30	4241	0.71	3.44
9	BECOMING	26	4463	0.58	3.16
10	PROTECTING	23	2237	1.03	3.97
11	PURSUING	22	1086	2.03	4.95
12	GENUINELY	20	580	3.45	5.72
13	TERRIBLY	17	1999	0.85	3.70
14	TOPIC	16	2340	0.68	3.39
15	PRIMARILY	15	1937	0.77	3.57

Notes:
1. The highlighted collocations are new for the spoken register in comparison with neutral

2. The underlined collocations are those with strongest associations, with MI close to 6

Table 22 shows that in the spoken register for the participial adjective *interested* there are four new collocations in comparison with the neutral register: *interested, learning, pursuing, terribly, topic*. The noticeable feature is the replication of the adjective *interested* as its collocation. (see Appendix C: Collocation *Interested/Interested* in Spoken Context). One more collocation is quite noticeable in the spoken register: it is the colloquial adverb of degree *terribly* which is uncommon in other registers.

Collocations for the adjectives *increasing* and *increased* when MI ≥ 3.

The participial adjectives *increasing* and *increased* are the ones derived from a transitive verb of action with its intransitive equivalents. The *–ing* and *–ed* participial adjectives of this category suggest quite similar meaning of whether or not the event was completed (Brekke, 1988; Borer, 1990; Gao, 1997; Scovel, 1974). Table 23 and Table 24 show that the collocations for *increasing* (Table 23) and *increased* (Table 24) reflect the closely related meanings of the participial adjectives *increasing* and *increased*.

Table 23
Collocations for *Increasing*, Neutral Register, when MI ≥ 3

#	COLLOCATIONS	FREQ	ALL	%	MI
1	NUMBER	1377	166125	0.83	4.83
2	NUMBERS	745	48876	1.52	5.71
3	PRESSURE	364	50329	0.72	4.64
4	DEMAND	243	28429	0.85	4.88
5	LEVELS	228	53309	0.43	3.88
6	FREQUENCY	209	10457	2.00	6.10
7	POPULATION	206	60071	0.34	3.56
8	INTEREST	188	76223	0.25	3.08
9	COSTS	185	50964	0.36	3.64

#	COLLOCATION	FREQ	ALL	%	MI
10	AWARENESS	182	14193	1.28	5.46
11	RATES	180	43560	0.41	3.83
12	TAXES	176	30729	0.57	4.30
13	COMPETITION	160	30025	0.53	4.20
14	TREND	157	15266	1.03	5.14
15	IMPORTANCE	155	28467	0.54	4.23

Notes:

1. The highlighted collocations are also found among the collocations for *increas**ed***
2. The underlined collocations are those with strongest associations, with MI close to 6

Table 24
Collocations for *Increased*, Neutral Register, when MI ≥ 3

#	COLLOCATIONS	FREQ	ALL	%	MI
1	RISK	1525	64449	2.37	5.97
2	ASSOCIATED	544	39792	1.37	5.18
3	DEMAND	376	28429	1.32	5.13
4	RESULT	348	68865	0.51	3.75
5	COSTS	347	50964	0.68	4.18
6	PRESSURE	341	50329	0.68	4.17
7	LEVELS	338	53309	0.63	4.07
8	COMPETITION	332	30025	1.11	4.88
9	LEAD	303	65448	0.46	3.62
10	SPENDING	297	39599	0.75	4.32
11	PRODUCTION	297	44788	0.66	4.14
12	INCREASED	284	43209	0.66	4.13
13	AWARENESS	281	14193	1.98	5.72
14	ACTIVITY	281	41020	0.69	4.19
15	ATTENTION	280	74124	0.38	3.33

Notes:

3. The highlighted collocations are also found among the collocations for *increas**ing***
4. The underlined collocations are those with strongest associations, with MI close to 6

As it can be seen in Table 23 and Table 24, among 15 most frequent collocations for *increasing* and 15 most frequent collocations for *increased*, there are 6 similar collocations:

demand, costs, pressure, levels, competition, awareness. Also, the tables show that both participial adjectives—*increasing* and *increased*—describe inanimate nouns such as *number, numbers, pressure, demand, levels, frequency, populations, interest, activity, attention*. It is also noticeable that most of the collocations are nouns: for *increasing* all collocations are nouns: for *increased*—13 of 15 collocations are nouns. Plus, among the collocations for *increased*, the verb *associate* of high frequency has been found.

To compare the collocations for the pair *increasing/increased* across registers, the two most commonly presented in classroom registers—academic and spoken—have been chosen. Tables 25, 26, 27, and 28 show the following results.

Table 25
Collocations for *Increasing*, Academic Register, when MI ≥ 3

#	COLLOCATION	FREQ	ALL	%	MI
1	NUMBER	571	52359	1.09	3.80
2	NUMBERS	365	10795	3.38	5.44
3	PRESSURE	149	13222	1.13	3.85
4	DEMAND	126	9562	1.32	4.08
5	TREND	123	5317	2.31	4.89
6	AWARENESS	117	7865	1.49	4.25
7	IMPORTANCE	117	18194	0.64	3.04
8	RATES	106	16182	0.66	3.07
9	FREQUENCY	105	7677	1.37	4.13
10	DECREASING	94	1378	6.82	6.45
11	COMPLEXITY	94	4288	2.19	4.81
12	EVER	89	11799	0.75	3.27
13	DEMANDS	88	8205	1.07	3.78
14	EMPHASIS	85	9909	0.86	3.46
15	DIVERSITY	80	9149	0.87	3.48
16	RAPIDLY	76	4724	1.61	4.36

Notes:
1. The highlighted collocations are new for the academic register in comparison with neutral

2. The underlined collocations are those with strongest associations, with MI close to 6

Table 25 demonstrates several noticeable features of the distribution of the collocations for the *increasing* across the neutral and academic registers. First, the top 4 collocations in the neutral and academic registers are the same: *number, numbers, pressure,* and *demand*. Moreover, the collocation *numbers* in both registers are characterized by high frequencies along with particularly strong associations (MI being close to 6, such as 5.71 and 5.44). Second, in the academic register for the participial adjective *increasing*, 8 new collocations have been found in comparison with the neutral register. The collocations are: *trend, decreasing, complexity, ever, demands, emphasis, diversity* and *rapidly*; among them the collocation *decreasing* of high frequency and strong association is noticeable (see Appendix D: Collocation *Increasing/Decreasing* in Academic Context).

The following Table 26 allows the comparison of the collocations for the participial adjective *increasing* across the neutral and spoken registers.

Table 26
Collocations for *Increasing*, Spoken Register, when MI ≥ 3

#	COLLOCATION	FREQ	ALL	%	MI
1	NUMBER	110	38957	0.28	4.67
2	TAXES	70	11450	0.61	5.78
3	PRESSURE	64	9633	0.66	5.90
4	NUMBERS	49	11404	0.43	5.27
5	UNDER	46	34788	0.13	3.57
6	INCREASING	28	2373	1.18	6.73
7	SPENDING	28	13124	0.21	4.26
8	VIOLENCE	25	11693	0.21	4.27
9	AMOUNT	23	9938	0.23	4.38
10	AMONG	17	15251	0.11	3.33
11	COMPETITION	15	3695	0.41	5.19

#	COLLOCATION	FREQ	ALL	%	MI
12	RATES	14	5689	0.25	4.47
13	COSTS	14	6231	0.22	4.34
14	DEMAND	13	3605	0.36	5.02
15	CRITICISM	13	3645	0.36	5.00

Notes:

1. The highlighted collocations are new for the spoken register in comparison with neutral
2. The underlined collocations are those with strongest associations, with MI close to 6

Table 26 shows that in the spoken register among the collocations for *increasing* there are the same 4 collocations similar to the collocations in the neutral and academic registers: *number, pressure, numbers,* and *demand*. There are also 7 new collocations in the spoken register in comparison with neutral: *under, increasing, spending, violence, amount, among,* and *criticism*; among these collocations the use of the preposition *under* can be the subject of special attention in terms of ESL teaching (see Appendix E: Collocation *Increasing/Under* in Spoken Context when MI ≥ 3).

Also, in the spoken register 6 new collocations of high frequencies with strong associations (with MI close to 6) have been found: *taxes, pressure, numbers, increasing, competition,* and *demand*. Here we can see that the collocation *increasing* as a repetition of the node *increasing* has a particularly strong association (MI = 6.73). (see Appendix F: Collocation *Increasing/Increasing* in Spoken Context when MI ≥ 3).

The following Table 27 shows the specific collocations for the participial adjective *increased* in the academic register. Here 7 new collocations in comparison with the neutral register are seen: *rates, opportunities, emphasis, productivity, resulted,* and *decreased*. (see Appendix G: Collocation *Increased/Due* in Academic Context).

Table 27
Collocations for *Increased*, Academic Register, when MI ≥ 3

#	COLLOCATION	FREQ	ALL	%	MI
1	RISK	759	24100	3.15	4.83
2	ASSOCIATED	432	24871	1.74	3.97
3	LEAD	217	16711	1.30	3.55
4	ATTENTION	204	20625	0.99	3.16
5	AWARENESS	193	7865	2.45	4.47
6	PRESSURE	190	13222	1.44	3.70
7	DEMAND	173	9562	1.81	4.03
8	DUE	172	17342	0.99	3.16
9	RATES	144	16182	0.89	3.00
10	COMPETITION	140	9981	1.40	3.66
11	OPPORTUNITIES	125	13292	0.94	3.08
12	EMPHASIS	124	9909	1.25	3.50
13	PRODUCTIVITY	108	3639	2.97	4.74
14	RESULTED	105	6697	1.57	3.82
15	DECREASED	103	3648	2.82	4.67

Note:
1. The highlighted collocations are new for the academic register in comparison with neutral

The following Table 28 presents the collocations for the participial adjective *increased* in the spoken register. In comparison with the neutral register, 7 new collocations have been found: *security*, *taxes*, *increased*, *cancer*, *funding*, *violence*, and *heart*. There are also a significant amount of collocations with strong associations (with MI close to 6); moreover, 4 of them have MI > 6: *risk*, *increased*, *competition*, and *funding*. (see Appendix H: Collocation *Increased/Risk* in Academic Context).

Table 28
Collocations for *Increased*, Spoken Register, when MI ≥ 3

#	COLLOCATION	FREQ	ALL	%	MI
1	RISK	167	10234	1.63	6.98
2	SPENDING	85	13124	0.65	5.65
3	SECURITY	73	30195	0.24	4.23
4	TAXES	59	11450	0.52	5.32
5	INCREASED	51	3304	1.54	6.90
6	CANCER	49	10147	0.48	5.23
7	COSTS	40	6231	0.64	5.64
8	COMPETITION	32	3695	0.87	6.07
9	FUNDING	30	3528	0.85	6.04
10	PRESSURE	29	9633	0.30	4.55
11	VIOLENCE	29	11693	0.25	4.27
12	HEART	27	15687	0.17	3.74
13	DEMAND	26	3605	0.72	5.81
14	PRODUCTION	23	3702	0.62	5.59
15	ASSOCIATED	22	2739	0.80	5.96

Notes:
1. The highlighted collocations are new for the spoken register in comparison with neutral
2. The underlined collocations are those with strongest associations, with MI close to 6

Collocations for the participial adjectives when MI ≥ 6.

In the previous section, the top most frequent collocations for the participial adjectives *interesting/interested* and *increasing/increased* when MI ≥ 3 have been considered because this value (MI ≥ 3) is normally applied in the field of Linguistics (COCA, 1990-2012; Kennedy, 2003; Mollin, 2009). As it has been pointed out, among the top most frequent collocations when MI ≥ 3, only few high frequency collocations with MI ≥ 6 have been found. To present the assortment of the collocations more systematically, the collocations of lower frequencies, yet with the stronger associations when MI ≥ 6 have also been examined. In addition, the other

measure based on frequency, the *t-score*, has been introduced because when MI ≥ 6 and the *t-score* ≥ 7.5, the collocations are considered to be psychologically real (Durrant & Doherty, 2010).

In the Table 29, the colocations for the participial adjective *interesting* when MI ≥ 6 are presented. Only 2 tokens in this table have been selected for the reason of a sharp decrease in frequency of the collocations after number 2. The search was done only for the neutral register, because it is easy to track the changes across registers directly in the COCA contexts for only two collocations (see Appendix I).

Table 29
Collocations for *Interesting*, Neutral Register, when MI ≥ 6

#	COLLOCATION	t_{score}	FREQ	ALL	%	MI
1	TIDBITS	5	25	483	5.18	6.10
2	SIDELIGHT	3.6	13	54	24.07	8.32

Table 29 shows that both top collocations are nouns. The application of MI ≥ 6 gives the opportunity to reveal rare word combinations with strong associations. The collocation *tidbits* is used with the participial adjective *interesting* in all COCA registers including academic and spoken. In the academic register the word combination is used in such phrases as …*these sites often offer interesting tidbits of collection data and background information*…; in the spoken register—such as … *have been trying to work up some pretty interesting little tidbits here* (see Appendix I: Collocation *Interesting/Tidbits* in Academic and Spoken Contexts when MI ≥ 6).

The collocation *sidelight* is used in all COCA registers as well, including the academic register: *One interesting sidelight was the discovery that in the deepest portions of Rusinga Channel at the mouth*… and the spoken register: *There's an interesting — interesting sidelight in*

there (see Appendix J: Collocation *Interesting/Sidelight* in Academic and Spoken Contexts when MI ≥ 6).

The following Table 30 shows the collocations with MI ≥ 6 for the participial adjective *interested*. Here only 2 tokens can be selected because of a sharp decrease in frequencies after number 2. As it can be seen, both collocations are adverbs. The collocation *keenly interested* is used in all COCA registers except spoken. This collocation is psychologically strong associated because MI ≥ 6 and the *t-score* ≥ 7.5 (Durrant & Doherty, 2010).

Table 30
Collocations for *Interested*, Neutral Register, when MI ≥ 6

#	COLLOCATION	t_{score}	FREQ	ALL	%	MI
1	KEENLY	9.5	92	1056	8.71	7.27
2	ROMANTICALLY	4.4	19	467	4.07	6.17

For the participial adjectives *increasing* and *increased*, derived from transitive verbs with intransitive equivalents, the collocations with MI ≥ 6 are presented in Tables 30 and 31. The number of the collocations in every table is selected for the reason of a sharp decrease in frequencies, percentage, and/or MI.

The comparison of the following tables—Table 31 (collocations for *increasing* in the neutral register when MI ≥ 6) and Table 32 (collocations for *increased* in the neutral register when MI ≥ 6) shows some differences between these collocations and those for the same pair *increasing/increased* when MI ≥ 3. Thus, when MI ≥ 3, there are 6 similar collocations among 15 most frequent collocations for *increasing* and *increased* (see Table 23 and Table 24). In contrast, for the pair *increasing/increased* when MI ≥ 6 (see Table 31 and Table 32) there are no similar collocations among 14 most frequent collocations for *increasing* and 12 most frequent

collocations for *increased*. Also, when MI ≥ 3, nouns are in overwhelming majority among the collocations representing 42 tokens among 46 collocations for *increasing* (see Tables 23, 25, 26). Among them there are only 2 adverbs—*rapidly* and *ever*. On the other hand, when MI ≥ 6, among 12 collocations for the same participial adjective *increasing*, 2 adverbs of manner *steadily* and *exponentially* have been found (see Table 31). Nevertheless, despite some differences, in both cases—when MI ≥ 3 and when MI ≥ 6, the same predominance of nouns (all of them are inanimate) are seen among the collocations for the participial adjectives *increasing* and *increased* (see Tables 23-28 and 31-32).

Table 31
Collocations for *Increasing*, Neutral Register, when MI ≥ 6

#	COLLOCATION	t_{score}	FREQ	ALL	%	MI
1	FREQUENCY	14.45	209	10478	1.99	6.10
2	DECREASING	11.90	142	2295	6.19	7.73
3	STEADILY	19.57	112	5704	1.96	6.08
4	RELIANCE	8.11	66	3316	1.99	6.10
5	SOPHISTICATION	7.51	58	2047	2.83	6.61
6	URBANIZATION	5.82	34	1015	3.35	6.85
7	SPECIALIZATION	4.88	24	1144	2.10	6.17
8	REGULARITY	4.57	21	949	2.21	6.25
9	POLARIZATION	4.57	21	1104	1.90	6.03
10	EXPONENTIALLY	3.91	16	834	1.92	6.05
11	ENROLLMENTS	3.86	15	674	2.23	6.26
12	POLITICIZATION	3.59	13	616	2.11	6.18
13	ALERTNESS	3.30	11	505	2.18	6.23
14	RAPIDITY	3.15	10	265	3.77	7.02

Table 32
Collocations for *Increased*, Neutral Register, when MI ≥ 6

#	COLLOCATION	t_{score}	FREQ	ALL	%	MI
1	PRODUCTIVITY	13.88	193	7453	2.59	6.10
2	DECREASED	11.86	141	5234	2.69	6.16
3	INCIDENCE	10.95	120	4552	2.64	6.13
4	SUSCEPTIBILITY	6.84	47	1082	4.34	6.85
5	MORBIDITY	6.47	42	1080	3.89	6.69
6	WITHDRAWALS	4.68	22	913	2.41	6.00
7	PERFUSION	3.9	16	289	5.54	7.20
8	ABSENTEEISM	3.9	16	476	3.36	6.48
9	URINATION	3.86	15	241	6.22	7.37
10	WORKLOADS	3.73	14	287	4.88	7.02
11	RIDERSHIP	3.59	13	310	4.19	6.80
12	VIRULENCE	3.45	12	222	5.41	7.17

The application of MI ≥ 6 has revealed some rare word combination with strong associations for the participial adjectives *increasing* and *increased*. Thus, Table 31 shows a rare word combinations being used in academic writing, such as *exponentially increasing* in the contexts like …*leads to an exponentially increasing error…* (see Appendix K: Collocation *Increasing/Exponentially* in Academic Context when MI ≥ 6). Some special attention should be paid to the collocation *increased incidence* because its measure based on frequency are MI ≥ 6 and the *t-score* ≥ 7.5, that implies that the collocations is of high frequency and of strong psychological associations (Durrant & Doherty, 2010) (see Appendix L: Collocation *Increased/Incidence* in Academic Context when MI ≥ 6).

CHAPTER FIVE: DISCUSSIONS, CONCLUSIONS, AND RECOMMENDATIONS

The purpose of the current study is to compare the *–ing* and *–ed* participial adjectives and their collocations using the Corpus of Contemporary American English (COCA), to outline some morphological, syntactic, semantic, and pragmatic associations, and to suggest new ways of presenting the participial adjectives to English learners. To achieve these objectives, the present study has been organized around two research questions: the first one aims to determine the most frequently used *–ing* and *–ed* participial adjectives within the varieties of situational contexts, and the second one—to explore how the collocations of the *–ing* and *–ed* participial adjectives reflect the specific characteristics of these adjectives.

While conducting the study, the specific difficulties that the participial adjectives cause for second language learners have been taken into consideration. Thus, according to some case studies, the main difficulties in acquiring the *–ing* and *–ed* adjectival forms by SLLs are the intrinsic characteristics of the participial adjectives. First—their morphological uniqueness when the participial adjectives can have the features of verbs and adjectives (Borer, 1990; Brekke, 1988; Scovel, 1974); second—their multiple syntactic functions when the *–ing* and *–ed* verb forms can function as nouns, verbs, and adjectives (Borer, 1990; Brekke, 1988; Emonds, 1991; Folse, 2012; Gao, 1997; Horiguchi, 1983; Scovel, 1974); third—their semantic features when some participial adjectives represent 'true' adjectives indicating psychological state (e.g., *interesting/interested*), while others represent 'non-true' participial adjectives implying a change of state (e.g., *increasing/increased*) (Borer, 1990; Brekke, 1988; Emonds, 1991; Scovel, 1974).

Moreover, some difficulties in acquiring the *–ing* and *–ed* adjectival forms by SLLs are not related to the intrinsic characteristics of the participial adjectives, but belong to the issues of second language acquisition. First, it is the deficiency of saliency in the perception of the participial adjectives by second language learners (Schmitt & Zimmerman, 2002). Second, it is the interference of native language (L1) lexical, grammatical and pragmatic rules (Al-Hammad, 2002; Bahns, 1993; Bartsch, 2004; Folse, 2012; Laufer & Waldman, 2011; Nesselhauf, 2003; Webb & Kagimoto, 2011; Wolter, 2006; Wolter & Gyllstad, 2011).

As can be seen from previous research, the issue of acquiring lexical items in general and participial adjectives in particular by second language learners is the matter of high importance. Therefore, in this chapter the discussions, conclusions, and some recommendations are specified according to the abovementioned issues of acquisition of present and past participial adjectives by SLLs.

Saliency of Participial Adjectives

Saliency is "the importance of the perceived element of input" (Brown, 2007, p. 389). The least salient word categories are adjectives and lexical item formed by derivational affixes (Schmitt & Zimmerman, 2002), so it is extremely important to make participial adjectives noticeable for SLLs by explicitly emphasizing them. However, before emphasizing some particular participial adjectives, it is necessary to know what linguistic items are worth to be emphasized. One of the main criteria in selecting what linguistic items to teach is frequency (Biber & Conrad, 2001; Biber, Conrad, & Cortes, 2004; Biber, Conrad, & Reppen, 1996; Biber & Reppen, 2002; Folse, 2011; McCarthy, 2006; McGee, 2009; Shin & Nation, 2008).

Research question 1 examines the most frequent *–ing* and *–ed* participial adjectives in terms of what adjectives are worth to teach. The results of the current research have revealed the

top 20 most frequent *–ing* and *–ed* participial adjectives among total number of words in COCA database (the neutral register) (see Table 2). There the top 5 most frequent *–ing* participial adjectives are *interesting, willing, growing, following,* and *living*, and the top 5 most frequent *–ed* participial adjectives are *unidentified, concerned, involved, supposed,* and *interested*.

Yet the data on frequencies in the neutral register only may not be enough to decide what linguistic items to teach. The combined frequencies of linguistic items in the neutral register and in any specific registers applicable to some particular students' needs may be the key to selecting the necessary items for teaching (Nation, 2004; Nesselhauf, 2003; Web & Kagimoto, 2011). For example, the results of the study have shown that some *–ing* participial adjectives, such as *following, existing, increasing, growing, developing, interesting,* are most frequent in both—neutral (see Table 2) and academic (see Table 4) registers. Therefore, if SLLs are learning English for academic purposes, these particular *–ing* participial adjectives can be the ones to consider in the first instance. Tables 4, 6, 8, 10, and 12 represent the most frequent *–ing* and *–ed* participial adjectives in the academic, spoken, newspapers, magazines, and fiction registers; the items that are also present in the neutral register are highlighted.

Morphological Associations of Present and Past Participial Adjectives

Morphologically, present and past participial adjectives are presented by *–ing* and *–ed* verb forms. In ESL textbooks the participial adjectives are typically presented in *–ing/-ed* pairs as in the textbook taken as an example (Reppen, 2012). Nevertheless, according the recent study, not all participial adjectives have their corresponding *–ing* or *–ed* counterparts.

Research question 1, while considering the matter of frequencies of the participial adjectives, involves the issue of frequencies of *–ing* versus the frequencies of *–ed* participial adjectives. As the result, it has been found that among the top 20 most frequent *–ing* participial

adjectives and the top 20 most frequent *–ed* participial adjectives in the neutral register only half of them have their corresponding counterparts of comparable frequencies. These 15 pairs, with the frequencies of the counterparts at least 1 per 1 million, found among 40 *–ing* and *–ed* participial adjectives are: *interesting/interested, growing/grown, amazing/amazed, increasing/increased, exciting/excited, developing/developed, surprising/surprised, changing/changed, overwhelming/overwhelmed, missing/missed, continuing/continued, limited/limiting, tired/tiring, broken/breaking, lost/losing, advanced/advancing* (see Table 13 and Table 14). Some of the most frequent participial adjectives do not have their corresponding counterparts of comparable frequencies, such as *existing/*existed, remaining/*remained, concerned/*concerning, involved/*involving, supposed/*supposing* (see Tables 13 and Table 14).

As it can be seen, in authentic language 'single' participial adjectives predominate over pairs. The textbook presents the list of pairs of the participial adjectives, and the list is described as "some of the most common pairs of adjectives ending in *–ing* and *–ed*" (Reppen, 2012, p. 158), which is correct – these pairs (see Table 15) do represent the most frequent pairs of participial adjectives, and to introduce the concept of participial adjectives to SLLs in the particular simplified clear manner is the way to do this. Nevertheless, there is a problem with the presentation of the participial adjectives exclusively in pairs: this presentation is appropriate at low intermediate/intermediate levels, but cannot be the only one during the whole course of ESL teaching. For the SLLs at more advanced levels, the fact that a lot of the most frequent participial adjectives do not have their corresponding counterparts is worth to be introduced. However, neither in this particular textbook, *Grammar and beyond: 2* (Reppen, 2012), nor in the following textbooks of the same series for more advanced levels, *Grammar and beyond: 3* (Blass, Iannuzzi

& Savage, 2012) and *Grammar and beyond: 4* (Bunting & Diniz, 2012) the concept of 'single' participial adjectives is not presented.

One more type of the *–ing* and *–ed* participial adjectives of high frequencies that is missing in the textbooks has been found via the current research. These are the participial adjectives with prefixes: *ongoing, unidentified, so-called, unknown,* and *outstanding* (see Table 16) that are derived from transitive verbs with their intransitive equivalents (*identify, call, know*) and intransitive verbs with their transitive equivalents (*go, stand*) by adding the prefixes *on-, un-, so-,* and *out-*. What is noteworthy, is the fact that the verbs with these prefixes, such as **ongo,* **unidentify*, **so-call*, **unknow*, and **outstand* do not exist. These participial adjectives can be of both morphological forms—either *-ing* or *-ed,* yet they are always 'single', not forming the *–ing/-ed* pairs. Some of these participial adjectives are characterized by particularly high frequencies (e.g., *unidentified*, is #1 in the neutral and spoken registers with frequencies per 1 million equal correspondingly 99.20 and 468.56; *ongoing* is #8 in the academic register with frequency per 1 million equals 60.38); therefore, these *–ing* and *–ed* participial adjectives with prefixes can be considered for explicit teaching at more advanced levels.

Syntactic Associations of Present and Past Participial Adjectives

The differences between syntactic categories of participial adjectives depend on the types of the verbs from which the *–ing* and *–ed* adjectival forms are derived (Brekke, 1988; Borer, 1990; Emonds, 1991; Gao, 1997; Kitzhader, 1998; Scovel, 1974). There are two types of participial adjectives: those derived from transitive verbs of psychological state ('true' participial adjectives that take adverbial modifiers of degree such as *very*; e.g., *very interesting/interested, very surprising/surprised*) and the participial adjectives derived from transitive action verbs with

intransitive equivalents (‘non-true’ participial adjectives that do not take adverbial modifiers of degree; e.g., **very increasing/increased, *very continuing/continued*).

Research question 1 examines the frequencies of the ‘true’ participial adjectives derived from transitive verbs of psychological state (*interesting/interested, surprising/surprised*) versus the frequencies of the ‘non-true’ participial adjectives derived from transitive verbs with intransitive equivalents (*increasing/increased, continuing/continued*). The findings have proved that the ‘non-true’ participial adjectives derived from transitive verbs with intransitive equivalents dominate over the ‘true’ participial adjectives derived from transitive verbs. For example, among the top 20 *–ing* participial adjectives in the neutral register (see Table 2) only 4 are ‘true’ adjectives: *interesting, amazing, surprising,* and *exciting*, and among *–ed* participial adjectives—only 3: *concerned, interested* and *surprised*. Therefore the ‘non-true’ participial adjectives should be considered among the explicitly taught linguistic items. A special attention can be given such *–ing/-ed* pairs of high frequencies as *increasing/increased* and *continuing/continued*, and such ‘single’ participial adjectives of this type as *growing, following, living, resulting, remaining, limited, related, involved, proposed, given,* and so on (see Tables 2, 4, 6, 8, 10, 12).

However, the textbook list (see Table 15) of participial adjectives (Reppen, 2012, p. 158) considers the ‘true’ participial adjectives only. The list represents a perfect introduction to the general concept of participial adjectives at ESL lower intermediate level, yet for more advanced levels the presentation of highly frequent ‘non-true’ participial adjectives derived from transitive verbs of action with intransitive equivalents seems necessary.

Semantic Associations of Present and Past Participial Adjectives

Research question 2 asks how the collocations of the present and past participial adjectives reflect their specific characteristics. Collocations of linguistic items can be explored and taught along with their nodes (the linguistic items collocations associate with) when morphological, and/or syntactic analyses of the nodes do not bring the desirable results by not clarifying how to use the items in language. Collocations represent word associations, and the lexical rules of word associations have been supposed to be as important as the combination of syntactic and semantic rules (Bahns & Eldaw, 1993; Bartsch, 2004; Durrant & Doherty, 2010; Kennedy, 2003; McCarthy, 1984; Nesselhauf, 2003; Nesselhauf & Tschichold, 2002).

Specific semantic characteristics of the participial adjectives.

Present and past participial adjectives belong to this class of problematic lexical items: grammar explanations cannot fully clarify their semantic associations and their use. Although the semantic associations of participial adjectives stem from their morphologic and syntactic features, and can be explained in several modes, the semantic issue of the *–ing/-ed* participial adjectives remains inexplicable to SLLs over and over again. According to Scovel (1974), some of the points of the semantics of participial adjectives may even be defined as unexplainable to English learners in traditional ways because of the presence of the intuitive element in the use of participial adjectives, "evidence for this distinction between 'state' adjectives and 'eventive' intransitive verbs comes from the feeling native speakers of English express that the adjectival participles can be qualified but that the *–ing* forms of the intransitive verbs cannot" (p.309).

To exemplify the complexity of syntactic approach in clarifying the semantic associations of participial adjectives, the following three major explanations of the semantics of participial adjectives can be pointed out (Brekke, 1988; Borer, 1990; Folse, 2012; Gao, 1997; Scovel,

1974). The first explanation is given in terms of thematic roles, and aims to clarify the differences between *–ing* and *–ed* 'true' participial adjectives derived from transitive verbs of psychological state. It says that the *–ing* participial adjective implies that the subject is a creator of a state for an object (e.g., *…the elaborate dance of Jupiter's four Galilean moons is an interesting adventure* [to beholders]), while the *–ed* participial adjective indicates that the subject is a recipient of the state aroused by the object (e.g., *The opposite of somewhere is nowhere and I'm not interested in being there*, COCA, 1990-2012, http://corpus.byu.edu/coca/).

The second common explanation considers the differences between the *–ing* and *–ed* 'non-true' participial adjectives derived from transitive action verbs with intransitive equivalents. It points out that the *–ing* participial adjectives are signaling an on-going activity (e.g., *They used their political and financial power to extort increasing concessions from the emperors*) while the *–ed* adjectival forms mean resultant activity (e.g. *In addition, increased levels of global trade have resulted in greater competition*, COCA, 1990-2012, http://corpus.byu.edu/coca/).

The third approach is the analysis of the *–ing* and *–ed* participial adjectives in terms of deep and surface structures. This is the way to emphasize the double appearance of 'non-true' participial adjectives as adjectives in the 'syntactic' surface structure and as verbs in their 'semantic' deep structure, in comparison with 'true' participial adjectives that are adjectives in the surface as well as in the deep structure (Emonds, 1991; Gao, 1997; Horiguchi, 1983; Kitzhader, 1998). To clarify these explanations, the collocations for the *–ing* and *–ed* participial adjectives of these different types, being presented along with the participial adjectives, are recommended to be taught to SLLs (Folse, 2004; 2011; Kennedy, 2003; Nessehauf & Tschicholld, 2002; Shin & Nation, 2008).

Collocations reflecting the specific semantic features of the participial adjectives

To illustrate the role of collocations in teaching participial adjectives, two pairs of two different types of collocations of the highest frequency have been chosen: the pair *interesting/interested* (as the representatives of 'true' participial adjectives derived from transitive verb of psychological state) and the pair *increasing/increased* (the 'non-true' participial adjectives derived from transitive action verbs with their intransitive equivalents). The results of the current study, conducted under two conditions—when MI ≥ 3 (revealing the collocations of high frequencies with fairly strong associations) and when MI ≥ 6 (revealing the collocations of lower frequencies, yet with the strongest associations), have shown that collocations reflect the specific semantic characteristics of the participial adjectives in both cases.

As has been mentioned, the participial adjectives *interesting* and *interested* imply two different meanings. The study has shown that the collocations for *interesting* differ from the collocations for *interested*. When MI ≥ 3, among the top 15 most frequent collocations for *interesting* and 15 most frequent collocations for *interested* of total amount (neutral register) only one collocation—the adverb *particularly* is the same (see Table 17 and Table 18). Moreover, the fact that the 'true' *–ing* participial adjectives describe inanimate nouns, while the 'true' *–ed* participial adjectives describe animate nouns (Emonds, 1991; Folse, 2012) has been reflected in their collocations as well. For the *–ing* participial adjective *interesting* the collocations represent inanimate nouns: *thing, question, note, aspect, phenomenon, twist, insights, dynamics, contrast, combinations, notion, concept* (see Table 17), while the collocations for the *–ed* participial adjective *interested* represent animate nouns: *parties* (meaning *people*), *anyone, readers, scholars, researchers, persons* (see Table 18). Also, the diversity of nouns

among the collocations for both *–ing* and *–ed* participial adjectives is conspicuous. Taking into consideration that one of the main SLLs' problems in writing is the overuse of vague nouns, such as *things* and *people* (Hinkel, 2003), teaching participial adjectives along with their most frequent nouns can contribute to the learners' vocabulary development.

One more feature of the adjectives *interesting* and *interested* has been revealed: for the participial adjective *interesting* all collocating adjectives are 'true' adjectives, such as: *exciting, dynamic, challenging* (see Table 17); on the other hand, among the collocations for the participial adjective *interested*, there are no 'true' adjectives; moreover, there are no adjectives of any kind; instead, the *–ing* verbal forms that collocate with *interested*, such as *seeing, finding, hearing, buying, becoming, knowing* are gerunds (see Table 18).

Another semantic characteristic of *interesting* versus *interested* has been reflected by their collocations. The *–ing* adjective pattern is not normally used with the first person; in contrast, the *–ed* participial adjective pattern is frequently used with the first person (Folse, 2012, Scovel, 1974). Among the collocations for the *–ing* participial adjective *interesting*, the impersonal *whats* (…*whats* [*what is*] *interesting*…) has been found (see Table 17). Instead, for the *–ed* participial adjective *interested* the collocations *'m* and *am*, bound to the first person structure *I am*, have been revealed as the top 2 most frequent collocations (see Table 18).

The collocations for the participial adjectives *interesting* and *interested* obtained when MI ≥ 6 also reflect the differences between these two *–ing* and *–ed* adjectival forms. The application of MI ≥ 6 gives the opportunity to reveal rare word combinations with strong associations that can be taught to the SLLs of advanced levels. The analysis has shown that for *interesting* both collocations *tidbits* and *sidelight* are nouns (see Table 29 and Appendix I) ,

while for *interested* the associated words are two adverbs *keenly* and *romantically* (see Table 30 and Appendix J).

As to the semantics of the participial adjectives *increasing* and *increased,* derived from transitive action verb with intransitive equivalents, they imply fairly similar meaning (whether or not the event was completed), and this similarity is reflected in their collocations. When MI ≥ 3, in the neutral register, among 15 most frequent collocations for *increasing* (see Table 23) and 15 most frequent collocations for *increased* (see Table 24) there are 6 similar collocations: *demand, costs*, *pressure*, *levels, competition, awareness*. Also, both participial adjectives—*increasing* and *increased*—describe inanimate nouns such as *number*, *numbers, pressure, demand, levels, frequency, populations, interest, activity, attention*. Moreover, most of the collocations are nouns: for *increasing* all collocations are nouns, for *increased*—13 of 15 collocations are nouns.

Plus, among the collocations for *increased,* the verb *associate* of high frequency has been found. The verb may be of special interest in terms of teaching because it has the same morphologic form with the node *increased* (*-ed*) while representing the different syntactic function and different meaning of passive voice in such structures as *Eating disorders are associated with an increased risk of fractures* http://corpus.byu.edu/coca/. Here the *–ed* form of passive voice (*associated*) are next to the *–ed* participial adjective (*increased*).

The collocations for the participial adjectives *increasing* and *increased* obtained when MI ≥ 6 also reflect the similarity in meaning of these two adjectival forms. Thus, in both cases—when MI ≥ 3 and when MI ≥ 6—the same predominance of nouns (all of them are inanimate) are seen among the collocations for both adjectives—*increasing* (see Table 31) and *increased* (see Table 32). However, the application of MI ≥ 6 has exposed some differences among the collocations for *increasing* versus the collocations for *increased*: although among the

collocations for these two adjectival forms the parts of speech are almost the same—mostly inanimate nouns, there are no similar words: all nouns are different (see Tables 31, 32, and Appendixes K, L). Here, again, teaching the participial adjectives along with nouns can help overcome the overuse of vague nouns by SLLs (Hinkel, 2003).

The L1 interference is especially obvious when SLLs fail to convey the intended meaning. Teaching the participial adjectives along with their specific collocations, including the collocations of strong psychological associations, can contribute to the perceiving by SLLs the ways these adjectives are used in authentic language, and to reducing the L1 interference (Bahns, 1993; Bartsch, 2004; Laufer & Waldman, 2011; Nesselhauf, 2003; Webb & Kagimoto, 2011, Wolter, 2006, and Wolter & Gyllstad, 2011).

Pragmatic Associations of Present and Past Participial Adjectives

Research question 1 and research question 2 meet when in the issue of pragmatic associations of the participial adjectives. Research question 1 considers the varieties of the top most frequent *–ing* and *–ed* participial adjectives in different situations contexts—across registers, while research question 2 clarifies the meaning of the participial adjectives across registers in terms of their collocations.

Varieties of present and past participial adjectives across registers

For the analysis of the varieties of the present and past participial adjectives across registers, the six following registers have been considered: academic, spoken, newspapers, magazines, and fiction. The results have shown that among the top 20 most frequent *–ing* and the top 20 most frequent *–ed* participial adjectives only 8 forms are found in all six registers: *interesting, interested, willing, growing*, *living, remaining*, *concerned, used*, and the only pair of

the participial adjectives—*interesting/interested* (see Table 2, the highlighted items). The participial adjectives that are found in several registers, as the most frequent and ubiquitous, are considered to be the first to select for teaching (Nation, 2004; Nesselhauf, 2003; Web & Kagimoto, 2011).

On the other hand, all registers have some unique participial adjectives not found in the neutral register. For example, in the academic register 5 new *–ing* participial adjectives have emerged: *underlying, emerging, nursing, resulting, corresponding* (see Table 4), and 9 new *–ed* participial adjectives: *gifted, related, given, perceived, detailed, written, shared, proposed, sacred, continued, selected* (see Table 6). The new participial adjectives not found in the neutral register are represented in the following tables: the spoken register—Table 6, newspapers register—Table 8, magazines register—Table 10, and fiction register—Table 12. In the tables these new participial adjectives are not highlighted. The participial adjectives that are unique for a particular register and thus reflecting the specific features of certain situational discourse can be taught to SLLs at more advanced levels according to their needs.

Varieties of the collocations for present and past participial adjectives across registers

In terms of pragmatics, collocations are indicators of native naturalness of a linguistic discourse. This naturalness can be easily affected by the interference of L1 pragmatic rules, and this makes awareness of collocations especially important for revealing pragmatic associations of participial adjectives (Bahns, 1993; Bartsch, 2004; Laufer & Waldman, 2011; Nesselhauf, 2003; Webb & Kagimoto, 2011, Wolter, 2006, and Wolter & Gyllstad, 2011). To explore the collocations for present and past participial adjectives, two most commonly used in ESL classroom situational contexts have been selected—academic and spoken. The results have

shown that in the selected registers, academic and spoken, new collocations for the participial adjectives *interesting, interested, increasing,* and *increased* have been found. The following are the examples of some specific features of the use of the participial adjectives in different situational contexts reflected in their collocations.

Thus, the noteworthy feature in the academic register for the participial adjective *interesting* is the finding of 7 new collocations: *finding, offers, fun, insights, compare, presents, feature* (see Table 19). The unusually looking in the academic register collocation *fun* is widely used in pedagogical articles in such word combinations as *interesting fun activity* (see Appendix A). Among the collocations for *interested* in the academic register there is the presence of new gerunds *participating, pursuing, exploring* in such word combinations as *interested in pursuing, interested in exploring* (see Appendix B).

In the spoken register for the participial adjective *interested* (see Table 22) the noticeable is the replication of the adjective *interested* as its collocation. In the spoken register this recurrence indicates the colloquial repetition of the adjective, often used in two neighboring sentences: …*but I'm not interested in that. I'm interested in the facts*…. It is also used in compound and complex sentences, such as …*if Russ is interested I'm interested in helping him…, you were interested or she was interested in seeing*…. Plus, the repetition is used for emphases: … *people who are interested, actively interested in*… (see Appendix C). One more collocation is quite noticeable in the spoken register: it is the colloquial adverb of degree *terribly* which is uncommon in other registers (see Table 22).

The participial adjective *increasing* in the academic register has the high frequency collocation *decreasing* with conspicuously strong association of MI ≥ 6 and the *t-score* ≥ 7.5 (see Table 25). The collocation *increasing/decreasing* is widely presented in academic writing by the

word combinations such as …*single-case designs of increasing and decreasing intensity…* or …*increasing automation and decreasing costs of DNA sequencing* (see Appendix D). The same participial adjective *increasing* in the spoken register collocates with the preposition *under*. This preposition can be the subject of special attention because of the importance of prepositions for second language learners and difficulties in acquiring these parts of speech, especially in spoken language (Folse, 2012). The preposition *under* (see Table 26) as a collocation for the participial adjective *increasing* is frequently used in such word combinations as …*but under increasing pressure…*, …*that has come under increasing scrutiny*…, …*is coming under increasing state control*… (see Appendix E). Also, in the spoken register for the participial adjective *increasing* (see Table 26) there is the collocation *increasing* as a repetition of the node *increasing* with a particularly strong association (MI = 6.73). This recurrence is often used for emotional emphasis in such word combinations as …*that has been increasing and increasing, and therefore having a depressing effect*…, …*you know, the increasing deficits, the increasing unemployment*… (see Appendix F).

Among the new collocations in the academic register for the participial adjective *increased* (see Table 27) the preposition *due to* and the verb *resulted* can be emphasized. As it has been pointed out (Hinkel, 2003), in L2 academic writing one of the main disadvantages is the prevalence of simplified lexical structures, including inability to use appropriate verbs; as to the preposition, this part of speech is among the most difficult lexical units for SLLs' acquisition (Folse, 2012). Some verbs and prepositions that should be considered with the participial adjective *increased* in academic writing are presented in the following word combinations: …*professional development goal should lead to increased student learning*…, … *have changed significantly due to the increased use of technology*… (see Appendix G).

In the spoken register for the participial adjective *increased* the collocation *risk* is worth to be pointed out (see Table 28) because for the participial adjective *increased* it is found in all three presented registers (neutral, academic, and spoken), and in all these registers it has the highest frequencies and strongest associations (see Table 24, Table 27, Table 28). On the other hand, for the participial adjective *increasing*, the collocation *risk* is not found among the top 15 most frequent collocations. The word combinations that include the participial adjective *increased* and its collocation—the noun *risk*, is predominantly used while discussing medical topics in the phrases such as, …*awareness of the increased risk to the mother*, … *are at an increased risk of developing food allergy*…, … *will be at an increased risk for hyperthermia*… (see Appendix H). Also the diversity of the prepositions used with the collocation *increased/risk* is noticeable: three prepositions are used with this word combination: *to, of,* and *for*.

One of the collocations for the participial adjective *interested* when MI ≥ 6 and the *t-score* ≥ 7.5 is the collocation *keenly* (see Table 30). The word combination *keenly interested* is used in all COCA registers except spoken. For example, in the academic register it can be found in such sentences as *Chinese archaeologists are keenly interested in Por-Bajin because of the high level of preservation* (COCA, 1990-2012, http://corpus.byu.edu/coca/). The collocation *romantically interested* is used in all COCA registers including academic, in such fields as Anthropology and Ethnology: *He suspected his boss of being romantically interested in her, she said. From the women's point of view*… (COCA, 1990-2012, http://corpus.byu.edu/coca/).

The application of MI ≥ 6 and the 2 ≤ *t-score* ≤ 7.5 has revealed some rare word combination with strong associations for the participial adjectives *increasing* (see Table 31), such as *exponentially increasing* that is used in academic writing (see Appendix K), and for the participial adjective *increased* (see Table 32) in the contexts like … *it leads to an exponentially*

increasing error… Another infrequent collocation for the participial adjective *increased* (see Table 32) with strong association when MI ≥ 6 and the 2 ≤ *t-score* ≤ 7.5 is the collocation *increased perfusion* which is found in the academic register in such word combinations as, *…the increased perfusion noted with increased surface pressure…* One more collocation that is worth to mention is the word combination *increased incidence* with relatively high frequency and strong association (see Appendix L). Such rare word combinations with strong psychological associations can be taught to SLLs at advanced levels according to their needs.

Pedagogical Implications

In teaching lexical items the combination of deductive and inductive methods has been recommended by a number of researchers. Thus, according to Siyanova and Schmitt (2008) as well as Webb and Kagimoto (2009), the deductive method can be effectively applied to a limited amount (18-24 in the study) of lexical items through explicit exposure in context via cloze tasks and reading. However, explicit instruction is not sufficient in the contemporary, corpus-based second language learning. The inductive method should also be applied via extensive repeated exposure of the SLLs to language in use through corpus linguistics, especially to collocations in meaningful contexts (Folse, 2004, 2011; Kennedy, 2003; Nessehauf & Tschicholld, 2002; Shin & Nation, 2008).

Based on the current study of present and past participial adjectives in the Corpus of Contemporary American English (COCA), the following pedagogical implications can be specified and suggested. First, for the explicit teaching the list of the top 20 most frequent *–ing* and *–ed* participial adjectives can be considered (see Table 2). Furthermore, taking into consideration the needs of SLLs (e.g., academic English), the participial adjectives found in both—neutral and academic registers should be given some special attention (Nation, 2004;

Nesselhauf, 2003; Web & Kagimoto, 2011) (see highlighted items in Tables 2, 4, 6, 8, 10, 12). For more advanced SLLs the participial adjectives that are specific for particular registers and are not found in the neutral register may be the matter of interest (see the items that are not highlighted in Tables 2, 4, 6, 8, 10, 12). Also, the fact that not all participial adjectives have their corresponding *–ing* or *–ed* counterparts should be explicitly pointed out for SLLs at more advanced levels (see Tables 13, 14).

Second, to contribute to the understanding of present and past participial adjectives, these adjectival forms should be taught along with their collocations (Biber, Conrad, & Cortes, 2004; Biber, Conrad, & Reppen, 1998; Folse, 2004, 2011, 2012; Hinkel, 2003; McCarthy, 1984) (see Tables 17, 18, 23, 24). The collocations that are found not only in the neutral register should be presented to SLLs according to their learning goals (Nation, 2004; Nesselhauf, 2003; Web & Kagimoto, 2011) (see the items that are not highlighted in Tables 17-28). Furthermore, some special attention may be paid to the collocations with stronger associations when the value of their mutual information is close to six (Bartsch, 2004; Durrant & Doherty, 2010) (see the underlined items in Tables 17-28). For more advanced SLLs, the participial adjectives with their collocations that are specific for particular registers and are not found in the neutral register may be the matter of interest (see the highlighted items in Tables 17-28). In addition, the rare collocations with strong associations when MI $\geq$ 6 can be introduced to advanced SLLs, especially the collocations with the *t-score* $\geq$ 7.5 (Durrant & Doherty, 2010) (see Tables 29-32).

The collocations can be taught via the combination of the explicit (while introducing the most frequent lexical items) and implicit (during extensive repeated exposure to larger number of collocations through corpus linguistics) methods. The examples of the situational contexts for some collocations of the participial adjectives *interesting*, *interested*, *increasing*, and *increased*

can be found in the present study in Appendixes A-L. As a result of this approach, the *-ing* and *–ed* participial adjectives may become less confusing for second language learners when being taught along with their collocations in relation to their frequencies, and being presented in the varieties of contexts through corpus linguistics.

The data supplied by this study can be helpful to design teaching materials, curricula, and creating new ESL textbooks. The information is helpful for adding to the list of the *–ing* and *–ed* participial adjectives presented in ESL textbooks as well as for presenting some of the most frequent participial adjectives along with their collocations in certain varieties of contexts of authentic language. These implications would give second language educators the opportunity to teach those participial adjectives and collocations that are most frequently used in contemporary American English.

Areas for Further Research

The current study has provided many opportunities for future corpus-based research of present and past participial adjectives and their collocations in terms of pedagogical implications. This study has determined the top 20 most frequent *–ing* and *–ed* participial adjectives across six COCA sections-registers (neutral, academic, spoken, newspapers, magazines, fiction) and the occurrence of their corresponding counterparts. The present study has also analyzed the collocations for two pairs of participial adjectives: *interesting/interested* and *increasing/increased* as the representatives of two types of participial adjectives with different intrinsic characteristics: the first type derived from transitive verbs of psychological state (*interest*), the second—from transitive verbs of action with intransitive equivalents (*increase*). Their collocations have been considered in three registers: neutral, academic, and spoken. In

addition, several examples of the use of some studied collocations in the context of authentic language have been provided in Appendixes.

Therefore, because the present study has looked in detail only at two pairs of participial adjectives (*interesting/interested* and *increasing/increased*), the other present and past participial adjectives from the list of the top 20 most frequent participial adjectives should be the subjects for further research in terms of their morphologic, syntactic, semantic, and lexical characteristics as well as pedagogic implications. The following types of lexical items should be considered: first—the present and past participial adjectives that do not have their counterparts comparable in frequencies, such as *following, living, existing, remaining, leading, working, running, concerned, involved, supposed, used*; second—the high frequency participial adjectives with prefixes, such as *ongoing, unidentified, so-called, unknown, outstanding*. Moreover, the high frequency participial adjectives that have the *–y* forms instead of *–ing*, such as *scared/scary* should also be considered for further research.

As to the pragmatic issue of the use of present and past participial adjectives along with their collocations within certain varieties of contexts, the current study has looked only at three particular registers: neutral, academic and spoken. Therefore, more registers represented in COCA, such as newspapers, magazines, and fiction should be taken into consideration. Some special attention may be paid to the fiction register because the data for the spoken register were obtained from radio and TV talk shows. Although unscripted, the talk shows were the conversations of the people who knew that they were on the air, and therefore their dialogues did not represent an unaffected colloquial discourse. Exploring the fiction register along with spoken would introduce new participial adjectives and their collocations rendering the naturalness and

vividness of the colloquial discourse of contemporary American English reflected in American fiction written from 1990 to 2012.

One more area meriting further research is the analysis of the most troublesome lexical items, such as the adverbs of degree, nouns, and prepositions that collocate with participial adjectives. The problem is that among all possible adverbs of degree, SLLs use mainly one—the adverb *very*, and among nouns (especially in academic writing)—mainly two vague nouns *things* and *people* while having constant difficulties with the use of prepositions (Folse, 2004, 2012; Hinkel, 2003). Further research may therefore wish to study the collocations geared to these troublesome lexical items. The results would provide second language learners with explicit data of authentic language in use that, presented in teaching materials, would offer certain opportunities for SLLs to achieve native-like performance.

Finally, to provide distinct strategies for different levels of SLLs—from lower intermediate to advanced— more textbooks have to be reviewed in relation to corpus-based findings. In these reviews not only the presentation of *–ing* and *-ed* participial adjectives should be considered, but also the arrangement of vocabulary, the illustration of the use of prepositions, and the exemplification of authentic texts related to present and past participial adjectives and their collocations should become the subjects for further research.

APPENDIX A: COLLOCATION *INTERESTING/FUN* IN ACADEMIC CONTEXT WHEN MI ≥ 3 (COCA http://corpus.byu.edu/coca/)

Collocation *Interesting/Fun* in Academic Context when MI≥3

YEAR	SECTION, or REGISTER	FIELD or SOURCE	CONTEXT
2011	ACAD	TechEngineerTeacher	nanotechnology. # Interactive websites are also available for teachers to provide students **fun** and **interesting** ways to learn more about nanotechnology. The National Nanotechnology Initiative, found at **28;44513;TOOLONG
2011	ACAD	Physical Educ	ego-driven and task-driven, and present it in a way that would be **fun**, **interesting**, and engaging " (p. 148). Therefore, a bouldering wall curriculum
2011	ACAD	TeachLibrar	students to apply knowledge and make decisions related to animal adaptation in a **fun** and **interesting** way. # TEACHING Professional educators will be supported individually and in teams by technology
2011	ACAD	Education	going to get a lot more out of the lesson if it's **fun** and **interesting**. " # Theme Self-assessment: # Sample Response " I can easily point out
2011	ACAD	StudiesInEducation	of entertainment and education -- in the sense that parents are to find the programme **interesting** and **fun** at the same time as they learn about topics such as how to
2009	ACAD	TeachLibrar	* Digital natives are most likely to pay attention to information that is **fun** and **interesting**. This finding relates to informational content as well as to the way information is
2009	ACAD	Education	. There are some educational software packages available that make constructing concept maps **fun** and **interesting**. One of those is known as Inspiration (version for middle and secondary grades

APPENDIX B: COLLOCATION *INTERESTED/PURSUING* IN ACADEMIC CONTEXT WHEN MI ≥ 3 (COCA http://corpus.byu.edu/coca/)

Collocation *Interested/Pursuing* in Academic Context when MI≥3

YEAR	SECTION, or REGISTER	FIELD or SOURCE	CONTEXT
2011	ACAD	MechanicalEng	to support them in the enjoyment of their lives. # FOR MORE INFORMATION Readers **interested** in **pursuing** the subject covered in this article will find links to more information at
2011	ACAD	MechanicalEng	North American universities, provides the ASME-IPTI with feedback as to the needs of students **interested** in **pursuing** careers in the oil &; gas industry. The Council's award-winning benefit
2011	ACAD	SocialWork	Social work, like other health care fields, is facing a paucity of individuals **interested** in **pursuing** practice with older adults (Cummings, Adler, &; DeCoster, 2005
2009	ACAD	DrugIssues	would have a broad reach to current drug abuse researchers as well as to those **interested** in **pursuing** this challenging and interesting field as a career. The presenters at the
2009	ACAD	MechanicalEng	with manufacturing processes and can expedite the training of workers. For More Information Readers **interested** in **pursuing** the subject covered in this article will find links to more information at
2008	ACAD	ForeignAffairs	them to put more economic pressure on Iran. These countries have been far more **interested** in **pursuing** profit than preventing proliferation. They must realize that if the United States
2007	ACAD	Bioscience	might be affected by their work. For example, a rural sociologist might be **interested** in **pursuing** theoretical (i.e., basic) knowledge about the impact of large resource
2007	ACAD	MechanicalEng	in an era of rapid change and expanding knowledge. # For More Information Readers **interested** in **pursuing** the subject covered in this article will find links to more information at

APPENDIX C: COLLOCATION *INTERESTED/INTERESTED* IN SPOKEN CONTEXT WHEN MI ≥ 3 (COCA http://corpus.byu.edu/coca/)

Collocation *Interested/Interested* in Spoken Context when MI≥3

YEAR	SECTION, or REGISTER	FIELD or SOURCE	CONTEXT
2012	SPOK	NBC_Matthews	? He changed completely after two years as governor because he began **interested** -- became **interested** in running for president or at least following through on a long interest on that
2000	SPOK	ABC_Special	, even in our interview, he did confirm that he was **interested** in somehow **interested** in making a foray into television with George. And again, I think that
2011	SPOK	Fox_Baier	States Senate and such a close friend, that if Russ is **interested** I'm **interested** in helping him. BROWN: But one Wisconsin political watcher says last fall's re-
2003	SPOK	SNN_King	And my family on my mom's side particularly was very **interested** in, was **interested** in making sure I didn't feel too spoiled or… KING: That was
2010	SPOK	NPR_TellMore	and Harvard University published today, found that 80 percent of black Democrats are as **interested** or more **interested** in the midterms than they were in the 2008 presidential election,
2007	SPOK	CBS_48 Hours	leave. MORIARTY: Did you break up because you were **interested** or she was **interested** in seeing other people? Mr-HAUGHN: Not on my part. I don't
2007	SPOK	Fox_Sustaeren	just went away. Mostly -- in terms of people who are **interested**, actively **interested**, at least, there is some concern that -- the fact of the pictures

APPENDIX D: COLLOCATION *INCREASING/DECREASING* IN ACADEMIC REGISTER WHEN MI ≥ 3 (COCA http://corpus.byu.edu/coca/)

Collocation *Increasing/Decreasing* in Academic Context when MI≥3

YEAR	SECTION, or REGISTER	FIELD or SOURCE	CONTEXT
2012	ACAD	EducationTreatment	). Response to intervention: Empirically based special service decisions from single-case designs of **increasing** and **decreasing** intensity. Journal of Special Education, 38, 66-79. # Bartels
2011	ACAD	JSpeechLanguage	function of age is consistent with Kail and Salthouse's (1994) finding of **increasing** and **decreasing** processing speed as a function of age in a cognitive task, with
2010	ACAD	Bioscience	1990s with polymerase chain reaction (PCR) amplification of targeted sequences in genomes; **increasing** automation and **decreasing** costs of DNA sequencing; and other technologies, such as microsatellite
2010	ACAD	Statistical Methods	and power formulations of the test give an alternative hypothesis where the intensities are monotonically **increasing** or **decreasing** in time. This means that the test may be poor at identifying
2010	ACAD	Statistical Methods	. Both these models are quite restrictive as they constrain all intensities to be monotonically **increasing** or **decreasing** depending on the sign of f or a. Recent work by Hubbard
2008	ACAD	ForeignAffairs	each will require progress on that front. Interestingly, that prospect seems to be **increasing**, not **decreasing**, with the democratic invol

APPENDIX E: COLLOCATION *INCREASING/UNDER* IN SPOKEN CONTENT WHEN MI ≥ 3 (COCA http://corpus.byu.edu/coca/)

Collocation *Increasing/Under* in Spoken Content when MI≥3

YEAR	SECTION, or REGISTER	FIELD or SOURCE	CONTEXT
2010	SPOK	ABC_ThisWeek	up, number one. Number two, an important part of this bill is **increasing** payments **under** Medicaid to primary care physicians. We're gon na create more primary
2010	SPOK	CBS_NewsEve	the Tea Party generating intense excitement on the political right, the president is **under** **increasing** pressure to fire up the liberal base. In an interview in this weeks "
2009	SPOK	ABC_Nightline	jail that Sheriff Joe is quite proud of. But one that has come **under** **increasing** scrutiny for its treatment of the prisoners there. PRISONER-1MARICOP# This is disgusting. I
2008	SPOK	ABC_Nightline	critics say those numbers are vastly overstated. Recently, the church finds itself **under** **increasing** attack. ANNOUNCER-1INTERN# Anonymous has therefore decided that your organization should be destroyed. LISA-FLETCHER-1-A#
2008	SPOK	NPR_TellMore	internally last December, with the defeat of a constitutional referendum. He's **under** **increasing** criticism because of very acute food shortages of basic food stuffs, despite the country
2007	SPOK	PBS_Newshour	Stephen Schwartzman of Blackstone, and for their investors. But theyve also come **under** **increasing** fire from a growing number of lawmakers, who worry about a lack of oversight
2003	SPOK	NPR_Morning	same way. SHEETS: Volkenstein notes TV, for instance, is coming **under** **increasing** state control. Russia's last independent nationwide television network closed this summer. VCIOM

APPENDIX F: COLLOCATION *INCREASING/INCREASING* IN SPOKEN CONTEXT WHEN MI ≥ 3 (COCA http://corpus.byu.edu/coca/)

Collocation *Increasing/Increasing* in Spoken Context when MI≥3

YEAR	SECTION, or REGISTER	FIELD or SOURCE	CONTEXT
2010	SPOK	NPR_TalkNation	is in health care benefits, and that has, that has been **increasing** and **increasing**, and therefore having a depressing effect, relatively speaking, on wages. And
2009	SPOK	ABC_ThisWeek	any other specific politicians. You had people like Ronald Reagan **increasing** taxes, and **increasing** spending by 13%. You had Wilson increase taxes. You had Deukmejian increase taxes
2009	SPOK	PBS_Newshour	1,200. Youd look at seven years in a row of **increasing** test scores and **increasing** graduation rates, reducing the dropout rate. JOHN-MERROW: But he was not successful
2009	SPOK	Fox_Hannity	he earned it to this point? You know, the **increasing** deficits, the **increasing** unemployment. The kind of lackadaisical approach on foreign affairs. The president, there
2007	SPOK	CNN_King	area of Pakistan. They continue to communicate, in fact with **increasing** frequency and **increasing** quality. They continue to fight. They continue to instruct. They have changed
2000	SPOK	PBS_Newshour	, but certainly we're headed down the path with the **increasing** commercial visibility and **increasing** number of people attached. We've seen these sorts of attacks building up over
2000	SPOK	CNN_WorldNews	with these economies trying to rebound that, if they have **increasing** oil prices and **increasing** fuel prices, not just for motorists, but for the economies as well,

APPENDIX G: COLLOCATION *INCREASED/DUE* IN ACADEMIC CONTEXT WHEN M ≥ 3 (COCA http://corpus.byu.edu/coca/)

Collocation *Increased/Due* in Academic Context when MI≥3

YEAR	SECTION, or REGISTER	FIELD or SOURCE	CONTEXT
2012	ACAD	Teaching Exceptional	Technology # Methods of teaching and learning within college have changed significantly **due** to the **increased** use of technology. Students with LD and/or ADD/ADHD can choose the types of classes
2012	ACAD	Futurist	anticipate population growth as retirement meccas, will likely experience more premature deaths **due** to **increased** pollution and traffic accidents. # Models for studying the range of trends and impacts
2012	ACAD	American Secondary	Research studies show that students in high-need schools are more likely to suffer **due** to **increased** teacher turnover with less qualified teachers than students who do not attend high-need schools (
2012	ACAD	PracticeNurse	in pregnancy can vary a great deal. Only some of it is **due** to **increased** body fat - with most of the weight gain being accounted for by the unborn
2012	ACAD	PracticeNurse	although they also slightly increase LDL). Rosiglitazone was withdrawn **due** to concerns about **increased** stroke risk, leaving only pioglitazone in this group of drugs. Glitazones are usually
2011	ACAD	Archaeology	people were walking for three days through the Sonoran Desert. Now, **due** to **increased** enforcement, they are walking five days. And there's just no physical way
2011	ACAD	Bioscience	plant germination is often greatest along the shoulders of roads. It is possible that **increased** runoff **due** to impervious pavement or compacted soil contributes to this heterogeneity of vegetation in

APPENDIX H: COLLOCATIONS *INCREASED/RISK* IN ACADEMIC CONTEXT WHEN MI ≥ 3 (COCA http://corpus.byu.edu/coca/)

Collocations *Increased/Risk* in Academic Context when MI≥3

YEAR	SECTION, or REGISTER	FIELD or SOURCE	CONTEXT
2012	ACAD	PracticeNurse	or allergic disease (at least one affected parent or sibling) are at an **increased risk** of developing food allergy.4 Exclusive breastfeeding for the first 6 months may be protective
2012	ACAD	PracticeNurse	# The presence of asthma in a child with peanut allergy, is associated with **increased risk** of a severe reaction, and good asthma control is essential. Deaths from
2012	ACAD	PracticeNurse	weight, but obesity may affect the efficacy of some contraception.12 # Awareness of the **increased risk** to the mother and unborn child of obesity among women of reproductive age is
2012	ACAD	PracticeNurse	life. # OPTIMAL WEIGHT GAIN High and low pre-pregnancy BMI put a pregnancy at **increased risk**. The components of normal weight gain during pregnancy are outlined in Box 2
2012	ACAD	PracticeNurse	a five-fold increase in the **risk** of severe hyperglycaemia, and a more than sevenfold **increased risk** of significant hypoglycaemia (from 0.4 to 3 events per 100 people per month
2012	ACAD	PracticeNurse	high alcohol intake or cardiac events such as myocardial infarction, and there is an **increased risk** among the elderly, those with diabetes, hypertension, smokers and patients with
2012	ACAD	EnvironmentalHealth	a bid to identify small molecules in blood plasma and related pathways that predict an **increased risk** for major cardiovascular events such as heart attacks. By studying samples from 150

APPENDIX I: COLLOCATION *INTERESTING/TIDBITS* IN ACADEMIC AND SPOKEN CONTEXTS WHEN MI ≥ 6 (COCA http://corpus.byu.edu/coca/)

Collocation *Interesting/Tidbits* in Academic and Spoken Contexts when MI≥6

YEAR	SECTION, or REGISTER	FIELD or SOURCE	CONTEXT
2009	ACAD	TeachLibrar	well as to the way information is presented. Digital natives expressed preference for learning **interesting tidbits**, along with current events. This provides local libraries the opportunity to be
2003	SPOK	CNN_Talkback	indication Baghdad is going to give them any further information. Some of the more **interesting tidbits** here: ElBaradei, of the International Atomic Energy Agency, is saying that
2002	SPOK	CNN_SunMorn	for Elvis. And they'll provide, I'm sure, a lot of **interesting tidbits**, and it also provides a forum for people to ask questions of the
1999	SPOK	NPR_Science	questions. Mr-LINDLEY: That's right. Been trying to work up some pretty **interesting** little **tidbits** here. FLATOW: Well, here on the line with us,
1999	ACAD	AfricanArts	. Besides attracting visitors with compelling images of African art, these sites often offer **interesting tidbits** of collection data and background information about some of their pieces. (n9)
1992	SPOK	CBS_Morning	wondering what happened on this date in sports history, we have a couple of **interesting tidbits**. The first baseball game under the lights was played on April 28th,

APPENIDIX J: COLLOCATION *INTERESTING/SIDELIGHT* IN ACADEMIC AND SPOKEN CONTEXTS WHEN MI ≥ 6 (COCA http://corpus.byu.edu/coca/)

Collocation *Interesting/Sidelight* in Academic and Spoken Contexts when MI≥6

YEAR	SECTION or REGISTER	FIELD or SOURCE	CONTEXT
2009	ACAD	MechanicalEng	the situation was not quite as simple as we are led to believe. An **interesting sidelight** is that Whitney casually invented, as a tool for manufacturing gun locks,
1999	SPOK	NPR_Science	that name, " They Saw the Elephant. " There's an interesting -- **interesting sidelight** in there -- published by the University of Oklahoma Press in 1992, and
1996	SPOK	CBS_Special	like. SCHIEFFER: You know, John, one -- one kind of little **interesting sidelight** here. The Associated Press is now saying there was only one death that
1995	SPOK	ABC_Brinkley	emissaries to sign the United Nations charter and to bring it into being. And **interesting** little **sidelight** I've just come across: some of those who were there to
1992	ACAD	Bioscience	. Adult Nile perch themselves are probably not tolerant of prolonged hypoxia. # One **interesting sidelight** was the discovery that in the deepest portions of Rusinga Channel at the mouth
1990	SPOK	PBS_Newshour	. So the President was more optimistic than the King. MR-MacNeil: As an **interesting sidelight** Llyod shipping intelligence reports in London that Jordanian Port Authorities in Aqaba had forces

APPENDIX K: COLLOCATION *INCREASING/EXPONENTIALLY* IN ACADEMIC CONTEXT WHEN MI ≥ 6 (COCA http://corpus.byu.edu/coca/)

Collocation *Increasing/Exponentially* in Academic Context when MI≥6

YEAR	SECTION, or REGISTER	FIELD or SOURCE	CONTEXT
2011	ACAD	ReferenceUserServices	of the' big shift' where the information universe is expanding at an **exponentially increasing** rate and, as a result, many of the jobs of today will no
2010	ACAD	Bioscience	a null model that incorporates constant introduction and establishment rates, leading to an **exponentially increasing** cumulative number of non-indigenous forest pests (Wonham and Pachepsky 2006). # When
2006	ACAD	Bioscience	2006), it is imperative to assess the future of seagrasses under the **exponentially increasing** pressures of human growth and development in the watersheds and coastal zones of the world
2001	ACAD	IBMR&D	loading of triphenylsulfonium triflate (TPSOTf). The rate becomes **exponentially** smaller with an **increasing** TPSOTf concentration, especially when the rate is high. Figure 7 indicates that the
1998	ACAD	PhysicsToday	field is the inverse of the conductivity profile, which means it decreases **exponentially** with **increasing** altitude, implying a net space charge in the air. The model of the
1995	ACAD	Psychology	predictability. In chaotic systems, the error in initial measurements leads to an **exponentially increasing** error in predictions as possible systems diverge. However, this is not the same
1995	ACAD	IBMR&D	inductance and resistance for these interconnections. It is shown that such lines have **exponentially increasing** propagation delay with line length. Moreover, the high wiring density and fast signal-switching

APPENDIX L: COLLOCATION *INCREASED/INCIDENCE* IN ACADEMIC CONTEXT WHEN MI ≥ 6 (COCA http://corpus.byu.edu/coca/)

Collocation *Increased/Incidence* in Academic Context when MI≥6

YEAR	SECTION, or REGISTER	FIELD or SOURCE	CONTEXT
2012	ACAD	EnvironmentalHealth	associated with increasing risk of obesity (Barcenas et al. 2007). The **increased incidence** of chronic disease after rural -- urban and international migration, relative to source
2012	ACAD	Emerging Infectious	population. This model accurately simulated Hib **incidence** in all 3 populations, including the **increased incidence** in England/Wales beginning in 1999 and the change in Hib **incidence** in Alaska Natives
2011	ACAD	SocialWork	the loss of interaction with family and friends, which is significantly associated with an **increased incidence** of depression among Chinese immigrant elders. # Coping Resources # Many previous studies
2011	ACAD	PracticeNurse	antiepileptics to the mother may outweigh the risk to the fetus, there is an **increased incidence** of congenital malformation in infants born to mothers receiving antiepileptic drugs. # There
2011	ACAD	OccupationalHealth	One such control was identified following skin inspection, when the OH nurse spotted an **increased incidence** of irritant dermatitis within the company. Following Liaison with management, the cause
2010	ACAD	EnvironHealth	Pentagon response has not been associated with physical morbidity. # Several reports cite an **increased incidence** of cardiovascular morbidity following the 9/11 terrorist attacks (Allegra, Mostashari, Rothman
2010	ACAD	EnvironHealth	behaviors (Herron et al., 2008). We have no evidence of an **increased incidence** of anxiety disorders in the deployed dogs (Otto et al., 2004)

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