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PHRASAL VERBS IN TED TALKS:
A CORPUS ANALYSIS

BY

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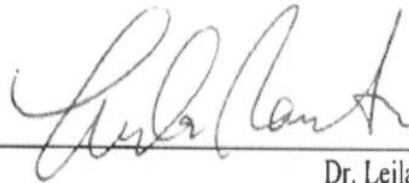<div align="right">

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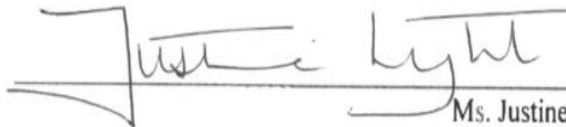CANADA

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FACULTY OF GRADUATE STUDIES AND RESEARCH

The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies

and Research, a Project Report entitled "Phrasal Verbs in TED Talks: A Corpus Analysis"

submitted by Zahida Sharmin in partial fulfillment of the requirements for the degree of

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Abstract

Researchers have been exploring phrasal verbs (PV) for a few decades now; the complex nature of PVs, their high frequency and productivity in conversation and fiction, and the challenges they pose to learners and teachers account for linguists' interest in this type of verb. One area in which PV researchers have made considerable progress is in creating frequency lists based on corpus analyses. The latest is a register-specific PV frequency list developed by Liu and Myers (2018), referred to as the Spoken and Academic Writing Phrasal Verb Pedagogical (S&A W PHaVE) List. To date, there has been no investigation into the representation of PV frequency lists in authentic teaching materials used in English for academic purposes (EAP) classrooms. The present study examined a TED Talks corpus (adapted from Coxhead and Walls, 2012) with respect to (1) PV frequency and (2) PV coverage using the Liu and Myer's list. The findings revealed that on average, there is one PV in every 124 words in the corpus and that more than half of the PVs (62.73%) correspond to those in the S&A W PHaVE List. This PV frequency list representation suggests EAP instructors should utilize such lists when selecting authentic aural materials.

English for Academic Purposes (EAP) has emerged as a separate branch from the larger body of English for Specific Purposes and has traditionally been associated with university level learning (Hyland and Hamp-Lyons, 2002). Flowerdew and Peacock (2001) define EAP as "teaching English with the specific aim of helping learners to study, conduct research or teach in that language" (p. 8). In general, EAP programs provide students opportunities to improve their academic listening, speaking, reading, and writing skills. Students in the EAP programs often constitute English as a second language (ESL) learners from different countries around the world. At the University of Alberta, the EAP program is "designed to meet the English language proficiency requirement for undergraduate admission at the University of Alberta" and thereby teaches students how to "synthesize and analyze information from a variety of sources, including academic journals and lectures, as well as materials from more popular sources" (Faculty of Extension, English Language School, University of Alberta). In the process of addressing the academic needs of ESL learners, the programs may undervalue their objective of "equipping students with the communicative skills to participate in particular …cultural contexts" (Hyland and Hamp-Lyons, 2002). ESL students in EAP programs not only need to learn "cognitive academic language proficiency" but also "basic interpersonal communicative skills" (Cummins, 1981, p.133) to interact with native speakers in the community. This need provides the backdrop to the present investigation of phrasal verbs (PVs) in EAP instructional materials.

Phrasal verbs are multiword verbs that consist of lexical verbs combined with adverbial particles. For example, in the sentence "Did you point out the faults?", *point out* is a phrasal verb that functions as a single verb; lexical verb *point* is followed by the adverbial particle *out* in this PV construction. Although PVs are very frequently used and highly productive in the

English language, it is widely agreed that they are not easy to acquire (Celce-Murcia & Larsen-Freeman, 1999; Darwin & Gray, 1999). They pose problems not only for ESL learners with non-Germanic first languages (Celce-Murcia & Larsen-Freeman, 1999) but also for advanced learners, especially those who learn English in a foreign language learning (EFL) situation in the classroom (Wray, 1999). What complicates the situation further is that teachers may also be confused about PV pedagogy (Darwin & Gray, 1999) due to the semantic and grammatical complexity of PVs. There is, however, growing clarity about which PVs are the most frequent and therefore the most useful for teachers to expose their students to or to explicitly teach. These frequency lists originate from five corpus analysis studies conducted by Biber, Johansson, Leech, Conrad and Finegan (1999), Gardner and Davies (2007), Liu (2011), Garnier and Schmitt (2015), and Liu and Myers (2018). The Spoken and Academic Writing PHrasal VErb Pedagogical List (S&A W PHaVE List) by Liu and Myers (2018), which was modeled on Garnier and Schmitt's (2015) PHrasal VErb Pedagogical List (PHaVE List), is the latest register-specific corpus-based frequency list for instructional purposes. This list includes high frequency PVs with information on their key meaning senses in two registers.

Despite the growth of PV corpus-based research, to the best of my knowledge, there has been no investigation into the occurrence of PVs in authentic teaching materials currently used in EAP classrooms. During my practicum in the Faculty of Extension at the University of Alberta, I observed an EAP145 class which consisted of 18 students from China. EAP145 is a two-month intensive course with classes from Monday to Friday and focuses on developing students' critical thinking and teaching presentation skills in oral and written forms. The textbooks used in the course place emphasis on developing academic listening, academic reading, and academic writing. In addition to the textbooks, authentic resources are used to

enhance students' language skills. In classes that I observed each student was asked to watch a TED Talk related to the topics in the prescribed textbooks as an out-of-class assignment and to present the content in a condensed form orally in the following class. Since PVs are not commonly associated with the academic register, there is a high probability that the textbooks in the EAP courses may not be rich in PVs. Hence, students' exposure to PVs in the academic setting might be limited to the additional authentic resources like TED Talks. Therefore, I chose to examine how frequently PVs appear and to what degree the PVs from the S&A W PHaVE List occur in TED Talks. Although my study is exploratory and descriptive in nature, the findings may raise EAP instructors' awareness of PV frequency in the authentic target language input they use in the classroom.

Literature Review

There has been extensive research over the decades on different features of PVs. The existing PV research can be classified into three streams: 1) the description, frequency and usage patterns of PVs, 2) the mental representation and processing of PVs, and 3) learning and teaching of PVs. As it is well beyond the scope of this capping project to address this wide range of scholarship in detail, I limit this review to the scholarship that is most relevant to my study. In the first section, I provide the definition and classification of PVs and in the second, I survey the corpus-based research on the frequency of PVs in oral and written language. This is followed by a brief discussion of TED Talks as a pedagogical resource.

Definition and Classification of Phrasal Verbs

Definition. Linguists have been arguing over the definition and classification of PVs for decades due to their syntactic peculiarity (i.e., particle movement possibility of some PVs) and semantic complexity (i.e., highly idiomatic meanings of some PVs) (Dagut & Laufer,

1985). However, for the purpose of my study, I adopt the functional definition used by Gardner and Davies (2007) who do not attempt to distinguish and classify PVs based on the semantic transparency. Their definition includes all literal and figurative meanings of PVs and resonates with the definition proposed by Quirk, Greenbaum, Leech, and Svartvik (1985). According to Gardner and Davies (2007), PVs are all two-part verbs consisting of a lexical verb (LV) proper followed by an adverbial particle (AVP) "that is either contiguous (adjacent) to that verb or noncontiguous (i.e., separated by one or more intervening words)" (p. 341).

It is important to note that PVs are one type of multi-word verbs; other multi-word verbs include prepositional verbs and phrasal-prepositional verbs (Biber, Conrad, & Leech, 2002). PV constructions are distinct from prepositional verbs which consist of verbs followed by prepositions. Celce-Murcia and Larsen-Freeman (1999) provide the following examples to demonstrate the difference between a preposition and a particle:

She *walked up* the street to get a bite to eat.

When are you going to *clean up* your room?

In the first sentence, *up* is the preposition in the adverbial prepositional phrase of direction *up the street* while in the second sentence, *up* is syntactically optional and contributes modestly to the meaning of the second sentence; therefore, *walk up* is considered as a prepositional verb as opposed to *clean up* which is a phrasal verb (Celce-Murcia & Larsen-Freeman, 1999).

Classification. Syntactically, PVs may be transitive (e.g., Harold *turned on* the radio) or intransitive (e.g., *Go off* to bed now) (Biber et al., 1999; Celce-Murcia & Larsen-Freeman, 1999; Quirk et al., 1985). Transitive PVs can be distinguished from other multi-word verbs (i.e., prepositional verbs, phrasal-prepositional verbs) by particle movement: transitive combinations allow the placement of particles either before or after the objects but if the object

is a pronoun, the particle appears almost always after the object (e.g., I *took* them *off*) (Biber, Conrad & Leech, 2002). Intransitive PVs, on the contrary, are "activity verbs that are used as directives … [and] often occur as imperatives" (Biber et al., 2002, p. 128).

Semantically, Celce-Murcia and Larsen-Freeman (1999) discern three categories of PVs: literal, idiomatic, and aspectual. The first category is the least difficult for ESL/EFL students to master as the particle retains its prepositional meaning (e.g., *sit down*, *climb up*, *pass through*). In contrast to literal PVs, the second category, idiomatic PVs have meanings that are not related to the meanings of lexical verbs or particles (e.g., *give up*, *make up*). In the third category, aspectual PV, the lexical verb retains its meaning while the particle contributes meaning about the verb's aspect (e.g., *eat up*, d*rink up*).

Research on the Frequency of Phrasal Verbs

Biber et al. (1999). The earliest corpus-based study on PVs was conducted by Biber and colleagues for the *Longman Grammar of Spoken and Written English*. They focused on 31 high frequency PVs and arranged them in a list in terms of seven semantic domains (activity intransitive, activity transitive, mental transitive, communication transitive, occurrence intransitive, copular, and aspectual intransitive) across four registers: conversation, fiction, newspaper, and academic prose. Their findings indicated that PVs were prevalent in conversation and fiction, but were rare in academic prose. However, the number of PVs analyzed in their study was very small and there was no comparison between the 31 high frequency PVs and other PVs.

Gardner and Davies (2007). Gardner and Davies (2007) attributed the limitations of Biber et al.'s (1999) study to space constraints and the larger purposes of the *Longman* reference grammar. Recognizing the need for "more focused and expanded data analyses" (p.

343), Gardner and Davies (2007) analyzed the British National Corpus for high frequency PVs. The aim of their study was to determine what PVs to teach, based on frequencies of actual occurrences in the British National Corpus, not how to teach them. Gardner and Davies (2007) discovered a total of 518,923 PVs with 1,572 LV lemmas[1] in the British National Corpus. The megacorpus analysis shows that 20 lexical verbs combined with eight adverbial particles account for more than half (53.7%) of the PV occurrences in the British National Corpus (p. 349). Gardner and Davies' (2007) study eventually resulted in a list of 100 PVs consisting of 20 PV-producing lexical verbs. This frequency-based list of PVs were argued to be more practical and useful from a teaching and learning perspective than the random groups of PVs teachers may select by intuition (Gardner and Davies, 2007).

Liu (2011). Using the studies of Biber at al. (1999) and Gardner and Davies (2007) as a starting point, Liu (2011) compared the high frequency PVs in American and British English and examined PV usage across five registers (spoken, fiction, magazine, newspaper, and academic writing) in American English. In his study, Liu (2011) analyzed the Corpus of Contemporary American English for frequencies of the most common PVs and compared his results with those presented in Biber at al. (1999) and Gardner and Davies (2007). He found no substantial difference between the two corpora in terms of PV frequency and cross-register usage. What emerged from Liu's (2011) investigation was that 27 of the 31 PVs in Biber et al. (1999) overlapped with those in Gardner and Davies' (2007) list of 100 PVs. Therefore, Liu (2011) searched those 104 PVs in the Corpus of Contemporary American English and identified 48 additional high frequency PVs in the process[2]. This finding suggests that PV use has remained fairly stable for more than two decades. Like Biber at al. (1999), Liu (2011) drew

the same conclusion that PVs are more common in fiction and spoken English than magazines, newspapers, and academic writing.

Liu (2012). Liu (2012) investigated the most common multi-word constructions in the academic writing sub-corpora of the Corpus of Contemporary American English and British National Corpus. PVs were included as one category of multi-word constructions in this study; other multi-word constructions that were studied included lexical bundles, idioms, and prepositional verbs. Although the study did not aim to provide exclusive information on PV frequency, this was one of the first studies that shed light on PV usage in academic writing. Based on the investigation, Liu (2012) generated a list of 228 most frequently used multi-word constructions in British and American general academic written English, organized by frequency and semantic function.

Garnier and Schmitt (2015). Although all four of the aforementioned studies contribute significantly to corpus-based PV research, pedagogically they may be inadequate in one respect: none of the analyses addressed the semantic aspects of PVs. Gardner and Davies (2007) pointed out that PVs possessed multiple meanings; on average each PV in their list had 5.6 meaning senses[3]. Therefore, mastering the PVs in the lists of Gardner and Davies or Liu entailed learning 560 to 840 form-meaning links, not just 100 or 150 lexical items (Garnier & Schmitt, 2015). PV dictionaries (paper and online versions) and lexical databases also present an overwhelming amount of information under each single PV entry. In response to this problem, Garnier and Schmitt (2015) aimed to reduce the total number of meaning senses of the most frequent PVs to a manageable number for learners and teachers.

The PHaVE List generated by Garnier and Schmitt (2015) included Liu's (2011) 150 high frequency PVs in the Corpus of Contemporary American English with information on

their key meaning senses. For the key meaning senses, Garnier and Schmitt (2015) read a total

of 200 randomly sampled concordance lines of each PV. These concordance lines were

representative of all the tokens[4]. In their list, Garnier and Schmitt (2015) incorporated only the

meaning senses that accounted for a large proportion of occurrences by setting an upper

threshold of 75% (i.e., meaning senses account for at least 75% of all occurrences of the

specific PV) and a lower threshold of 10% (i.e., meaning senses account for at least 10% of all

occurrences of the specific PV). In addition, Garnier and Schmitt (2015) illustrated each

meaning sense definition with an example sentence of their own creation. Because of these

characteristics, the PHaVE List may be considered as the first comprehensive corpus-based

frequency list for teaching and learning purposes.

Liu and Myers (2018). The study by Liu and Myers (2018) was fundamentally an

extension of Garnier and Schmitt's (2015) work; what Liu and Myers (2018) added was the

comparison of the meaning distributions of the most common PVs in two registers, spoken and

academic writing. Since Garnier and Schmitt (2015) developed the PHaVE List for a general

purpose, they did not provide information about register-specific key meanings of the 150 high

frequency PVs. Building on this work, Liu and Myers examined the various key meanings of

the most frequently used PVs in the spoken and academic writing sub-corpora of the Corpus of

Contemporary American English and they read 600 tokens of each PV in each register to find

the key meaning senses. Their rationale for choosing these two registers is twofold: first,

ESL/EFL learners are mostly expected to learn spoken English and written academic English,

and second, these are the 'two ends of the language formality continuum' (Liu & Myers, 2018,

p. 5).

Liu and Myers' corpus analysis shows that the semantic usage distributions of 70% of PVs from the PHaVE List differ significantly between spoken and academic writing. This finding emphasizes the importance of registers in learning the key meaning senses of polysemous PVs. In the end, Liu and Myers generated the S&A W PHaVE List which was modeled on Garnier and Schmitt's (2015) PHaVE List. This list comprises all 150 PVs from the PHaVE List with meanings and example sentences as used in spoken and academic writing registers.

Alangari, Jaworska, and Laws (2019). Since PVs are often considered as stylistically inappropriate in formal registers and are generally disapproved in academic writing, research on PV usage by expert academic writers has been limited (Alangari, Jaworska, & Laws, 2019). Previous studies on PVs in formal writing (e.g., Trebits, 2009; Liu & Myers, 2018) explored only two-word PVs. Identifying the gap, Alangari, Jaworska, and Laws (2019) investigated the use of PVs and other types of phrasal-prepositional verbs in expert academic writing in the field of linguistics. An important aspect of their study was the comparison between the frequencies of PVs and the frequencies of other verb categories in the corpus (Alangari, Jaworska, & Laws, 2019).

The Academic English Corpus created by Alangari, Jaworska, and Laws (2019) consists of 130 articles selected from nine English journals that focused on language teaching, sociolinguistics, discourse studies, and theoretical linguistics, published between 2014 and 2016. The results contradicted the previous findings that had shown that PVs were rare in formal registers (Biber et al., 1999; Liu, 2011). Alangari, Jaworska, and Laws' (2019) analysis demonstrated that PVs constituted a large portion of verbs in recent academic writing in Linguistics and the findings imply that a range of PVs are now acceptable in academic

contexts, albeit the meanings of the most common PVs in academic writing are restricted and different from general use to some extent. For example, *take up* is commonly associated with fiction and less with academic writing (Liu, 2011); yet this PV was found as one of the most frequent PVs in the Academic English Corpus. Garnier and Schmitt (2015) listed four meaning senses of this PV in general use in order of frequency:

1. Use a particular amount of space, time or effort (25.5%)

2. Discuss or deal with (issue, idea, matter) (17.5%)

3. Starting to do a particular job or activity (10.5%)

4. grasp an object, moving it from a lower to a higher position (10%)

What Alangari, Jaworska, and Laws discovered was that *take up* meant "discuss or deal with" in academic writing in 41% cases. A close examination reveals a pattern in the usage and meaning of this PV: in the Academic English Corpus, the subjects of *take up* are commonly animate which include words like *writers*, *interviewees*, *subjects*, pronouns and proper nouns. In case of inanimate subjects, *paper*, *article*, *chapter*, and *section* occupy the subject positions whereas the objects of *take up* indicate the activity of discussion (e.g., *questions*, *negotiations*, *argument*, and *challenge*). Based on their results, Alangari, Jaworska, and Laws (2019) produced a list of PVs in the Academic English Corpus and their frequencies, organized by types and tokens. Since this list constitutes PVs in academic written English, it extends Liu and Myers' (2018) work which is at the core of my project. In conducting the semantic analysis of PVs in the corpus, I compare the meanings of PVs in spoken English with those in written academic English.

TED Talks as Authentic Material in EAP

Despite the construction of PV frequency lists for pedagogical purposes, the extent to which these frequencies are reflected in authentic teaching materials used in EAP classes has yet to be investigated. For this study TED Talks were selected for analysis due to their observed pedagogical use in EAP classes.

TED stands for Technology, Entertainment, Design and is a nonprofit organization that welcomes people from every discipline and culture to engage with ideas in the form of short talks (typically between four and 20 minutes) with the aim "to change attitudes, lives, and ultimately, the world" (TED Talks, 2019). The online platform showcases freely available conference presentations on topics ranging from technology, entertainment, design to science, business and global issues in more than 100 languages (TED Talks, 2019).

The growing popularity of TED Talks has spread to English language education and the talks are now being increasingly used in EAP classrooms for academic listening, public speaking, and critical reading as evidenced in the publication of textbook series and the development of online courses (Wingrove, 2017). National Geographic Learning collaborated with TED in 2014 and published *World English* textbook series (Milner, Chase, & Johannsen, 2015); furthermore, the Keynote series (National Geographic Learning, 2019) won the British Council ELTons award for excellence in course innovation in 2016 (English Agenda, 2016). Nevertheless, it is the dearth of authentic aural target language input in most EAP textbooks that may account for instructors' preference for TED Talks which are representative of dynamic English short talks (Leopold, 2016).

The Present Study

The aim of the present study is to examine whether the high frequency PVs with their most common meaning senses that have been identified in corpus research occur in the aural

target language input provided by TED Talks. To carry out this analysis, I modified an existing TED Talks corpus developed by Coxhead and Walls (2012). The following research questions were addressed in this study:

1. Which PVs occur in the adapted TED Talks corpus?

2. Do the PVs in the adapted TED Talks corpus correspond to those in the S&A W PHaVE List?

3. Do the meaning senses of the most frequent PVs in the adapted TED corpus correspond to those in the S&A W PHaVE List?

Method

The Adapted Corpus of TED Talks

This study made use of the TED Talk corpus developed by Coxhead and Walls (2012). They called their corpus "six by six", referring to the length of time (i.e., six minutes) and subject areas represented (i.e., technology, entertainment, design, business, science, global issues). This TED corpus consists of 60 talks from six subject areas, with 10 talks from each category. TED Talks have different ranges in terms of length: 3, 6, 9, 12, and 18 minutes (TED Talks, 2019). Coxhead and Walls (2012) took the length of the class time (e.g., one hour) into consideration in selecting six-minute talks, since teachers often play the audio files twice in the classroom. But the researchers also pointed out that "six minutes" is not a particularly strict category in TED Talks; consequently, the ten talks in each topic area varied in length, ranging from 400 running words to nearly 1000 (Coxhead & Walls, 2012). To have a more balanced corpus, I have substituted the talks that were less than four minutes long with those that were closer to six minutes in length. The list of talks in the adapted corpus is presented in Appendix A; the titles that I substituted are in bold. I replaced three talks in Business, one talk in Design,

three in Entertainment, three in Global Issues, six in Science, and five in Technology due to their length. It may be noted that there was one talk, "Robots that show emotion" delivered by David Hanson which appeared in both Design and Entertainment in Coxhead and Walls' (2012) original TED corpus. I decided to replace this talk in the Design category with Romain Lacombe's "A personal air-quality tracker that lets you know what you're breathing". Therefore, 22 talks in total were substituted in the adapted TED corpus. It may be noted that, following Coxhead and Walls' (2012) procedure, I did not discriminate between native and non-native speakers of English in selecting talks for the corpus. Speakers' language status has not been a factor in my selection criteria. Table 1 presents the summary of the adapted TED corpus.

Despite the measures taken to substitute talks that were deemed too short, the six categories in the adapted TED corpus still emerged as uneven to a certain degree. It may be perceived from the summary of the corpus that the length of time and the number of running words do not correspond. Although the Business category has the minimum length of total talk time (54.30 minutes), it consists of the highest number of running words (10,152). The category of Technology, on the other hand, lasts the longest (62.18 minutes) but contains 8,484 running words. Similarly, the Entertainment category comprises the lowest number of running words (7,620) in spite of its one-hour total length. This trend parallels that of Alami, Sabbah and Iranmanesh (2013) who found that the shorter the amount of time a person spoke, the more lexically dense the speech was, and the longer a person spoke, the less lexically dense. Lexical density refers to the percentage of lexical items or content words (e.g., nouns, verbs, adjectives, and adverbs) within a span of words and is calculated by dividing the number of lexical items by the number of total words (Alami, Sabbah, & Iranmanesh, 2013). Therefore, the longer

length of talk may not ensure a greater number of running words. Since my goal was to examine the PV frequency in the adapted Coxhead and Walls' (2012) corpus, not to create a well-balanced corpus, I decided to disregard this inconsistency in the number of running words in the six categories and analyze them in their existing condition.

Table 1

The Adapted TED Talks Corpus

Category	Number of Talks	Length of Talks (min.)	Running Words
Business	10	54.30	10,152
Design	10	56.48	8,340
Entertainment	10	60.11	7,620
Global Issues	10	56.18	8,385
Science	10	60.47	9,682
Technology	10	62.18	8,484
Total	60	350.52	52,663

Analytic Procedure

For the data analysis, I employed the concordance function of Wordsmith Tools 7.0 to identify all the verb + adverbial particle combinations. I checked the *Lexico Dictionary online*, the *Cambridge Dictionary online* and the *Cambridge Phrasal Verbs Dictionary* to confirm PV formations. For semantic analyses, I primarily consulted Liu and Myers' (2018) S&A W PHaVE List to identify the key meanings of PVs in the TED corpus. In addition, I employed the above mentioned dictionaries to cross-check the PVs' meaning senses.

The data analysis included several stages. First, I separated the transcripts of the talks into six text files by each subject area. Next, I extracted all the adverbial particles (AVP) from the S&A W PHaVE List and categorized the PVs by particles in a separate list (see Appendix B for the re-organized PV list). In total, there were 13 particles noted in the S&A W PHaVE List. Afterwards, I used the software to search for the particles in each text file. Following Gardner and Davies' (2007) method, I checked if the particle was immediately adjacent to the lexical verb (LV+AVP), within two words (LV+X+AVP), or within three words (LV+X+X+AVP). Tagging one to three words to the left of the particles enabled me to identify the preceding lexical verbs that paired up with the particles to form phrasal verbs and to eliminate the prepositional verbs in the process. For example, in *figure out* the LV (i.e., *figure*) and AVP (i.e., *out*) are next to each other as there is no other word between them, so the construction is simply LV+AVP. But in *figure this out*, the word *this* comes between LV and AVP; hence, it is marked as LV+X+AVP. Similarly, *figure all that out* is marked as LV+X+X+AVP. I searched for up to three words preceding particles to identify the PVs on the concordance lines. An advantage of tagging the particles is that the concordance lists produce all the inflectional forms of the same verb (e.g., *bring, brings, brought* for the verb BRING).

Since proficient speakers of English have a conceptual metaphorical understanding of particles, they often create new PVs that might not be listed in dictionaries and might be perceived as confusing. For example, the word *text* may be used as a noun or as a verb, and there is no phrasal verb entry for the lexical verb *text* in either *Cambridge Phrasal Verbs Dictionary* or *Lexico Dictionary online*. But in the TED corpus, one of the speakers uses the word in his sentence, "We are now *texting out* to about 200,000 kids a week about doing our campaign to make their schools more green or to work on homeless issues and things like that"

(Lublin, 2012). In such cases, I adhered to Gardner and Davies' (2007) definition of PVs and classified them accordingly. As long as one of the dictionaries identifies a verb + adverbial particle as a PV, I marked it as such. For example, *Cambridge Phrasal Verbs Dictionary* and *Lexico Dictionary online* recognize only *add up* and *add up to* as PVs for the lexical verb *add*, but *Cambridge Dictionary online* includes a third PV for *add* which is *add in*. Therefore, in my analysis, *add in* is classified as a phrasal verb.

In the following step, I entered the frequency data in an Excel spreadsheet to calculate percentages. Once I prepared a list of the most frequently used PVs, I put them in another table with their meanings in context and compared manually whether the meaning senses corresponded to those in the S&A W PHaVE list. It may be noted that I checked all the tokens of each high frequency PV for the meaning senses and compared the key meaning senses with those in spoken English. I focused particularly on the spoken register to check the meaning senses because TED Talks belong to that register. Finally, I created a list of the 10 most frequent PVs with their meaning senses in the TED corpus and the meaning senses described in the S&A W PHaVE List.

Results

Research shows that learners will encounter, on average, one PV in every 150 words in the British National Corpus, albeit this exposure estimate will vary in different registers (Gardner & Davies, 2007). The findings of my study are supportive of that approximation; results of the TED corpus analysis display 424 PVs among 52,663 running words; 266 of these PVs match with those in the S&A W PHaVE List. On average, there is one PV in every 124 words in the corpus. This indicates that PVs are highly frequent in TED Talk speech. Considering the fact that PVs are commonly associated with spoken language (Liu, 2011), this

slightly higher exposure estimate of PVs in English short talks is not unexpected. However, it may be noted that PV usage varies by talks and categories. For example, in the Business category, Tom Wujec's speech and Gary Kovacs' speech have the same length (1,091 running words), but the PV usage in Kovacs' speech is double the number of PVs used in Wujec's speech. Consequently, there is one PV in 364 words in Wujec's speech while there is one PV in 182 words in that of Kovacs. There are also talks where PV usage is either non-existent (e.g. Rob Reid) or nearly non-existent (e.g., Jacek Utko, Monica Bulaj). S&A W PHaVE representation is the highest in Entertainment (69.09%) and lowest in Technology (54.54%) as is shown in Table 2, which presents the details of PV usage in the six categories.

Table 2

PVs in the TED Corpus

Category	# of Running Words	# of PVs	# of S&A W PHaVE PVs	% of S&A W PHaVE PVs
Business	10,152	77	50	63.93
Design	8,340	64	38	59.37
Entertainment	7,620	55	38	69.09
Global Issues	8,385	58	35	60.34
Science	9,682	104	69	66.34
Technology	8,484	66	36	54.54
All	52,663	424	266	62.73

Initially, I listed the most frequently used PVs in the TED Talks corpus and found that 17 PV types[5] encompassed 141 tokens. This finding suggests 17 PVs account for one third

(33.25%) of the PVs in the TED corpus. Apart from one PV, *let down*, all 16 PVs correspond to the PVs in S&A W PHaVE List. Upon close examination, I discovered that all six tokens of *let down* appeared in one talk, "The world's English mania" in the category of Global Issues (Walker, 2009). During his talk, Walker (2009) presents an audio clip where the students in China repeat after the teacher the following lines:

T: I don't want to let my parents down!

S: I don't want to let my parents down!

T: I don't ever want to let my country down!

S: I don't ever want to let my country down!

T: Most importantly... S: Most importantly...

T: I don't want to let myself down!

S: I don't want to let myself down!

Therefore, *let down* may be considered as an isolated case in the corpus and may not be tagged as a frequently used PV despite the high number of tokens.

Appendix C presents the 10 most frequently used PVs with their major meaning senses in the TED corpus and their key meaning senses in the spoken register as described in the S&A W PHaVE List. *Come up* is the most frequently used PV in the TED Talks corpus. In the S&A W PHaVE List, Liu and Myers (2018) listed four major meaning senses of *come up* and their percentages in the speaking register:

1. Be happening soon (62.5%)

2. Bring forth or produce (13.2%)

3. Move close to (typically the speaker) (12.7%)

4. Arise or come to light (11.4%)

Nevertheless, the key meaning senses of *come up* occurring in the TED corpus are "bring forth or produce" (50%) and "move close to" (28.57%). An analogous pattern was observed in case of *go out*. The key meaning sense of *go out* and its percentage in speaking as described in the S&A W List is "go on a date or to a specific location (42.5%)". The least frequent meaning of *go out*, on the other hand, is "take the field or go on a mission, often with a specific goal in mind (10.1%)". Interestingly, in the TED Talks corpus, *go out* was mostly (37.5%) used in the sense of "take the field or go on a mission, often with a specific goal in mind" as illustrated in the concordance lines in Figure 1. These differences in major meaning senses of PVs suggest that learning at least two or three major meaning senses is essential for learners to understand the usage of polysemous PVs.

... their full potential. Let's	go out	and build it. Thank you.
Oh my God! We have got to	go out	there and clean this thing up. So I actually …
I didn't have the money to	go out	and buy a plane. So I decided to build a computer…

Figure 1: Concordance lines of *go out* in the sense of "take the field or go on a mission, often with a specific goal in mind"

Figure out, on the other hand, has one meaning sense (i.e., come to understand or determine something) in all 13 tokens and the meaning sense matches with the key meaning sense in both spoken and academic written registers in the S&A W PHaVE List. It is the second most frequently used PV in the TED corpus and appears in all categories except Global Issues. This PV occurs in diverse forms such as *figure out, figured out, figure it out, figure this out, figure all that out, figure themselves out*, and *figuring it out* in the corpus. Similar results in meaning senses are noticed in case of *find out*, *pick up*, *turn out, open up, go on, come back,*

and *end up*. The meaning senses of these PVs correspond to the major meaning senses in the spoken register in the S&A W PHaVE List.

Although the major meaning senses of 80% of the high frequency PVs in the TED corpus correspond to the key meaning senses and usage percentages described in the spoken register in the S&A W PHaVE List, a few high frequency PVs use less common meaning senses in the TED corpus.

Discussion

The results from the analysis of PVs in the corpus of TED Talks reveals that PVs are pervasive in authentic monologic speech in which a speaker is presenting information to a broad audience. Although the results of this analysis might suggest that TED Talks would be useful for developing EAP students' knowledge of PVs, from a pedagogical viewpoint, this is unlikely due to the fact that only a limited amount of instructional time is usually devoted to listening to TED Talks. In a short intensive course like the University of Alberta's EAP 145 class, students may listen to and present on no more than three talks. Thus, PV exposure from these talks is not particularly rich and would not provide sufficient opportunities for *incidental learning* to take place. This refers to learning as a by-product of an activity that primarily revolves around meaning (Hulstijn, 2003). Research has shown that vocabulary items need to be encountered many times before they are learned incidentally. Indeed, Brown, Waring, and Donkaewbua (2008) estimate that more than 20 encounters in aural input are needed for incidental learning to occur. Despite the relatively high number of PVs on average in the TED Talks corpus, merely watching/listening to TED Talks alone is not enough.

Instead, teachers need to create opportunities for *intentional learning*. This refers to rehearsal and memorizing techniques invoked by learners when they have the explicit intention

of learning and retaining lexical information (Schmitt, 1997). Teachers need to select suitable talks that contain PVs and then create activities that focus students' attention on learning this vocabulary. For example, teachers can present students with language data from the corpus, in the form of selected lines from a concordance list (i.e., a list of all the occurrences of a particular word in the corpus). This data-driven activity can provide students opportunities to explore the structures and meanings of PVs in authentic language use. This activity can be followed by traditional exercises like gap-filling and replacing one-word verbs with PVs. In addition, instructors may list out lexical verbs that correspond to the LVs in the S&A W PHaVE list and direct students' attention to the pairing of LVs and adverbial particles in PV constructions. Despite the large number of LVs used in the talks, only a limited number of LVs are repeated in PV constructions throughout the corpus. Recognizing the LVs that form PVs may raise students' awareness of PV usage in the aural input. Alternately, teachers can create a list of PV particles with their meanings and draw attention to the fact that PVs are "a combination of two separate meanings - one coming from the meaning of the verb…and one coming from the particle" (Spring, 2018, p.122). Spring (2018) created a comprehensive, yet concise list of particles with major meanings which can be used in teaching PVs in parts than as whole units.

Teachers should exploit the information from frequency lists for intentional learning. Post-listening activities can target the 16 most frequently used PVs with their major meaning senses for the TED Talks corpus analyzed in this project; by doing so, students would gain an understanding of one-third of the PV usage in this particular corpus. Considering that a number of high frequency PVs display multiple meaning senses in different contexts, it is

recommended that students learn at least two to three major meaning senses of each high frequency PV to fully comprehend the usage in context.

Although ESL learners can acquire PVs incidentally through aural input, output activities might be more effective in the retention of word-meaning. Summing up the content orally after the first exposure to the text can positively influence learners' vocabulary gains from audiovisual input (Nguyen & Boers, 2019). Since PVs used in TED Talks corpus are accepted in formal settings, students can be encouraged to use them in their oral presentations. Other output tasks that have been found effective in the learning of PVs include collaborative tasks such as reconstruction cloze tasks and reconstruction editing tasks (Nassaji & Tian, 2010).

Conclusion

One of the limitations of my study was the small size of the corpus. A larger corpus with longer stretches of speech would allow researchers to make more precise observations about PV frequency and usage. In addition, I focused exclusively on PV occurrence in TED Talks, and it was beyond the scope of my research to observe how PVs are approached by practitioners and learners in the EAP classroom; neither did I compare PV frequency in TED Talks with PV frequency in other authentic aural texts (e.g., speeches delivered by political or historical figures like Abraham Lincoln or Martin Luther King) that EAP instructors sometimes use in the classroom. More research in the first area would reveal how instructors and learners address incidental learning of PVs and how much PV knowledge students retain from exposure to authentic spoken input. Further research in the second area would clarify PV frequency and usage in various kinds of academic presentations. The findings may serve as a

basis for the compilation of teaching materials and designing of syllabi to increase students' awareness of lexical features in authentic spoken input.

My analysis demonstrates that phrasal verbs are frequently used (one PV in every 124 words on average) in the "six-by-six" TED Talks corpus. Therefore, these talks resemble conversation and fiction rather than academic texts in terms of their PV profile. The results also show that close to two-thirds (62.73%) of these PVs are the same as those in the S&A W PHaVE List. In terms of semantic information, the high frequency PVs may have a number of different meanings depending on the context in which they are used. It may be concluded from the findings of the study that PV frequency lists predict to a moderate degree PV usage in at least one widely used source of authentic aural English and therefore such lists should be exploited by EAP instructors in addressing students' PV learning needs.

Notes

1. Lemma refers to all inflectional forms (e.g., look, looks, looking, looked) of a word class or part of speech. Unlike word families which include words from different parts of speech, lemmas do not accept members from different parts of speech. Therefore, the verb *analyze* and the noun *analysis* are two separate lemmas, but both *analyze* and *analysis* belong to the same word family.

2. Liu's list consisted of 150 PVs instead of 152 because he combined two related pairs of synonymous PVs in the final list.

3. Garnier and Schmitt (2015) use "meaning senses" to refer to the multiple meanings of PVs in specific contexts. Liu and Myers (2018, p.16) clarify the terminology by creating the following example:

   <u>Break up</u>

   <u>Major meanings and their percentages in speaking</u>

   Sense 1: End or cause STH to end or fail, esp. relationships (76.8%)

       Ex: Karen's marriage **broke up**.

   Sense 2: Divide into smaller parts or components (20%)

       Ex: They wanted to **break up** the large percentage of poor people and move them to different places.

4. Token is an individual occurrence of a linguistic unit in speech or writing.

5. Type refers to a category or class of linguistic item or unit, as distinct from actual occurrences in speech or writing.

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The Adapted TED Talks Corpus

Note: The titles of the substituted talks are in bold letters

Topic Area	Talk Title	TED Talker
Business	*3 things I learned when my plane crashed*	Ric Elias
	3 ways to measure your adaptability	Natalie Fratto
	Build a tower, build a team	Tom Wujec
	The tradeoffs of building green	Catherine Mohr
	Doodlers, unite!	Sunni Brown
	Looking for a job?	Jason Shen
	The single biggest reason why start-ups succeed	Bill Gross
	The day I turned down Tim Berners Lee	Ian Ritchie
	Tracking our online trackers	Gary Kovacs
	What's wrong with our food system	Birke Baehr
Design	***Wearable tech that helps you navigate by touch***	Keith Kirkland
	A next-generation digital book	Mike Matas
	Animating a photo-real digital face	Paul Debevec
	A robot that flies like a bird	Markus Fischer
	Can design save newspaper?	Jacek Utko
	Grow your own clothes	Suzanne Lee
	A personal air-quality tracker	Romain Lacombe
	Shake up your story	Raghava KK
	Wearing nothing new	Jessi Arrington
	Free or cheap Wii remote hacks	Johnny Lee
Entertainment	*Building US-China relations…by banjo*	Abigail Washburn
	And for my next trick, a robot	Marco Tempest
	How books can open your mind	Lisa Bu
	A teen just trying to figure it out	Tavi Gevinson

Technology	*Should we create a solar shade to cool the earth?*	Danny Hilli
	A magic topic with augmented reality	Marco Tempest
	Building blocks than blink, beep and teach	Ayah Bdeir
	Crowdsource your health	Lucien Engelen
	How to avoid surveillance…with the phone in your pocket	Christopher Soghoian
	What if all US health care costs were transparent?	Jeanne Pinder
	Human exoskeletons - for war and healing	Eythor Bender
	Meet Rezero, the dancing ballbot	Peter Fankhauser
	How augmented reality is changing activism	Glenn Cantave
	What it's like to live on the international space station	Cady Coleman

Appendix B

S&A W PHaVE List by Particles

OUT	**IN**	**UP**	**OFF**	**ABOUT**
Bring out	Bring in	Back up	Break off	Bring about
Break out	Come in	Blow up	Come off	Come about
Call out	Fill in	Break up	Cut off	Set about
Carry out	Get in	Bring up	Get off	**BACK**
Check out	Give in	Build up	Go off	Bring back
Come out	Go in	Catch up	Pay off	Come back
Figure out	Move in	Clean up	Put off	Get back
Fill out	Put in	Come up	Set off	Give back
Find out	Take in	End up	Take off	Go back
Get out	**ON**	Follow up	Turn off	Hold back
Give out	Carry on	Get up	**DOWN**	Look back
Go out	Come on	Give up	Break down	Move back
Hang out	Get on	Go up	Bring down	Pull back
Hold out	Go on	Grow up	Close down	Put back
Lay out	Hang on	Hang up	Come down	Sit back
Look out	Hold on	Hold up	Get down	Step back
Make out	Keep on	Keep up	Go down	Take back
Move out	Move on	Line up	Lay down	Turn back
Pick out	Pass on	Look up	Look down	
Point out	Put on	Make up	Put down	
Play out	Take on	Move up	Set down	
Pull out	**THROUGH**	Open up	Settle down	
Put out	Come through	Pick up	Shut down	
Reach out	Get through	Pull up	Sit down	
Rule out	Go through	Put up	Slow down	
Run out	**OVER**	Set up	Take down	
Send out	Come over	Show up	Turn down	
Set out	Go over	Shut up	Write down	
Sort out	Hand over	Sit up	**AROUND**	
Stand out	Take over	Stand up	Come around	
Start out	Turn over	Sum up	Go around	
Take out	**AHEAD**	Take up	look around	
Throw out	Go ahead	Turn up	turn around	
Turn out	ALONG	Wake up		
Walk out	Come along	Wind up		
Work out	Go along			

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Appendix C

The Most Frequently Used PVs in the TED Talks Corpus

PVs	Number of Tokens	Key Meaning Senses and their % in Speaking	
		TED Talks	S&A W PHaVE List
Come up	14	Bring forth or produce (50)	Be happening soon (62.5)
Figure out	13	Come to understand or determine STH (100)	Come to understand or determine STH (100)
Find out	12	Discover STH; get knowledge of STH (100)	Discover STH; get knowledge of STH (100)
Pick up	12	Get or take STH/SB from a place (66.6)	Get or take STH/SB from a place (44)
Turn out	12	Prove or be discovered to happen or be (100)	Prove or be discovered to happen or be (91)
Open up	9	Become or make STH available or possible, less limited (66.6)	Become or make STH available or possible, less limited (52.4)
Go on	8	Happen/take place (62.5)	Happen/take place (76.2)
Go out	8	Take the field or go on a mission, often with a specific goal in mind (37.5)	Go on a date or to a specific location (42.5)
Come back	8	Return to a place or a conversation topic (100)	Return to a place or a conversation topic (96.5)
End up	8	Finally do STH or be in a particular place, state, or situation after doing STH or as a result of it, especially unexpectedly (100)	Finally do STH or be in a particular place, state, or situation after doing STH or as a result of it, especially unexpectedly (100)