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AN ABSTRACT OF THE THESIS OF Robert D. Pierce for the Master of Arts in
TESOL presented September 19, 1990.

Title: Phrasal Verbs in Academic Lectures

APPROVED BY MEMBERS OF THE THESIS COMMITTEE:

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Phrasal verbs are a pervasive and distinctly Germanic part of the spoken English language that has been alive for centuries. They have preceded American history, and yet considered to be "the most active and creative pattern and word formation in the American language" (Meyer, 1975). Distinctly colloquial, idiomatic and varying in shades of literalness and figurativity, phrasal verbs are largely dominant in casual usage, such as

conversation, while the Latinate verbs of English are dominant in formal usage, such as in making reports (McArthur 1989). While foreign educators and their students, such as from Chinese countries, are found to emphasize English study for formal and academic purposes, the acquisition of phrasal verbs may not be considered instrumental to the purposes of the students coming to the United States in pursuit of academic degrees.

Because of the pervasiveness of phrasal verbs in spoken English language, and because of the largely conversational nature of American lectures, this study is intended to answer the following research questions:

1. In university classrooms, are the phrasal verbs spoken by native English speaking lecturers?
2. Are figurative phrasal verbs in academic lectures significantly greater in frequency than non-figuratively classified phrasal verbs in the academic lectures?
3. Do certain academic subjects tend to generate a significant increase in the number of phrasal verbs spoken by instructors, of either figurative phrasal verbs, or the more literal non-figuratively classified phrasal verbs?

The results of the study establish that phrasal verbs are statistically significant in spoken frequency by lecturers in American classrooms who are native speakers of English, and that there are significantly more of the figurative phrasal verbs in American academic lectures, especially in the analyzed lecture sample. Due to inadequate numbers of academic subjects analyzed, it was not established whether or not specific courses generated a significantly larger number of particular varieties of phrasal verbs.

PHRASAL VERBS IN ACADEMIC LECTURES

by

ROBERT D. PIERCE

A thesis submitted in partial fulfillment
of the requirements for the degree of

MASTER OF ARTS
in
TESOL

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1990

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Robert D. Pierce

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CHAPTER I

INTRODUCTION

This study examines phrasal verbs (idiomatic multi-word verbs with semantically unpredictable meanings) that occur in American university lectures. It focuses on academic courses which are in particular demand among non-native English speakers. The implications of the research are considered with relation to a particular population of non-native speakers of English whose literary approach to the study of English may leave phrasal verbs largely neglected -- the Chinese student population (such as from China, Taiwan and southeast Asia).

BACKGROUND FOR THIS STUDY

Extensive linguistic research (Meyer 1975, McArthur 1989) indicates that phrasal verbs are largely found in informal English speaking contexts and environments ("Can you *put out* that cigarette?"), whereas their literary, Latin-based equivalents are used much more frequently in formal, academic writing ("Please *extinguish* all flammable materials immediately."). The problem this study addresses is determining the extent to which spoken phrasal verbs are found in the academic lectures commonly encountered by international students whose training in English is predominantly formal and literary. Such academic lectures include American university courses in Business, such as Management, Marketing and Accounting, and other

popular international student courses, such as Engineering. Given that lectures in American colleges and universities appear to be more informal in style (DeCarrico & Nattinger, 1988), and that phrasal verbs are an integral part of conversational English (Celce-Murcia & Larsen-Freeman 1983, McArthur 1989) this research also seeks to explore the question of whether figurative phrasal verbs are indeed not more frequent than the more literal varieties of phrasal verbs in American academic lectures.

The significant occurrence of phrasal verbs in academic lectures may introduce an informality of idiomatic English into serious academic course work for which many international students are unprepared. Studies indicate that for Chinese students, academic focus in their use of English tends to have greater importance than the focus on conversational English for communication with native speakers (Burnaby & Sun 1989). From the intercultural perspective, for example, comprehension and production of phrasal verbs by non-native English speakers can effectively promote informal day-to-day spoken communication with native English speakers; however, intercultural communication research indicates that for some nationalities, especially Chinese international students in the United States (i.e., Mandarin speakers from China and Taiwan), social and intercultural interaction with Americans is of relatively minor importance in view of a higher objective in acquiring academic degrees (Klein 1974). Intercultural research (Yeh & Chu 1974) further suggests that for the duration of their stay in America, Chinese students largely affiliate primarily with co-nationals of their own subculture to facilitate effective adjustment to American culture, while fulfilling their academic objectives in the United States.

Not only do such findings support the conclusion that informal conversational English is of relatively minor importance for Chinese international students in comparison with academic English, but a recent study involving interviews with Chinese teachers of English in the People's Republic of China emphasizes the contextual constraints which make communicative language teaching difficult to implement there, as well as undesirable in its impact on their status as English teachers in China. (Burnaby & Sun 1989). While such educators accept interactive/student-centered approaches to teaching English in China for their Chinese students who are non-English majors and planning to travel to English speaking countries for study, still by a large margin the foreign language teaching in China is conducted by Chinese teachers, a majority of whom "have never talked to a foreigner and/or been outside of China" (223). The focus of such teachers, by contrast to western interactive student-centered approaches, is to teach their Chinese students analytical skills and knowledge of English grammar in order to read technical articles and translate documents in China. Such teachers welcome further interactive language teaching emphasis in China primarily for their non-English majors in China, but also acknowledge the minimal access to authentic communicative materials for such students.

The importance to this study of the research findings above lies in the point that if phrasal verbs -- especially the ambiguous figurative ones -- do occur significantly in academic lectures attended by larger numbers of sojourning Chinese students, then it is arguable that the formal and analytical approaches emphasized in their English education in their native countries, such as China, have left many of these students with minimal exposure to the conversational style of academic lecture found in universities in the

United States (Dudley-Evans & Johns 1981, as quoted in DeCarrico & Nattinger, 1988). This research does not study the effect of phrasal verbs on Chinese student comprehension of academic lectures; however, descriptive analysis of the linguistic environments discussed above will help our understanding of the frequency with which such non-native English speakers will encounter phrasal verbs in university lectures. Lectures of particular interest will include those which are subject to higher enrollment by students from Chinese speaking countries.

Curricular Concerns

This research, then, is motivated by an interest in determining the degree of relevance of teaching idiomatic characteristics of informal spoken English to Chinese university students who plan to study in the United States. This population of students would include English as a Second Language (ESL) and English as a Foreign Language (EFL) learners whose primary goal for using English is generally instrumental rather than integrative -- the successful fulfillment of academic degrees in American universities. As suggested above, EFL teachers intending to teach English in a Chinese speaking country may find that their EFL student population has very little interest in using English to engage in informal interaction with native speakers of English. This is confirmed by Judd (1981), who distinguishes English as a Second Language from English as an Additional Language (EAL); English as a Language of Wider Communication (ELWC); and English as a Foreign Language (EFL). Each of these categories enables us to see that curricular decisions must be made for each of type of English

teaching according to what is relevant to the needs of each respective group of English learners (Judd 1981: 3-6).

Unresolved issues, then, which serve as a catalyst for this study, include whether or not the aural comprehension of phrasal verbs will have curricular importance in ESL/EFL courses that prepare Chinese students for American academic lecture courses. This question is useful to consider if there is a significant occurrence of phrasal verbs in those lectures. The occurrence of phrasal verbs in academic lectures is relevant to ESL learners who are largely excluded (or self excluding) from informal spoken English contexts with native or fluent English speakers, ESL students who maintain instrumental goals to use English for Specific Purposes (ESP). An attempt to describe the register range of spoken English in academic courses in which Chinese ESL students commonly enroll (fulfilling their academic majors by means of EST or ESP) by recording and describing the use of phrasal verbs in those linguistic environments, should prove useful for curriculum planners and teachers in determining the extent to which such idiomatic linguistic phenomena should be included in ESL/EFL curricula. Though beyond the scope of this study, such assessments could likewise be accomplished under the other English language instruction classifications mentioned above.

STATEMENT OF RESEARCH QUESTIONS

The focus of the research of this study is in gaining quantifiable measurement to answer two general research questions about phrasal verbs in academic lectures. This study focuses on the existence and frequency of phrasal verbs in lecture classes, and with particular focus on figurative

phrasal verbs. This latter focus is of interest because figurative phrasal verbs are the most semantically difficult phrasal verb to teach, as well as considered the most prevalent (Nattinger & DeCarrico, in press) in addition to a third more specific research question about phrasal verbs in specific lectures:

1. *In university classrooms, are the phrasal verbs spoken by native English speaking lecturers?*
2. *Are figurative phrasal verbs in academic lectures significantly greater in frequency than non-figuratively classified phrasal verbs in the academic lectures?*
3. *Do certain academic subjects tend to generate a significant increase in the number of phrasal verbs spoken by instructors, of either the more idiomatic figurative phrasal verbs, or the more readily understandable literal or completive phrasal verbs?*

SOME KEY DEFINITIONS

Some preliminary discussion is necessary to clarify the categories of phrasal verb information being distinguished for analysis from the lecture transcripts. First of all, it is important to emphasize that research questions #1 and #2 involve two levels of linguistic analysis of the transcript data. While phrasal verbs are defined as being two- or three-part verbs functioning as a single word verb in meaning, they syntactically are composed of a verb plus adverbial particle, with the two components combining to determine the classification of phrasal verb by the literalness of the meaning of the particle in conjunction with the verb. Identifying them within a corpus of linguistic text requires knowing that phrasal verbs are syntactically similar to non-

idiomatic verb plus preposition constructions, such as verbs plus prepositional phrases, and also syntactically similar to prepositional verbs.

"John ran up a hill."	verb+prep phrase
"John ran up a bill."	figurative phrasal verb
"John depended on Bill."	prepositional verb

By definition, however, it is crucial to know that phrasal verbs are *semantically* distinct from these other constructions, phrasal verbs having a semantically unified idiomatic meaning, and the other constructions having a semantically segmented set of unchanged literal meanings of the verbs and the prepositions. Further discussion of these distinctions will be considered in the subsequent chapter.

Once the first level of analysis is accomplished, the second level of analysis (Research Question #2) requires proper understanding of the semantic definitions of the specific categories of phrasal verbs being analyzed, because this research is concerned with determining the frequency of those specific categories that present the greatest comprehension difficulties for International students in academic lectures. Literal, completive and figurative phrasal verbs, are the three semantic categories proposed by Fraser (1976) as encompassing the whole set of phrasal verbs, and are determined by the meanings of the verb plus particle combinations (Fraser 1976, as quoted in Celce-Murcia 1983). Figurative phrasal verbs are characterized by figurative, or non literal meanings, such that the combined meaning of verb and particle is not the predicted meaning based on the literal meanings of the verb and particle components. An example of the unpredictability of meaning for figurative phrasal verbs is the combination of various particles with the same

verb, resulting in divergent unpredictable meanings, such as “turn down” (refuse), “turn up” (appear), “turn off” (disenchant or alienate), and “turn on” (excite). This does not even include the phrasal verb homonyms which are largely figurative, and yet unpredictable in meaning apart from context. With “turn” for example, “turn on” can take such divergent contexts as “The dog turned on its master” (attacked); “Edward turned on the radio” (started); and “This music really turns me on” (excites me) (Nattinger & DeCarrico, in press).

Figurative language is held to have once been attached to more literal meanings based on formerly existing contexts of the past which have since disappeared. Nattinger and DeCarrico’s example of “putting up a guest” which once involved placing them in an upper bedroom may be just such an example for late 20th century ground floor dwellers (in press). While these metaphorical meanings are lost to most users of such figurative phrasal verbs, Lakoff & Johnson’s idea of “orientational metaphors” (1980) in which the particle “up” means “more” and the particle “down” means “less” describes a limited set of figurative phrasal verbs which are inferable in meaning, for example, “turn up/turn down the volume” means “increase/decrease the volume”.

Extending this metaphor beyond a limited number of sets of figurative phrasal verbs is not possible however, for example, completive phrasal verbs. For this set of phrasal verbs, addition of the particle “up” or “down” does not mean “more” or “less”, but rather completion of an action. “Washing up” rather than merely “washing” implies completing personal washing in an intransitive construction, and “washing down” signifies a complete washing in a transitive construction, e.g., “washing down the car”. Likewise, the

“burning up” or “burning down” of something can only decrease the item burned completely in either construction (Nattinger & DeCarrico, in press). Thus there is a limit to the metaphorical sets of figurative phrasal verbs, but also a limited number of completive phrasal verbs where the verb plus particles as “up”, “down”, or “off” or “out” can signify performing the verb with completion. “Tear up” vs. “tear”, “worn out” vs. “worn”, “cut off” vs. “cut” are further examples of completive phrasal verbs contrasted to an incompletive one word counterpart.

Literal phrasal verbs are those in which the literal meaning of the particle is maintained, as is often true with the accompanying verb, such as “take down” the posters, “hand out” the information, “hang up” the paintings. Occasional overlapping between literal phrasal verbs and completive phrasal verbs will occur, with such expressions as “burn down” having a literal meaning in the particle, but also a completive sense of definition.

CHAPTER II

REVIEW OF RELATED LITERATURE

As a foundation for this study, the following review of the literature focuses on the characteristics of phrasal verbs as a prevalent part of spoken English, and then, focusing on the nature of listening comprehension as the process by which spoken language, including phrasal verbs, is assimilated. Such a literary overview will provide a closer look at the characteristics of phrasal verbs as a prevalent element of spoken English encountered by the ESL/EFL student, an element of English which is understandably difficult when considered in light of current understanding of the nature of listening comprehension processes. Discussion of the literature in these two areas is important in order to more clearly grasp the internal processes the non-native speaker of English undergoes in listening to lectures, and the obstacles he faces in trying to infer the meanings of phrasal verbs and other constructions.

HISTORICAL BACKGROUND

The phrasal verb, also referred to as the two-word verb, is considered to be "the most active and creative pattern of word formation in the American language" (Meyer 1975). Set apart from the one-word literary verb, which is more formal and more suitable for written English, the phrasal verb is much

more informal, occurring primarily in spoken English as an idiomatic type of verb. Since phrasal verbs are considered more of a "folk" vocabulary (Meyer: 8), especially in America, the uninformed teacher of English as a second language may be tempted to view phrasal verbs as not "proper" or standard English, and not something to be included in the ESL curriculum. If the ESL instructor teaches outside the United States, especially in former British colonies where English is not the native tongue, he or she may be tempted to view phrasal verbs as primarily an American phenomenon, as "adulteration" or "pure" English, undeserving of consideration in English textbooks. The ESL instructor may not even be aware that phrasal verbs exist as a unique semantic unit, and hence the instructor may attempt to subject this verb to grammar rules which, say, govern the use of prepositions, as did Winston Churchill, who was said to have commented in jest, *"This is nonsense up with which I will not put"* (Celce-Murcia & Larsen-Freeman 1983).

A closer examination of the origin and development of phrasal verbs in English gives historical weight to the idea that phrasal verbs are not a distinctly American nor contemporary phenomenon. Meyer, for example, traces the English phrasal verb back to the intransitive and transitive verbs of the 9th century. He states that old Anglo-Saxon intransitive verbs of motion came into existence, and these verbs could take certain prefixes to indicate the direction of movement in space which the subject of the verb might take. Such verbs as GO, COME, RIDE, WALK and FLY, were commonly combined with prefixes such as the elements IN, OFF, ON, OUT, THROUGH, and UP. Likewise, old Anglo-Saxon transitive verbs conveying movement in space also came into existence, verbs which could combine with these prefixes. This addition of prefixes to intransitive verbs originally indicated the position

in space of the object of the verb, which the action of the verb sought to bring about (Meyer 1975:5-6). Then by the 11th century, these prefixes began to be positioned after the verb in loose suffixation. Examples of the latter would be the shift from "He has outgone," more typical in the 9th century, to "He has gone out," a more typical expression in the 11th century. Another example of such a shift would be "He has updug the roots," more typical in earlier days, and the 11th century "He has dug up the roots" (Meyer 1975:5).

The long-standing existence of English two-word verbs is affirmed by Meyer when he cites the dating of the appearance of the second elements of those verbs from the 9th to the 16th century.

9th century.....	in, on, out, up
10th century.....	away, by, off
11th century.....	over, through
12th century.....	down, under, about
13th century.....	along, aside
15th century.....	back
16th century.....	across

Figure 1. The English phrasal verb particle over seven centuries.
Source: Meyer 1975,5.

Apparently, with English, by the 11th century, the elements stated above were no longer attached as prefixes to the verb; meanwhile Sanskrit, Greek, Latin, Russian and other major Indo-European languages held onto the pattern of prefixation in order to give variation of meaning to verbal root words. English however, took a different turn and developed "a flexible and very

productive pattern of loose fixation " (Meyer: 6). The older English pattern of prefixation currently is found only in a few isolated or archaic words. Therefore, fossils such as ARISE, AWAKEN, BEDECK, BEDEW, FORFEND and FORGET are largely replaced by two-word verbs as RISE UP, WAKE UP, DECK OUT, MOISTEN OVER or UP, BLACK OUT (6). Other old stressed Germanic prefixes are included as no longer productive, such as "aet-", "fore-", "forth-", "full-", "of-" and "to-".

<i>aetberan</i>	becomes	<i>bear</i>	or	<i>take away</i>
<i>bistanden</i>	becomes	<i>stand around</i>	or	<i>stand by</i>
<i>forestanden</i>	becomes	<i>stand out</i>		
<i>forthcumen</i>	becomes	<i>come out</i>		
<i>fullgrowan</i>	becomes	<i>grow up</i>		
<i>ofgiefan</i>	becomes	<i>give up</i>		
<i>to-beaten</i>	becomes	<i>beat up, beat down, beat out</i>		
<i>to-blawen</i>	becomes	<i>blow off, blow down, blow out</i>		
<i>to-breca</i>	becomes	<i>break up, break down, break through</i>		

Figure 2. Older Germanic particle prefixation of English verbs.
Source: Meyer 1975,6.

The development of the various particles, used today in loose affixation after the verb (such as "up") is also traceable, as from the 9th to the 20th centuries, they acquired new meanings .

Some foreign teachers of English may raise objections as to the appropriateness of teaching a vernacular, non-literary English as phrasal verbs within their own academic contexts, with the feeling that they are

distinctly "contemporary American adulterations"; however, a further glimpse at the historical roots of the English language as a whole indicates that phrasal verbs are neither contemporary nor American in origin. For example, both Meyer (1975) and McArthur (1989) point out that much of the English language of today is of Germanic origin, about 40% (Meyer 1975:6). The fact that very few non-Germanic languages have phrasal verbs, as Celce-Murcia & Larsen-Freeman observe (1983: 265), supports their point that for most ESL/EFL students, such verbs will be strange and difficult to comprehend and use. McArthur points to their long neglect as a vernacular and Germanic portion of English, stating that

[b]ecause they have for centuries been part of that 'plain' foundation underneath the French and Latin superstructures of the language, they have attracted little attention among classically inspired grammarians ... as a result, this linguistic orphan has waited until the later 20th for adequate coverage in grammar book and dictionary (1975:39).

Not only is the historical continuity of phrasal verbs identifiable through centuries of development in the English language, but phrasal verbs are alive and productive in the English language today -- in America and beyond. While not prevalent in written, scholarly works, it pervades culture where English is actively spoken. Meyer states,

While new terminology in the sciences continue to be developed by using Greek and Latin elements to describe events, processes, and relationships, the folk mentality takes more readily to the creation of the new vocabulary through the use of Anglo-Saxon and Early English elements to meet the need for new vocabulary in new fields of knowledge and activity.

The two word verb pattern is at hand to furnish verb, noun and adjective elements needed for communication in our present day, rapidly evolving society" (1975:3).

GRAMMATICAL ANALYSIS -- DISTINCTION OF PHRASAL VERBS FROM VERB PLUS PREPOSITION SEQUENCES

For many English speakers and educators, it may be a revealing discovery to learn that phrasal verbs are not only a long time component of the English language, but that studying them as part of English grammar can increase awareness of idiomatic trouble spots in spoken English, for non-Germanic ESL/EFL students and for native speakers of English communicating with such students. Like non-idiomatic verbs in English, phrasal verbs may be intransitive, as stated by McArthur ("[S]he *got up* and *went out*") (1989:39), and Celce-Murcia & Larsen-Freeman ("My car *broke down*," "Why don't you *come in*?") (1983:266). Phrasal verbs may also be transitive, and as such fall into categories of separable and inseparable phrasal verbs, experiencing various degrees of obligation in either category.

I came across an interesting article.	I came across it (last night).
*I came an interesting article across.	*I came it across (last night).
John ran into an old friend.	John ran into him.
John ran an old friend into.	*John ran him into.

Figure 3. Separability and Inseparability of Transitive Phrasal Verbs
Source: Celce-Murcia & Larsen-Freeman, 1983:268.

The above table illustrates separable phrasal verbs as separated obligatorily only when object pronouns are present, and inseparable phrasal verbs as inseparable in the environment of object nouns and pronouns.

The grammatical study of phrasal verbs goes beyond issues of transitivity and separability into a more challenging and ambiguous

distinction -- that of phrasal verbs from verb plus preposition sequences, with the former consisting of verb plus adverbial particle. Many sources devote a generous amount of space to this issue (Celce-Murcia & Larsen-Freeman 1983, Palmer 1968, Nattinger & DeCarrico in press, Quirk & Greenbaum 1973, and McArthur 1989). Palmer identifies four categories which would require analysis for making idiomatic and nonidiomatic distinctions, all but the third of which allows for the possibility of phrasal verb formation.

1. verb + adverb without noun phrase

The enemy gave in. (idiomatic; intransitive phrasal verb [PV])

The guests came in. (nonidiomatic)

2. verb + adverb with noun phrase

She made up the whole story. (idiomatic; transitive PV)

She brought up a book. (nonidiomatic)
(to a child in bed)

3. verb + preposition with noun phrase

I didn't take to him. (idiomatic; transitive prepositional verb)

I didn't go to London. (nonidiomatic)

4. verb + adverb + preposition

I can't put up with that woman. (idiomatic; phrasal
prepositional verb)

She walked up with her brother to visit us. (nonidiomatic)

Figure 4. Phrasal and prepositional verb constructions.
Source: Palmer 1968: 183.

One observation worth noting from Figure 4 is that all the nonidiomatic constructions serve the adverbial function of direction, a function which is not fulfilled by the phrasal verb construction. As a matter of fact, one of the distinguishing features of phrasal verbs from verbs plus prepositions is the function of the preposition as an adverbial modifier of direction, place, time, manner and instrument, functions which are not performed by phrasal verb particles. It should also be noted from Figure 4 that Palmer's phrasal prepositional verb, though supported by Quirk et. al. (1985), is also considered by others to function as a three-word or phrasal verb, for semantic reasons (Nattinger & DeCarrico, in press).

In their linguistic description of phrasal verbs, Nattinger & DeCarrico point out the fundamental distinction that phrasal verbs are *polyword lexical phrases*, with fixed unified meanings and non-interchangeable components. According to the definition in DeCarrico & Nattinger (1988), lexical phrases are prefabricated chunks of language that have a fairly conventionalized, idiomatic and fixed meaning, at the disposal of the speaker without being individually constructed each time of speaking, including phrases like *as I was saying, on the other hand, as X would have us believe*. Phrasal verbs as polyword lexical phrases are prefabricated word phrases that can't be broken apart without losing the meaning they form together. All other verb plus preposition sequences on the other hand, are *phrasal constraint lexical phrases* -- "somewhat fixed phrases with slots that permit variation" (Nattinger & DeCarrico in press). Examples of a phrasal constraint lexical phrase would be

'a _____ ago' or 'down with _____' or
 'good luck with your _____'

Nevertheless, McArthur (1989:42) points out that from the point of view of neat grammatical description, there is an uneasy continuum between the phrasal verb proper ... and verbs that are followed by what look like (and usually are) straightforward prepositional phrases. McArthur, if comparing two sentences such as "He ran up a hill," and "He ran up a bill," would emphasize that proper sentence analysis would render these sentences differently: (He ran) (up a hill) and (He ran up) (a bill). His explanation for the latter analysis would be that "the preposition has, as it were, been 'stolen' from its own phrase and 'fused' with the verb in a unique idiomatic relationship" (1989:42).

To distinguish phrasal verbs from verb plus preposition sequences (and other nonidiomatic sequences), various tests are proposed involving manipulation of the grammatical structures of the sentences. Celce-Murcia & Larsen-Freeman (1983) propose the movement of the particle or preposition being considered to the front of a wh-question, such that if an acceptable combination is formed, the original form would then be nonidiomatic rather than a phrasal verb:

Sarah looked at the picture. -----> At what did Sarah look?

Phillip made up the incident -----> *Up what did Phillip make?
 (1983:269)

The ungrammatical transformation indicates that the original sentence verb was a phrasal verb, while the grammatical transformation contained a nonidiomatic combination.

A second test for distinguishing phrasal verbs from nonidiomatic combinations cited by Celce-Murcia and Larsen-Freeman would be checking if the proposition or particle can be fronted in a relative clause, with the ungrammatical result indicating the presence of a phrasal verb:

The picture at which Sarah looked reminded her of home.

*The incident up which Phillip made was not true. (1983:269)

A third test they point out, though somewhat controversial in terms of reliability, is inserting an adverb between the verb and the particle, producing an ungrammatical sentence where a separable phrasal verb is present:

Sara looked quickly at the picture.

*Phillip made quickly up the incident. (1983:269)

The problem with this test lies not so much with its implementation with separable phrasal verbs such as those above ("Make up the story." vs. "Make it up."), as in the example above, but in its implementation with inseparable phrasal verbs, which can be argued as acceptable sentences by some English speakers:

?John ran unexpectedly into an old friend.

?I came suddenly across an interesting article. (1983:269)

SEMANTIC CLASSIFICATIONS FOR PHRASAL VERBS

One of the strongest characteristics for defining and understanding phrasal verbs is their semantic properties as a fixed, idiomatic idea. According to Palmer (1968:180), there are important reasons for us to treat phrasal verbs as single units of grammar. One reason is that the phrasal verb has severe collocational restrictions; i.e., it is a fixed phrase that carries a unique meaning. For example we can put up with someone but we can't put *down* with them. We can work up an appetite but we can't work *down* an appetite. We can look after someone but we can't look *before* them. The point of these examples is that phrasal verbs are not defined according to the meanings of their individual components. Because they are idioms, they are definite indivisible semantic units. PUT UP WITH equals TOLERATE. WORK UP equals DEVELOP. LOOK AFTER may be replaced by TEND. A final reason for treating phrasal verbs as single units in grammar, according to Palmer, is that except for the intransitive verbs (such as GIVE IN), phrasal verbs have corresponding passives. We can say "She can't be PUT UP WITH." "An appetite was WORKED UP." "They WERE LOOKED AFTER" (Palmer 1968:180).

Though an increasing number of current ESL grammar texts are now including sections or chapters on phrasal verbs, including lists and explanations of separable vs. inseparable phrasal verbs, these glossary list approaches often do very little simplifying of the subject matter, and neglect any consideration of general semantic classifications for phrasal verbs. Celce-Murcia & Larsen-Freeman, as well as Nattinger & DeCarrico (in press) refer to useful simplifying semantic classifications (Fraser 1976, as quoted in Celce-

Murcia & Larsen-Freeman, 1983). As previously discussed, figurative phrasal verbs -- the idiomatic group presenting deductive difficulties in ESL -- are distinguished from completive and literal phrasal verbs. These distinctions are useful in following the lexical phrase approach to phrasal verbs, and in their discussion of these three semantic categories, Nattinger & DeCarrico have determined that even though verbs like "put," "look," "pull," and "get" may all be combined with the same particle and all yield semantically unrelated variants, yet many figurative verbs may be predictively categorized by "metaphorical sets", where "up" means "more" and "down" means "less" (See also Lakoff & Johnson, 1980). As noted previously however, this is a very limited set, and sometimes these particles in combination will produce the opposite meaning. Completive phrasal verbs do not follow metaphorical sets, they claim, but their meanings are more readily deducible in terms of the idea of completion aside from the literal meanings of the particles. Lastly, literal phrasal verbs retain a literal or related meaning.

The semantic unity feature of phrasal verbs is considered by some the strongest basis for distinguishing phrasal verbs from other verb plus preposition sequences, as opposed to various syntactic tests discussed earlier, largely due to the complexity of grammaticality judgments required by ESL students in implementing the syntactic tests -- even advanced ESL students (Nattinger & DeCarrico in press). On the other hand, the contextualization of phrasal verbs as polywords within the lexical phrase system is quite useful, establishing a clearer contrastive basis by which to better understand phrasal verbs. As polywords, they are contrasted with phrasal constraints, the former being lexical phrases holding no constant meaning "slots" in the verb or particle position. Because all other preposition plus verb sequences maintain

a constant meaning slot, they are classified as phrasal constraints, maintaining open slots for interchanging appropriate words and resulting in predictable meanings (e.g., "John worked up the hill;" "John worked over the hill;" John worked _____ the hill."). As polywords on the other hand, phrasal verbs are semantically unified into one inseparable meaning, having single word synonyms derived from Latin or French (and hence, "John worked up an appetite;" *John worked over/on/around/down an appetite".) The phrasal verbs then, being fixed lexical phrases are therefore distinguishable for students as a separate, singular lexical item.

The functional distinctions of polywords from phrasal constraints in the lexical phrase system are an important basis for distinguishing phrasal verbs from other verb constructions, and the shapes of the structure are also an important factor. In the first case it is emphasized that phrasal verbs contrast with prepositional phrases because the phrasal verbs function simply as verbs ("John worked up [= generated] an appetite"), while prepositional phrases function as adverbials of time, location, instrument or manner (John worked at 7:00 A.M./at Joe's Garage/with his hands). The shapes of these polywords and phrasal constraints naturally vary by definition -- the former having no open slots to allow an interchange of words to fit the constant meaning of the frame ("worked up" does not equal "worked down", etc). Likewise, prepositional verbs are phrasal constraint lexical phrases, with a slot in the preposition position which allows for substitution of prepositions without greatly changing the meaning of the verb (e.g., "agree on," "agree about," "agree with"). In contrast, the phrasal verb has no such P-slot. It is an important distinction by Nattinger & DeCarrico that while prepositional verbs with non-variable prepositions (e.g. "rely on," "look at") may be taught

as single word verbs, they are still distinct from phrasal verbs in that the former are single word verbs *syntactically*, not semantically. Since the focus of this study is phrasal verbs comparison will not be made of the varieties of frame shapes of different prepositional verbs, but only an acknowledgement at this point that the reality of the existence of slots and frames distinguishes them from phrasal verbs. However, these distinctions are thoroughly delineated by the lexical phrase approach.

Other important distinctions between phrasal verbs and verb + preposition sequences that could be important to include in an ESL text and a trouble spot to students, according to Nattinger & DeCarrico, include the distinction between phrasal verbs and verbs + prepositional phrases, especially when the former are separable and transitive. With the contrasting examples given of

Mary looked over the fence.

Mary looked over the article.

The students can be urged to identify any possible phrasal verbs by testing whether either "looked over" can be replaced by a single word of equivalent meaning, and then when the direct object is replaced by a pronoun "it" they can be reminded that for phrasal verbs the object pronoun falls between the verb and the particle. The non-semantically unified verb phrase will have a prepositional phrase which is adverbial and will require the retaining of the object pronoun immediately after the preposition. According to Nattinger & DeCarrico the students will benefit greatly if they learn to recognize the functions of the prepositions -- whether they are functioning as

particles in a phrasal verb, or as adverbials of time or place or as prepositions in a prepositional verb construction. Texts or teachers pointing out these distinctions can greatly help students avoid pronoun displacements in addition to avoiding semantic misinterpretations.

Admittedly, the non-native speaker of English may be hard pressed to come up with single word synonyms for many phrasal verbs, especially when the synonyms are formal and infrequent in use, such as many Latin verbs. Learning to convert transitive verb constructions within sentences that use either phrasal verbs or verbs + preposition into WH-questions is an excellent supplementary approach suggested by Nattinger & DeCarrico (in press) With this technique, the object following the verb can be questioned, and if the WH-question is "Where," "When," or "How," this indicates that the verb is being followed by a preposition, because prepositions serve an adverbial function to the verb in defining the place, time or manner of the action. WH-questions formed when the verb is a transitive phrasal verb will produce a "Who" or "What" question, meaning that the verb is being followed by a particle which unites with the verb to act upon the object of the verb. This particle does not modify the verb in terms of place, time or manner, indicating that it is not a preposition, but a phrasal verb particle. Questioning the above sentences demonstrates the WH- question test:

Mary looked over the fence.=====>Where did Mary look?

Mary looked over the article.=====>What did Mary look over?

While the argument may be raised that the question for the first question can be structured identically to the second question, the fact that it can take a "Where" question indicates the presence of preposition. It is true that the fact that the first example can take a "What" question indicates the verb is prepositional verb, which creates an exception to the WH-question rule. Prepositional verbs, however, do not readily display the semantic unity of phrasal verbs, in terms of one word synonyms, such as prepositional verbs like "depend on", "collide with" or "deal with". The semantic unity test can work hand in hand with the WH- question test in transitive verb constructions. Intransitive constructions will be more difficult for non-native speakers because the WH-question is inapplicable to that context; nevertheless, the combination of the two approaches can distinguish when a verb construction is likely to be a phrasal verb, and thus likely to have a more figurative meaning. The present research seeks to describe, in academic lectures, how frequently those phrasal verbs are likely to be figurative.

Semantic unity is emphasized as the chief criterion to determine the existence of a phrasal verb polyword, such that the removal of either the verb or the particle would result in a significant change of meaning. Substitution of a different verb or particle resulting in a significant change of meaning would also indicate a phrasal verb. Since the semantic unity test would apply for the figurative and completive phrasal verbs, being all polywords, it is an important test for distinction, since these two groups of phrasal verbs make up the largest number of them. The argument that completive verbs form a frame when conjoined as a limited set to the word "up" is a very limited argument, with still a great many semantically unified combinations to deal with.

CURRENT LITERATURE ON LISTENING COMPREHENSION THEORY

Since the concern of this study is the description of the frequency of the occurrence of major classifications of phrasal verbs spoken by native English speakers in academic listening environments encountered by ESL/EFL students, we must take a closer look not only at what defines phrasal verbs, but what the meaning of listening comprehension is for those ESL students trying to understand native-spoken phrasal verbs. Current understanding of the nature of listening comprehension relies on interdisciplinary research in psycholinguistics, semantics, pragmatics, discourse analysis, and cognitive science, according to Richards (1983). Research in the field is largely focused on native language comprehension, however, and it is drawn upon where relevant to second language comprehension. This study will examine some generally accepted components of listening comprehension theory, and also the effects of three specific variables on ESL listening comprehension.

One summary of research on native language listening comprehension identifies three related levels of discourse processing in listening: propositional identification, interpretation of illocutionary force, and activation of real world knowledge (Richards 1983) -- what has been said and how it was said, as measured against our internally stored information about reality. Richards focuses on the issue of central concern for listening theory and teaching, that it is the question of the nature of the units listeners use to understand language: *"Do we listen for intonation, stress, words, grammar, sentences, or some other type of linguistic unit?"* (223, italics added) Propositions are summarized as the basic unit of meaning in regard to comprehension (Clark and Clark 1977, as cited in Richards 1983), identified in

discourse by listeners based on their knowledge of the syntax of the target language, in conjunction with their knowledge of the real world. It is suggested that the listener applies the knowledge of syntax to break down discourse into chunks or segments, in the process of identifying propositions. Sentence 1 of the example below illustrates this point, unlike Sentence 2:

- I am informed that your appointment has been terminated.
1. I am informed/that your appointment/has been terminated.
 2. I am/informed that your/appointment has/ been terminated.

Figure 5. Syntax guided vs. random discourse chunking.
Source: Richards 1983

Identifying propositions incorporates real world knowledge as well, as input is juxtaposed against the knowledge of plausible events, as reflected by the unscrambling of (1) below into the sequence of (2):

1. and rat cat it chased the ate the
2. The cat chased the rat and ate it.

A semantically based view of how a listener decides the meaning of a sentence states that long term memory does not retain the formal structures used in communicating a message, but the meaning of the sentence is what remains in the long term memory. The theory, widely accepted in cognitive psychology, is that raw data go from short term to long term memory as data are "chunked" into constituents, which are built together to form propositions into a meaningful message. The meaning of the propositions is personally paraphrased and retained in long term memory, and the linguistic

form which packaged the original message is deleted from the memory. In this process, Call (1985) affirms the importance of short term memory for auditory input, and also affirms that memory for syntax is a bigger determiner of listening scores than memory for random words, since syntax enables the learner to more effectively structure information into more simplified chunks, making input more comprehensible (1985: 777).

Beyond this view of listening, a pragmatics based view goes beyond the proposition level of fact to consider the illocutionary force of specific utterances in specific social contexts. This goes beyond the factual meanings of propositions and looks for the intention of the speaker, such as in speech act theory. One example of this is the sentence "Helen likes chocolates," which is a propositional statement about Helen, which

does not tell us whether the sentence was uttered in order to offer an *explanation* of her obesity, a *suggestion* as to what to do with the chocolates or a *denial* of a previous assertion (Richards 1983: 221).

Language then is not merely processed in abstraction, but with contextualized intention and goals, cooperatively organizing meaningful discourse by a mutual "cooperative principle" (Grice 1975:45), that appropriately determines the quantity, quality, relevance and manner of our contributions in conversation, which the listener normally anticipates with appropriate reciprocity. A conversation hence seems to suggest that prior knowledge existed between the two conversationalists which allowed them to inference and interpret the meanings of each other's statements in an active and creative listening process.

The idea that listening is an active rather than a passive process coincides well with various recent articles discussing specific variables

impacting listening comprehension ability by ESL students, variables such as the use of lecture transcripts in EAP lecture comprehension courses (Lebauer 1984); teacher-facilitated referential questions influencing ESL classroom discourse (Brock 1986), and the impact of student interaction on listening comprehension in the ESL classroom (Pica, Young and Doughty 1987). In regard to lecture comprehension courses for EAP students, Lebauer begins with discussion of the cognitive factors within the listeners which influence their ability to recreate the lecture text based on their previously acquired knowledge, or schema. She affirms the listeners' need to be able to predict lecture text meaning at the phonetic, syntactic, lexical and discourse levels, and she implements strategies to enable them to more effectively predict meaning at most of these levels, using lecture transcripts to help the students identify inferential cues for interpreting lecture discourse. Studying such transcripts enables students to identify rhetorical devices and their specific function in the discourse, so they can more effectively predict meaning.

The influence of teacher-initiated referential questions on ESL classroom discourse (Brock 1986), like the impact of student interaction on student listening comprehension (Pica, Young and Doughty 1987), seem to correspond well with the aforementioned model of listening comprehension in which listening is an active process of predicting meaning based on the listener's previously acquired knowledge. The first study showed that students generally produced higher cognitive level responses to higher cognitive level questions -- referential questions in which the teacher did not already have the answer, as opposed to display questions in which the teacher knew the answer but wanted to get the students to display their knowledge with the right answer. These results lend support to the idea that teacher

initiated referential questions more effectively activate the students' schema, thus resulting in a more sophisticated student response. The second study showed better listening comprehension results for non-native speakers of English through interactionally modified input over premodified input, as the former type of input allowed them to make comprehension and confirmation checks, as well as clarification requests, which enabled the non-native speakers to more actively engage in the listening process than the group receiving premodified (presimplified) input (737).

PHRASAL VERBS AND ESL LISTENING COMPREHENSION

The review of the literature on phrasal verbs and ESL listening comprehension appears to highlight some major points between the two which do not work hand in hand, in that phrasal verbs are fixed polywords with meanings that cannot readily be inferred by studying a general syntactic structure with open frame slots. These slots organize meaning into general structures, and play an apparent major role in "chunking" information for greater simplicity and comprehensibility in terms of ESL listening, such as in lecture courses. If there is no syntactic structure for the student to memorize for the many (and multiplying) phrasal verbs in existence in spoken English today, how can the ESL student effectively acquire them? As polywords -- fixed phrases with unified meanings, must they simply be memorized as individual, figurative and noninferable vocabulary items? Nattinger and DeCarrico (in press) shift our attention away from syntax in regard to phrasal verbs, and focus it on semantic classifications -- literal, completive and figurative phrasal verbs. These classifications appear useful in facilitating the

teaching of phrasal verbs, but how such semantic categories can help improve student ability to infer their meaning in listening comprehension remains to be seen. For our purposes in this study, these classifications will serve as a framework by which we will seek to describe the frequency of these phrasal verbs in academic listening environments controlled by native or fluent English speakers, in which the ESL student will function as a listener and a participant.

CHAPTER III

RESEARCH METHOD AND PROCEDURES

RESEARCH DESIGN

This study is a descriptive and statistical analysis of the spoken English language used by American university lecturers. It is descriptive rather than experimental, in describing and quantitatively measuring linguistic information external to the international students attending such lectures. It deals with external input to the the international student listener rather than internal lecture comprehension processes. Furthermore it compares frequencies of idiomatic, or figurative linguistic features in a cross section of academic lectures in which the international student, with rare exception, assumes the passive role of merely listening to the lecture, not questioning or interacting with the instructor during the lecture delivery process.

The recognition and distinction of phrasal verbs from other verb plus preposition sequences was performed by two raters primarily by implementing the semantic unity test described below (Nattinger & DeCarrico, in press), for all such verb sequences found in the written transcripts. Additionally, the WH question test (Nattinger & DeCarrico, in press), also described below (See Appendix A), was implemented as a useful secondary strategy in distinguishing transitive phrasal verbs from adverbial phrases of place, time and manner, while not useful in distinguishing phrasal

verbs from prepositional verbs. The semantic unity test was again implemented for making distinction between transitive phrasal verbs and prepositional verbs. The raters included the researcher and a second rater with nine months of experience as a research assistant in psychology at University of Oregon, coding verbal and nonverbal information of videotaped counseling clients, in the department of psychology. The second rater, furthermore, is of Singapore nationality, and bilingual in English and Chinese, speaking both languages fluently since 1975.

The three categories specified for analysis in this study have been defined semantically rather than grammatically, as a useful and effective framework for understanding and distinguishing phrasal verbs. Those categories are phrasal verbs in general, figurative phrasal verbs, and then completive and literal phrasal verbs. Since the distinguishing of figurative phrasal verbs was more central to the focus of the research, the completive and literal phrasal verbs were not individually distinguished in the analysis, but were combined under the category of "non-figuratively classified phrasal verbs", abbreviated as "non-FPV's". This category name is not to imply that literal and completive phrasal verbs do not contain elements of figurativity in their semantic characteristics, but that their characteristics of literalness or completiveness, especially in the meaning of the particle, are more dominant in warranting the classification of them as literal and completive phrasal verbs, thus making them non-figuratively classified phrasal verbs. The creation of this category is thus meant to imply that for the purposes of this study, the differentiation of literal and completive phrasal verbs is not important. Frequency distribution was determined then with this design, based on the findings that the figurative and semantically noninferable

characteristics of the verb and particle combination of figurative phrasal verbs constitute more serious learning difficulties for ESL students than with literal and completive phrasal verbs (Nattinger & DeCarrico, in press). Therefore, phrasal verbs were analyzed along these semantic categories to determine whether the number of phrasal verbs falling into the figurative category was significant.

Distinguishing the above three categories of phrasal verbs involved closer inspection of the function of the particles in combination with the respective verbs. Literal phrasal verbs were most easily distinguishable because the literal meaning of both the verb and the particle was retained, such as "to hang up" (the picture), "to take out" (the garbage), and "to take down" (the decorations). The verb plus particle combination in the completive phrasal verb constructions indicated a completed action, with "up" serving as the most common example of completion, such as "to clean up", "to finish up", etc. Particles such as "out", "off" and "down" also often indicated completion, such as "to wear out", "to cut off" and "to burn down" (Nattinger & DeCarrico, in press). The predictability of the particles in combination with the verb to shape the meaning of these phrasal verbs was thus useful in categorically classifying them as non-FPV's. Finally, the meaning of the particle in conjunction with the verb for FPV's was largely unpredictable, producing a combined meaning quite unrelated to the parts. The exception to this would be those cases which fall into metaphorical sets in relation to the particle, where, metaphorically, "'more' is up and 'less' is down" (Lakoff & Johnson, 1980). Examples of this would be to "turn up" vs. "turn down" the air conditioner, meaning to increase vs. decrease the amount of air conditioning.

THE LECTURE DATA

In order to obtain a sizeable corpus of printed lectures for analysis of phrasal verbs, primary and secondary sources of lecture transcripts were gathered which would provide a minimum of three, 1000 word lecture segments per lecture. The primary source was seven transcripts produced by the researcher with an assistant transcriber, representing four upper division business courses, and one lower division mechanical engineering course, all held at Portland State University. Two of the four business courses were attended, taped and transcribed for two separate sessions each as a comparative basis for measuring for statistically significant variation of phrasal verb use by the same lecturer during different lectures in the same course. The secondary lecture data source was three undated lecture transcripts produced by Roni Lebauer at University of California at Irvine, and sent to Applied Linguistics faculty at Portland State University in June of 1987, representing introductory biology and social science courses.

With respect to the primary source of collected data, the six upper division business class sessions, in addition to one lower division mechanical engineering class session, were tape recorded during June -- August 1990 of Summer Session at Portland State University. Engineering, business and management courses were chosen because they have consistently attracted the highest international student enrollment in the United States for more than a decade (Huckin & Olsen 1984). Additionally, courses selected for taping were 8 weeks long, as opposed to summer mini-courses of much shorter length. The rationale in choosing regular lecturers and the longer

courses was to tape lectures representative in length and quality of those offered throughout the academic year by the given instructors.

Several factors are worth mentioning, though difficult to isolate, as possible influences to the frequency of phrasal verbs in general, as well as and figurative phrasal verbs in specific, used by the lecturers in the classes which were observed, taped and transcribed. These factors include the composition of the class, in terms of native speakers and non-native speakers of English; linguistic and personality characteristics of the lecturer influencing lecture delivery style; characteristics of the course being taught, in terms of academic level and subject matter; the degree of verbal interjection and interaction of non-native speakers of English with the lecturer during class, in comparison to the degree of this activity by native speakers of English during class; the format in which the lecture is delivered, in terms of the degree of interaction and the presence of the researcher in the classroom, whom the lecturer understands to be taping the lecture. These factors are mentioned in order to acknowledge the elusiveness of an ideal, representative American lecture course. These potential influences on listening comprehension in the lectures are acknowledged, but ignored in the analysis of the data because of the descriptive nature of this study concerning academic lectures. No experimental control group was established to isolate any of these variables to somehow measure a significant difference in lecture comprehension. Such experimental studies can grow from the existing descriptive and quantitative research, but they are not part of the present research.

Selection of specific professors for the study was determined by which particular professors were regular faculty members in their representative departments at Portland State University; i.e., no Summer guest lecturers

were included in the PSU samples. The three Lebauer transcripts -- for biology, ethnology and human development were for lectures taped in April of 1986, for research in ESL lecture comprehension, and for this reason were considered reliable samples of native speaker lectures. The lecturers thus included only native speakers of English for the primary and secondary data source.

RESEARCH PROCEDURES

Lecture Taping Procedures

Attending business and engineering classes for the purpose of listening to and taping lectures was performed as unobtrusively as possible. Preliminarily, this involved making contact with the lecturers prior to attending and taping their classes, which usually involved waiting in the hallway near the door of the classroom of the lecture, immediately prior to the scheduled class time. Carrying only a briefcase, which contained the recording equipment and a note pad, the researcher made initial contact with the professor at that time, with an informal self introduction and statement of purpose for attending the lecture. Specific objectives of tabulating phrasal verbs were not discussed, but rather only that the researcher was taping a broad sample of lecture styles, to gather data relevant to the comprehension of academic lectures by international students. It was therefore not necessary for me to interrupt the lecture to explain my research to the students. All of the lecturers were cooperative with the researcher, as well as friendly, carrying on with their lectures without any apparent modification of their lecture plans. One Management professor introduced the researcher to the

class, mentioning that taping was going to be in process, and asking if any special cooperation might be required. The researcher simply mentioned that they could proceed as normal, and "have a good time" as a lighter comment to help reduce self conscious responses beyond the normal classroom routines.

The actual taping of the lectures appeared not to be an major distractor from the lecture, but nevertheless was accompanied by a few technical problems. The tape machine was a Hitachi battery powered portable cassette recorder of about 2"x6"x10" size, and was kept in the briefcase of the researcher at all times, with the researcher clipping to his shirt a small clip-on microphone that was plugged into the tape machine. The researcher usually was seated in the first or second row of the classroom for better recording, but sometimes may have potentially served as a distraction during some of the smaller classes, because of a slight problem in attempting to unobtrusively turn over the cassette tape. Because of difficulty in smoothly getting the tape into the slot, the taping quality for Side 2 of one of the management classes was not acceptably audible for accurate transcription purposes. Additionally, of the three Engineering lectures taped, the tape for two of the lecture courses recorded was unreliable in sound quality for accurate transcription, because of interference of a previous recording on one cassette tape, and due to poor recording location for the other Engineering class attended. On two other occasions -- during a taxation policies class and a sociology class, problems with the tape player, possibly low on battery power, resulted in unusable recordings as well.

Transcription Procedures

Compiling transcripts from taped lectures involved the use of a Lanier transcription machine, available at the PSU AudioVisual Center, and a MacIntosh computer for word processing. The research assistant, discussed above, though not attending the lectures, listened to and transcribed seven of the eight tapes, inserting time markers on the transcripts at regular five minute intervals. These were then revised by the researcher, who not only attended the lectures, but also who could correctly hear and input colloquial or content specific expressions used by the lecturer, which were specific to either the U. S. culture or to the specific subject matter at hand. The researcher listened carefully to all the tapes while revising the transcripts made by the assistant. Every intelligible word was transcribed, including each time the lecturer repeated the same words due to lecturer startings and stoppings and reemphasis during lecture deliveries. Incomplete words and stutters, while not frequent nor tabulated separately, were counted by the MacIntosh computer word counter as part of each 1000 word segment. This fact could serve to slightly under-state the frequency of phrasal verbs per 1000 word lecture segment, since incomplete words or stutters were excluded from the phrasal verb count. These factors were not considered to result in a statistically significant difference in the mean number of phrasal verbs per 1000 word segment of lecture.

Each taped lecture was a minimum of 3000 words in length, allowing lectures to be divided into a minimum of three 1000 word segments. The rationale behind dividing the transcribed lecture into 1000 word segments was to enable phrasal verb counts to be undertaken based on a quantitative point of reference, a number of words, rather than time. Thus tabulation

counts could be compared among various segments of one or more lectures, not confounded by fluctuating lecturer delivery speeds. Fluctuating speeds of lecture deliveries made comparison of time segments inappropriate. This 1000 word category of quantitative assessment allowed the deletion of non-lecture talk by the instructor, such as talking less formally about classroom management before the lecture. Frequency tabulations for phrasal verbs was performed, based for the most part on the word count of lecture talk only, for the 1000 word segment of lecture. It is possible that occasional short parenthetical explanations acknowledging student interjections were inadvertently counted as part of the 1000 word segment, but this does not jeopardize the significant findings of the analysis, in regard to the frequency of phrasal verbs per 1000 words of lecture. Such inadvertencies would mean that the phrasal verb frequency counts were actually higher than reported, which would strengthen existing findings from the data. Finally, frequency tabulations for the various phrasal verb classifications were assessed for the entire lecture, so that frequency count comparisons could be performed which include not only the primary source material of lecture transcripts, but also includes the Lebauer transcripts of various lecture topics -- these latter transcripts serving as a secondary source of lecture transcript material for this study.

Transcript Analysis Procedures

Actual performance of the phrasal verb analysis commenced with a four page transcript from one of the lectures actually taped and transcribed for the research, which was designated for practice only. After extensive hours of explanation by the researcher to the second rater on the definition, semantic

distinctions and uses of phrasal verbs, the researcher provided the second rater of the transcripts with one hour of instruction on how to implement the semantic unity test and the WH Question test. The second rater analyzed and categorized the phrasal verbs on the practice script by first distinguishing phrasal verbs from other verb+preposition constructions, and then categorizing them as either FPV's or non-FPV's. The researcher checked the assistant's analysis of the transcript, discussing necessary corrections to be made, reemphasizing and demonstrating the guidelines for analysis.

RELIABILITY AND VALIDITY

Reliability coefficients were determined for inter-rater scoring of the three categories of phrasal verbs relevant to this study -- all phrasal verbs, figurative phrasal verbs only, and the non-figuratively classified phrasal verbs. In order to initially determine adequacy of interrater training in coding phrasal verbs, numerical counts of the first lecture transcript were compared for frequencies of the three categories of phrasal verbs for both raters. The Coefficient of Reliability was initially discovered to be unacceptable between the analysis of the researcher and the rater. This coefficient was based on tabulations by each rater of the numbers of each category of phrasal verb per 1000 words of the transcript. Both transcripts were marked identically for 1000 word segment boundaries. Rather than collaborating over any sections of the other rater's transcripts, the researcher reviewed the analysis techniques with the assistant, using additional examples of phrasal verbs versus verb plus preposition combinations not included in the transcripts. All coding of phrasal verbs was performed independently by both raters, and then subjected

to an item by item comparison to check reliability, no changes to the analyses henceforth being made. Subsequent independent analyses of the first transcript to determine the number of FPV's and non-FPV's per 1000 words of lecture, produced reliability coefficients of 73.2% and 80.0% respectively, and an overall reliability for all phrasal verbs of 74.0% This reliability was calculated by the following formulas with each number of identified phrasal verbs representing only a 1000 word segment of the given transcript:

TABLE I

COEFFICIENT OF RELIABILITY FORMULAS FOR ALL PHRASAL VERBS

1.	$\frac{\text{Number of commonly identified FPV's per 1000 words}}{\text{Number of Rater A identified FPV's} + \text{Number of Rater B identified FPV's}}$
2.	$\frac{\text{Number of commonly identified non-FPV's per 1000 words}}{\text{Number of Rater A identified non-FPV's} + \text{Number of Rater B identified non-FPV's}}$
3.	$\frac{\text{Number of commonly identified PV's per 1000 words}}{\text{Number of Rater A identified PV's} + \text{Number of Rater B identified PV's}}$

(Source: *Social Science Research Methods*. , Prentice-Hall, Inc., Englewood Cliffs, 1984.)

The quotient of each of these formulas produces the Coefficient of Reliability, a widely accepted measure for establishing interrater reliability for content analysis (Chadwick, Bahr & Albrecht 1984). On a 1000 word segment level, an individual lecture level, and on an overall level for the entire ten lectures, the Coefficient of Reliability was determined by the following formula:

TABLE II

GENERAL COEFFICIENT OF RELIABILITY FORMULA

Coefficient of Reliability =	$\frac{\text{Number of Units in Same Category}}{\text{Total Number of Units Coded}}$
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(Source: *Social Science Research Methods.* , Prentice-Hall, Inc., Englewood Cliffs, 1984.)

Overall Coefficient of Reliability was not high, but adequately above the acceptable threshold of 60% reported by Chadwick et. al. (1984). Overall results for the ten lectures were as follows:

TABLE III

INTERRATER RELIABILITY COEFFICIENTS -- ALL PHRASAL VERB CATEGORIES

Coefficient of Reliability =	$\frac{416 \text{ Units in PV Category}}{606 \text{ PV Units Coded}} = \underline{\underline{68.6\%}}$
Coefficient of Reliability =	$\frac{308 \text{ Units in FPV Category}}{421 \text{ FPV Units Coded}} = \underline{\underline{73.2\%}}$
Coefficient of Reliability =	$\frac{108 \text{ Units in non-FPV Category}}{185 \text{ non-FPV Units Coded}} = \underline{\underline{58.4\%}}$

The level of reliability achieved in interrater scoring appears acceptable, especially since it appears inevitable that some phrasal verbs are bound to overlap between two different categories. For example, to “write up” a report may be considered completive, since it involves writing with emphasis toward completion of it. There is also a sense in which to “write up” may be considered figurative in that for many it carries the connotation of a police officer saying “I’m gonna have to write you up,” “meaning issue you a citation”. Such ambiguity is inevitable in dealing with semantics, since meaning of forms changes with contexts.

The lower interrater reliability for non-FPV’s deserves attention. One possible explanation for this low score may likely deal with ambiguity in classification distinctions between literal phrasal verbs and verb plus preposition constructions. For example, for Business Management Quantitative Methods class, the researcher identified “putting out”, “coming out”, “come in” and “going up” as non-FPV’s, while the second rater considered “going up”, “putting out” and “coming out” as FPV’s, and “put in” as a verb plus preposition. Analysis involved examination of words not only as phrasal verbs versus verbs plus prepositional sequences (henceforth V+P), but also analysis of which variety of phrasal verb was present in each context.

Some ambiguous boundaries existed between the more literal PV’s versus the V+P sequences. In addition, some ambiguities also existed between FPV’s and non-FPV’s in unique, specific contexts of use. While varying contexts and boundaries lowered the overall score for interrater reliability for non-FPV’s, the 58.4% Coefficient of Reliability only represents 30.5% of the entire sample of phrasal verbs, such that overall reliability was attained at 68.6% Coefficient of Reliability

Measuring validity of the categories being measured in this study is subject to the ambiguities and abstractions of prescribing the categories according to semantic rather than syntactic definitions. Syntactic form is not adequate to distinguish phrasal verbs from other verb plus preposition constructions, nor to distinguish figurative from completive and literal phrasal verb constructions. This is clearly the case when phrasal verb homonyms are discussed (Nattinger & DeCarrico, in press), such as "run down":

"Don't run down your brother all the time."	"belittle"
"I have to run down the title for that book."	"find"
"The clock runs down every time I go on vacation."	"stop"

Figure 6. Phrasal verb homonyms. Source: Nattinger & DeCarrico in press.

Verb plus preposition constructions can be syntactically identical as well, such as "They run down the hill every morning."

Clearly, semantic notions of figurativity deserve careful consideration in determining the validity of this category, which may be more ambiguous than categories of completion or literalness. For example, while the phrasal verb "turn on" is figurative in the sense of "attack" or "betray", what about "turning on" the radio? On a comparative basis, the latter action carries much more literalness in the sense of switching the radio to an operative mode, and in many contexts this involves literally turning the "on" knob to that mode. Push button control panels in newer contexts give "turn on" the radio more figurativity, however, and this illustration is a clear indicator that

the validity of a literal semantic notion changes with changing environmental contexts. This obviously promises to generate increasing numbers of figurative terms, including the category of figurative phrasal verbs, as language functions in a world where literal forms change.

The categories of FPV and non-FPV represent a simplification of categories that were proposed by J.B. Fraser (1976, as cited by Nattinger & DeCarrico, in press). His categories were semantically defined as Figurative, Completive and Literal Phrasal Verbs. Completive phrasal verbs are characterized by the sense of completion compounded to the verb by the addition of the particle. An example of this is to be asked "to clean", versus being asked "to clean up." The latter request has a sense of completion in the request, while the first request to clean can be carried on indefinitely. Literal phrasal verbs consist of a unique composite meaning which is fairly close to the literal meanings of the verb and the particle, such as "to pull down the poster", "to hang up the laundry" etc. It is unrealistic to assume that the categories are completely mutually exclusive, as indicated above, regarding "write up" as a potentially figurative or completive phrasal verb.

This study was more concerned with the semantically least predictable phrasal verb combinations of verb plus particle, because of the greater frequency of FPV's in spoken English situations, and because it is the most difficult phrasal verb to teach and learn in ESL due to the semantic unpredictability of the meaning of the verb plus particle. In distinguishing FPV's from non-FPV's, the completive phrasal verbs were not included in the figurative category, but were considered non-figuratively classified so that the more semantically non-inferable phrasal verbs could be more isolated as a semantic category. It may be argued that figurative phrasal verbs should not

include metaphorical sets discussed in this study, where the particle “up” means “more”, and “down” means “less” in combination with the verb (Lakoff & Johnson 1980). The fact that given metaphorical sets often have an equally large set of counterexamples, e.g., where “more” is “down” and “less” is “up”, could make such metaphorical categories a more semantically complex and unpredictable category.

CHAPTER IV

RESULTS AND DISCUSSION

Descriptive and inferential statistics, charts and graphs were selected to analyze and present the findings of this study. The small sample size resulted in using more general statistic measures for analyzing the frequency of phrasal verbs, making it difficult to make strong inferences about frequency distributions for phrasal verbs by the selected lecturing population.

A DESCRIPTION OF GENERAL FINDINGS

Statistically significant results were obtained with the t-test for rejecting the null hypothesis for Research Question #1, at a confidence level of $P < .05$ (See Table IV). This means that the idea can be refuted that the frequency of phrasal verbs used by the eight American lecturers is not different from zero at a 5% level of statistical significance. Additionally, the null hypothesis that says that the above frequencies of the subcategories of phrasal verbs per 1000 words of lecture is not different from zero, can be statistically rejected for FPV's and non-FPV's, by the t-test analysis of the data. Mean values for the numbers of PV's, FPV's and non-FPV's for all eight lecturers are provided in Table IV.

TABLE IV

FREQUENCY OF PHRASAL VERBS FOR THE EIGHT LECTURERS
(FOR RESEARCH QUESTION 1)

Variable	N	Mean	Standard Deviation	t-test	P-Value for t-test
PV	8	8.237	1.822	12.868	<0.001
FPV	8	5.637	1.950	8.177	<0.001
non-FPV	8	2.650	0.883	8.487	<0.001

Frequency distributions for all categories of phrasal verbs were assessed, such that N = number of lecturers whose lectures contained at least three 1000 word segments. The three categories of phrasal verbs undergoing frequency distribution analysis were PV's, FPV's and non-FPV's.

Comparing distributions of FPV's and non-FPV's as matched pairs was implemented by the Wilcoxon Signed-Ranks Tests, as a composite eight member sample. This test was selected to determine if the frequency of FPV's was statistically significant over the frequency of non-FPV's. The Wilcoxon Test was chosen over the t-test because the t-test assumes normal frequency distribution, which the present lecture sample does not achieve. The Wilcoxon test does not assume normal distribution to measure significance, since it is a nonparametric test.

The most important general finding of this study builds on the affirmative conclusion for Question #1, to substantiate Question #2, that the average number of FPV's per 1000 words per lecturer is statistically significant, as more frequent than the average number of non-FPV's per 1000 words by the same lecturer. The Wilcoxon Signed-Ranks Test, a nonparametric test establishes statistical significance of FPV's as more frequent than non-FPV's for the eight lecture sample, at the 5% confidence level, without requiring

normal distribution. The t-test supports these findings of statistical significance (See Table II).

TABLE V

STATISTICAL SIGNIFICANCE FOR FIGURATIVE PHRASAL VERBS
(FOR RESEARCH QUESTION 2)

t-test					Wilcoxon Signed-Ranks Test				
Dependent Variables	N	Mean	S. D. Diff.	T (P-Val)		Signed +	Ranks -	Tie	Z (P-Val)
Non-FPV's		2.650			N	1	7	0	
	8		2.418	3.49	Mean				2.38
FPV's		5.637		(.0102) (P<.05)	Rank	1.000	5.000		(.0171) (P<.05)

The Wilcoxon Signed-Ranks Test indicates that there is one lecturer for whom the occurrence of non-FPV's was greater, and seven lecturers with whom the non-FPV occurrence was less. Thus the magnitude of the results of the Wilcoxon test is in terms of the number of cases in which the rank of one independent body of numerical data is statistically greater than the rank of a second independent body of numerical data.

When applied to the data as a secondary test, the t-test, rather than being relied upon as the primary test for the statistical purposes above, becomes a useful tool in generating new insights into the phrasal verb data. The t-test compares, for example, not the number of cases where the FPV's were significantly greater in number, but rather the size of the differences in means, which is significant at a 5% level of confidence.

While somewhat less central to the focus of this research, numerous other features of the data were explored through a variety of instruments of measure. Although not for the most part providing statistically significant results due to the sample sizes for various categories, findings from the data still suggested trends and topics for further explorations and research. Research Question #3 asked whether or not certain academic subjects tend to generate a significantly larger number of phrasal verbs in the lectures delivered by instructors, compared with the other academic subjects. The term “academic subject” was defined operationally by the three general academic disciplines specified below, as Business, Social Science, and Physical Science. The number of transcribed lectures under the business classification was adequate for determining statistical significance with this question, (N=4) (see Table III), using the t-test.

TABLE VI
PHRASAL VERB FREQUENCIES FOR BUSINESS COURSES

Variable	N	Mean	Standard Deviation
PV	4	9.025	0.892
FPV	4	6.475	1.087
Non-FPV	4	2.550	1.190

The number of lectures for physical science and social science on the other hand was too small (N=2) to measure statistical significance, in terms of PV's, FPV's and non-FPV's (see Tables IV and V).

TABLE VII

PHRASAL VERB FREQUENCIES FOR SOCIAL SCIENCE COURSES

Variable	N	Mean	Standard Deviation
PV	2	8.200	1.131
FPV	2	5.950	1.061
Non-FPV	2	2.250	0.071

TABLE VIII

PHRASAL VERB FREQUENCIES FOR PHYSICAL SCIENCE COURSES

Variable	N	Mean	Standard Deviation
PV	2	6.900	3.677
FPV	2	3.650	3.323
Non-FPV	2	3.250	0.354

Interdisciplinary comparison of phrasal verb occurrences thus could not be performed to show a significant difference in numbers of PV's, FPV's and non-FPV's among the three academic disciplines.

The sample size for the business fields was sufficiently large to implement the t-test, but not the Wilcoxon Signed-Ranks Test, to establish statistical significance at the 5% level for FPV's over non-FPV's. The t-test assumption of normal distribution was not attained. The Wilcoxon Test did not establish this significance, because adequate sample size, N=5 was not attained.

The possibility of a specific trend, though not statistically testable, was suggested by the fact that within the limited sample of data for the three academic disciplines stated above, the physical science courses appeared to have slightly above 50% above the number of FPV's per 1000 words of lecture

that were found in both social science and business. The smallness of the sample size however does not statistically establish the smaller physical science value to be significantly smaller than the social science and business values.

Discussion may be explored for the low FPV score per 1000 words for physical science in contrast with social science and business. Given the limited sample size of the two lectures, under the physical science category, it is unclear whether the Engineering lecture (with nearly two-thirds of its PV's being FPV, was the more normative of the two physical science lectures in occurrence of FPV's, or whether the lecture with less FPV's was a more representative physical science sample (See Table V).

TABLE IX

PHRASAL VERB FREQUENCIES FOR TWO PHYSICAL SCIENCE COURSES

ENGINEERING LECTURE

Per 1000 word segment	No. Of Phrasal Verb (PV)	No. Of Figurative Phrasal Verb (FPV)
First Segment	9	7
Second Segment	7	4
Third Segment	14	7
Fourth Segment		
Fifth Segment	8	6
TOTAL	38	24
Per Average 1000 word segment	9.5	6.0

BIOLOGY LECTURE

Per 1000 word segment	No. Of Phrasal Verb (PV)	No. Of Figurative Phrasal Verb (FPV)
First Segment	5	6
Second Segment	2	3
Third Segment	7	8
Fourth Segment	3	4
Fifth Segment		
TOTAL	17	5
Per Average 1000 word segment	4.3	1.3

Inspecting the first year biology transcript, an adequately detailed transcript produced at University of California at Irvine by another researcher, suggests numerous reasons for fewer FPV's. One possible reason is that it is likely an introductory course, and rather than being interaction oriented, it appears from the lack of student interjection to be a more monologue style of lecture, leading to a possible reduction in the use of idiomatic and figurative expressions. Other transcripts show evidence that the April 4th data of the biology lecture was still the first week of class, possibly explaining the lack of measurable student interjections. Another possibility for the lack of emergence of a clearly figurative or non-figurative occurrence of phrasal verbs is that not only was the Engineering class small (based on researcher observations) and interactive, but is also seemed to focus on mathematical formulas and abstract equations and relationships, as it dealt with spatial concepts in mechanical engineering, determining mathematical and numerical solutions. On the contrary, the Biology class appeared to be more typified by concrete and literal content (e.g., specific natural ecosystems and food chains, etc.). With the limited sample comprising only two lectures, the statistical evidence for the predominance of FPV's or non-FPV's is not significant or conclusive, apart from the incorporation of a larger sample of varieties of physical science and social science courses.

Another possible influence on the lower PV/FPV count in the Biology lecture is that after the first 600 words of the lecture, the instructor began a slide presentation and narration which continued through about the middle of the fourth segment until 3500 words were spoken. Throughout the lecture transcript, there is no suggestion of any teacher response to any student

initiated questions or comments. Furthermore, there is no indication of the level of the course, and hence, the level of expertise of the student and the size of American vs international student composition is not known. On the other hand, the Engineering chalk board story problems tended to invite student interjections and a generally informal atmosphere surrounding teacher talk in class.

The lack of noticeable student participation in the Biology class transcript may have been because the class session was one of the first for the academic quarter. In addition, it could also be lecturer style and class format for that particular day. While the Engineering class had only two or three international students, it is uncertain how many Internationals were in the Biology lecture. This latter point is relevant to consider because if the Biology lecture was dominated by International students, this could influence the lecturer to refrain more from the use of colloquial expressions to convey lecture concepts, in favor of more formal modes of expression that are generally more inferable for meaning of ideas.

Statistical analysis of the data from the lecture transcripts produced useful results to the main research questions and concerns of this study, but additionally revealed other statistical characteristics in the lecture data worth noting, as interesting topics for further research. Statistical comparisons of frequencies of phrasal verbs between academic subjects not only revealed the trends discussed for physical science, social science and business, but the statistics indicated measurable differences in mean scores for two different lectures by the same professor, in terms of average number of PV's spoken per 1000 words, for both lectures. While the number of PV's and and FPV's were not significantly different for the two Marketing lectures, numbers of PV's

and FPV's were significantly less in the second Marketing lecture, in contrast to the first lecture. Using both the Wilcoxon Signed-Ranks Test and the t-test, significance of phrasal verb count differences was derived for the Marketing lecture at a 5% confidence level.

TABLE X

PHRASAL VERB FREQUENCIES FOR TWO BUSINESS COURSES

MARKETING LECTURES

	LECTURE I		LECTURE II	
Per 1000 word segment	# of PV's	# of FPV's	# of PV's	# of FPV's
First Segment	13	10	7	3
Second Segment	10	7	5	3
Third Segment	11	11	5	3
Fourth Segment	8	8	6	3
Fifth Segment	7	6	1	1
Sixth Segment	6	6	6	6
Seventh Segment	10	9	7	3
TOTAL	65	57	37	22
Per Average 1000 word segment	9.3	8.1	5.3	3.1

MANAGEMENT LECTURES

	LECTURE I		LECTURE II	
Per 1000 word segment	# of PV's	# of FPV's	# of PV's	# of FPV's
First Segment	11	6	12	6
Second Segment	10	9	4	2
Third Segment	11	3	14	7
Fourth Segment	5	2	8	4
Fifth Segment	17	10	6	2
Sixth Segment	7	7	7	6
Seventh Segment	6	5	11	7
TOTAL	67	42	62	34
Per Average 1000 word segment	9.6	6.0	8.9	4.9

The significant drop of recorded PV's and FPV's per 1000 words of the second Marketing lecture merits exploration. While discourse analysis of such influences is beyond the quantitative scope of this study, further investigation into the specific functions of phrasal verbs in relation to the lecture content and the intent of the lecturer in such phrasal verb use, can yield a revealing qualitative analysis that goes beyond the frequency of use, into the context of use of phrasal verbs.

CHAPTER V

CONCLUSION

In this chapter, the outcomes of the research questions are reviewed.

General conclusions from the research findings are presented, along with the limitations of the study. Future implications for ESL teaching and ongoing research are suggested. Finally, the limitations of the study and suggestions for future direction are considered.

A SUMMARY OF THE FINDINGS

Research Question 1

Phrasal verb data was reliably categorized from eight native English speaking lecturers in American universities, for a total of ten lectures. Seven of the lectures being taped and transcribed by the researcher. Statistically significant findings were obtained, that phrasal verbs are spoken in American university courses by lecturing native speakers of English, at a mean value for the courses measured of 8.3 phrasal verbs per 1000 word segment. Of this figure, 5.6 figurative phrasal verbs per 1000 word segment are spoken by the lecturers, and 2.7 non-figuratively classified phrasal verbs per 1000 word segment are spoken.

Research Question 2

The mean value of 5.6 figurative phrasal verbs per 1000 word segment was found to be significantly greater than the mean value of 2.7 non-figuratively classified phrasal verbs per 1000 word segment. This means that for the ten lectures delivered by the eight lecturing native speakers of English, the frequency of figurative phrasal verbs was greater than the frequency of non-figuratively classified phrasal verbs, at a 5% level of confidence. This significance was determined through the Wilcoxon Signed-Ranks Tests, as a result for the entire sample. The findings were supported by the t-test at a 5% significance level, even though the normal distribution assumption of the t-test were not obtained.

Research Question 3

In regard to the frequencies of phrasal verbs among various academic subjects, determination that particular classification of phrasal verbs were significantly more frequent for particular academic subjects could not be statistically determined due to at least two limiting factors:

1. The sample sizes represented by each academic subject and each academic discipline were too small to make a statistically significant interdisciplinary comparison (e.g., 5 samples per academic subject to use the Wilcoxon test).
2. The frequency distribution for each category of phrasal verb data was negatively skewed, not providing the normal distribution necessary for statistical tests that are designed for testing small samples (e.g., the t-test)

CONCLUSIONS FROM THE FINDINGS

The findings of this study result in two major supportable conclusions -- that phrasal verbs are not merely found in non-academic environments outside of the classroom, but that beyond chance, they are an intrinsic part of lecture language for the lectures that were studied. Of the lecturers whose lectures were transcribed, 75% of these eight lecturers represented business and physical science courses. It is science and business which are found to rank among the highest enrollments by international students in the United States. The presence of numerous Asian students from the Pacific Rim countries in business courses such as International Marketing and Business Management (Quantitative Methods), which were taped and transcribed for this research, substantiates this claim found in recent research literature (Huckin & Olsen 1984).

The most significant conclusion from the findings of this research is that figurative phrasal verbs occur with greater frequency in university academic lectures in America than non-figuratively classified phrasal verbs. As linguistics literature points out, it is figurative phrasal verbs which are the most semantically difficult for international students who are seeking to infer their meaning. International students who may have the knowledge of the meanings of the components of the figurative phrasal verb may be idiomatically unprepared for the fixed polyword of very different meaning than the verb and particle components that were heard in the lecture. This is quite unlike the more literal and literary Latin based verb that they may have learned in their Grammar Translation course of English in their home country such as in China (See Burnaby & Sun, 1989), and other Asian

countries. Students from Chinese countries who focus on English study to pass entrance exams have a much greater likelihood at being unskilled with the Germanic structure of phrasal verbs, which have only recently been given greater attention in academic circles where Latin and French verb structures have dominated scholarly focus. General perceptions of phrasal verbs as a more folk language apart from academic study fail to acknowledge the frequency with which academic specialists in sciences and business use such verbs to cover the essential academic concepts their students are seeking to understand. Alternative strategies to academic lecture comprehension through text dependent study may be one recourse to the International student with poor lecture comprehension skills. The formation of a study group with one's co-nationals may be another approach to academic success without lecture comprehension (Yeh & Chu 1974) Neither the educator in English as a Second Language nor the student himself, can be assured that either or both recourses are sufficiently present for visiting International students to obtain academic success. The ESL instructor may likely be the most systematic exposure to the Germanic phrasal verbs of the English language that the student will encounter in his academic program in the United States.

LIMITATIONS OF THE STUDY

The subject of phrasal verbs has been discussed and analyzed and defined as a semantically unified, yet difficult and distinct verb construction with idiomatic characteristics which are quite distinct from verb plus prepositional sequences. We have demonstrated the syntactic similarity

between phrasal verbs and these counterparts, which, apart from native speaker fluency to differentiate between the two constructions, creates non-native speaker confusion in "chunking" phrasal verbs into syntactic slots with generalizable meanings. Linguists have stated that if phrasal verbs are semantically unified polyword,lexical phrases and not phrasal constraints with syntactic slots allowing for interchangeable components, then phrasal verbs will not usually lend themselves to the generalizing characteristics which are claimed to occur in listening comprehension (Nattinger & DeCarrico in press).

It has also been stated that while phrasal verbs are difficult to assimilate through "chunking" in generalizing meaning for the non-Germanic international student, they likewise represent colloquial, spoken form of English that is not prevalent in academic writing (McArthur 1989), and which are not critical to study in order to pass English foreign language exams. Meanwhile, research indicates that many international students place the accomplishment of academic goals above pursuing oral fluency in spoken English (Yeh & Chu 1974). Their goals for English language study are instrumental rather than integrative. If enhancing educational and professional status is predominantly more central to the purposes of Chinese students studying English than deepening their intercultural awareness or intercultural friendships (Klein 1974), then it is understandable why Chinese educators and students consider the study of English for communication to be peripheral to their objectives for using English (Burnaby & Sun 1989). The problem then arises, as Olson & Huckin assert (1990), that even non-native speakers with good scores on their English language proficiency exams sometimes have severe problems understanding academic lectures, even

when such lectures are well organized and well presented (1990). If the lecture is more than mere repetition of the textbook content, then the non-native speaker may fail to comprehend important course content that is disseminated through the spoken language medium (Olson & Huckin 1990). This research establishes that phrasal verbs are not only a statistically significant interjection of colloquial English into academic lecture environments, but that the figurative phrasal verbs, with the greatest semantic obscurity between the verb and the particle, are significantly more numerous than the other categories combined -- those of literal and completive phrasal verbs.

There are methodological limitations to the present research which deserve attention. The sampling procedure, for example, was flawed in that it didn't include a large number of different lecturers in all of the academic disciplines being sampled -- of physical science and social science. Six of the seven taped and transcribed lectures were in one academic discipline only, that of business. And thus the sample looked more longitudinal than cross-sectional. Yet research question 3 suggests that the research tries to be both longitudinal and cross-sectional. Such mixing of designs clouded the researcher's sampling priorities, so that the researcher taped longer and fewer lecture segments rather than the more useful approach of shorter segments for more courses. The latter approach could have been implemented without large additional time expense for collecting, transcribing and analyzing the data. The business sample was fairly large, consisting of four different business classes, and two of these taped for two sessions. Some of the sessions were taped for 90 minute sessions, which could have been shortened to 50 or 60 minutes per lecture. Repetition of courses could have been foregone to

bring about taping of more classes. The end result would have been a larger number of lectures taped and transcribed, resulting in a more normal distribution in the statistical data. This more normal distribution in turn would allow for the use of the t-test as a more reliable and powerful primary test for statistical significance for research questions 1, 2, 3, rather than a secondary support test to the nonparametric Wilcoxon test.

Given the limited number of lectures that were analyzed, it is clear that the framing of comparative questions was a poor design choice for the study, for Question 3, and other discarded comparative questions that were included with the original research proposal. Better questions would have compared only categories for which adequate sample sizes were available. Using 1000 word segments within a lecture as a category allows frequency comparisons for two or more long lecture transcripts, such as the two marketing classes and the two management classes, since each class contained over 7000 words in lecture material. If the question has useful implications to the researcher, it would be a better question design for the available data.

Another effective design would have asked questions that required less of a time consuming analysis. For example, this study could have focused on existence and frequency of phrasal verbs in general, but then avoid the additional questions, of frequencies of subcategories of phrasal verbs., such as FPV's and non-FPV's. This could have freed more time for taping and transcribing more lectures, thus assuring a large enough time to tape a large enough sample of courses, so that the data would come out more in normal distribution. The frequencies of the occurrences of subcategories of phrasal verbs could have then become a subject for further research, or an aspect of the study assumed by other research team members, people who could also

have adequate time to refine their coding skills for the various categories of the study, thus creating a higher interrater reliability.

A final limitation of this study is one of theoretical relevance of the data. For example, while it is true that this study establishes the significant presence of phrasal verbs in academic lectures, and especially figurative phrasal verbs, it has not been determined what the occurrences of these PV's means to the overall comprehension of the lecture for non-native speakers of English. Richards (1983) addressed this very issue when he pointed out that the issue of central concern in listening comprehension theory is the question of the nature of the units listeners use to understand language: *"Do we listen for intonation, stress, words, grammar,, sentences, or some other unit?"* Likewise, other researchers argue that sentence level linguistic deficiencies such as in vocabulary, pronunciation and grammar may be much less serious lecture comprehension concerns than those which occur on the discourse level (Olsen & Huckin 1990). If phrasal verbs function as fixed polywords with a single lexical and unified meaning, and figurative phrasal verbs form a semantically unpredictable yet composite meaning, then it is arguable that the study and acquisition of phrasal verbs is largely a vocabulary concern. This contrasts such discourse level concerns as lexical phrases as macromarkers listening strategies.

IMPLICATIONS FOR TEACHING

The findings of this study result in very tangible and useful implications for curriculum considerations for ESL in the United States, as well as for EFL in such non-Germanic language speaking countries such as

China and Taiwan. One implication of this research particularly pertains to EFL educators with larger numbers of students pursuing academic degrees in Business Management, Marketing, Accounting, and Quantitative Methods in the United States. This current research implies that international students arriving in the U.S. to study these fields will encounter phrasal verbs in the their lecture courses, and many of these phrasal verbs will be figurative in meaning. This is not to suggest that the occurrences of these FPV's and non-FPV's will be a central element in overall lecture listening comprehension; nevertheless, its mere existence in the lecture, even as a more vocabulary level feature of the lecture, can serve as a hindrance or distractor from more accurate comprehension if there is difficulty inferring phrasal verb meaning from the verb and the particle. While it is beyond the scope of this study to argue causality, that not understanding phrasal verbs means lack of comprehension of the lecture, the study still has useful implications. One implication of this study is that the existence of phrasal verbs in American lectures gives weight to the inclusion of phrasal verbs in EFL curricula, at least on the vocabulary level. Teaching metaphorical sets can help these students infer meaning for a number of FPV's, where "up" is "more" and "down" is "less" in verb plus particle meaning. Additionally, instruction on literal and completive categories can greatly reduce the number of ambiguous cases of FPV's. The remaining FPV's without semantically generalizable categories can be integrated with other vocabulary building exercises, where use in correct contexts facilitates learning of one word synonymous meanings.

SUGGESTIONS FOR FURTHER RESEARCH

The scope of this research in regard to phrasal verbs in academic lectures has been the frequency distribution of phrasal verbs in the lecture environment, particularly for figurative phrasal verbs. Beyond this quantitative analysis, discourse analysis would be an insightful study into how often phrasal verbs affect meaning at the discourse level, such as functioning in a lexical phrase as a macromarker, rather than affecting meaning at a sentence level. For example, the illustration below suggests that phrasal verbs can function at both the sentence level and the discourse level in a lecture:

Sentence Level:	<i>"The U.S. trade deficit in '89 <u>turned out</u> to be a significant variable in the strength of U.S. currency abroad."</i>
Discourse Level:	<i>"<u>As it turns out</u> , the U.S. trade deficit is only one of several variables influencing the strength of the U.S. currency in foreign markets. ["turns out" functions as part of a lexical phrase "as it turns out" which functions as a topic shifter toward subsequent additional information to be focused on in the lecture.] Other variables that we need to keep in mind are.."</i>

Gathering a larger sample of lecture transcripts to determine how often phrasal verbs influence lecture meaning at a discourse level could add weight to the incorporation of phrasal verb emphasis in curricula for lecture comprehension courses, such as in courses for English for Academic Purposes. Experimental research into more effective and simplified teaching approaches leading to acquisition of figurative phrasal verbs can make an important follow up to the present research. Additionally, experimental research measuring impact on listening comprehension from ESL phrasal

verb instruction may generate new pedagogical insights into teaching listening comprehension. Further exploration for teaching phrasal verbs as fixed idiomatic polywords can compare discrete point deductive explanatory instruction to contextualized, content based and integrative approaches that facilitate student acquisition of phrasal verbs. Snow & Brinton's adjunct model for integrating English instruction and content instruction is a useful context for such research (Snow & Brinton 1988).

The data compiled from this study can be readily augmented for further useful research regarding phrasal verbs. Gathering additional lecture transcripts for more social and physical science courses will generate a large enough collection of samples to measure possible statistically significant differences in the numbers of particular varieties of phrasal verbs, as compared among the three academic disciplines. Additional phrasal verb categories could be considered for Research Questions 1 - 3, such as separating completive from literal phrasal verbs, and possibly a fourth category of metaphorical set phrasal verbs could be proposed, and tested for interrater reliability.

Whether or not phrasal verbs occur significantly at the discourse level, or are primarily functioning at the sentence level, research indicates that effective listening comprehension in academic lectures involves the necessity of being able to predict meaning at all levels, including the phonetic, syntactic, lexical and discourse levels, with non-native speakers of English implementing strategies to more effectively predict meaning at each of these levels (Lebauer 1984). The evidence for the significant occurrence of phrasal verbs in academic lectures, especially the figurative phrasal verbs, underscores the idea that promoting acquisition of phrasal verbs at the

sentence or discourse level can have useful implications for non-Germanic international students seeking communication and friendship with native speakers of English, but also, perhaps more importantly from their perspectives, for the fulfillment of academic objectives through the effective comprehension of a very present component of academic lectures.

REFERENCES

- Brock, Cynthia A. (1986). The effects of referential questions on ESL classroom discourse. *TESOL Quarterly*, 47-59.
- Burnaby, Barbara, and Yilin Sun (1989). Chinese teachers' views of Western language teaching: Context informs paradigms. *TESOL Quarterly*, 23: 2, 219-238.
- Call, Mary Emily (1985). Auditory short-term memory, listening comprehension, and the input hypothesis. *TESOL Quarterly*, 765-781.
- Celce-Murcia, Marianne, and Diane Larsen-Freeman (1983). *The Grammar Book: An ESL/EFL Teacher's Course*. Cambridge, Newbury House Publishers, 265-279.
- Chadwick, Bruce A., Howard M. Bahr & Stan L. Albrecht (1984). *Social Science Research Methods*. Englewood Cliffs, Prentice-Hall, Inc., 249-250.
- DeCarrico, Jeanette, and James R. Nattinger (1988). Lexical phrases for the comprehension of academic lectures. *English for Specific Purposes*, Volume 7, pp. 91-102.
- Gaies, Stephen J. (1983). The investigation of language classroom processes. *TESOL Quarterly* 17, 2: 205-217, as reprinted in *Methodology in TESOL* (1987). Long & Richards, eds. New York, Newbury House Publishers, pp. 329-338.
- Grice, H., (1975). 'Logic and Conversation'. In Cole and Morgan, *Speech Acts*, pp. 41-58.
- Huckin, Thomas N., and Leslie A. Olsen (1984). The need for professionally oriented ESL instruction in the United States. *TESOL Quarterly*, 273-294.
- Judd, Elliot L. (1981). Language policy, curriculum development, and TESOL instruction: A search for compatibility. *TESOL Quarterly* 15, 1:59-66, as reprinted in *Methodology in TESOL* (1987). Long & Richards, eds. New York, Newbury House Publishers, pp. 3-9.

- Klein, Marjorie H., Milton H. Miller and A. A. Alexander (1974). "When Young People Go Out in the World." *Youth, Socialization, and Mental Health*. Ed. William P. Lebra. Honolulu: The University Press of Hawaii, 1974. 217-232.
- Lakoff, George, and Mark Johnson (1980). *Metaphors We Live By*. Chicago, The University of Chicago Press
- Lebauer, Roni (1984). Using lecture transcripts in EAP lecture comprehension courses. *TESOL Quarterly*, 41-54.
- McArthur, Tom (1989). The long-neglected phrasal verb. *English Today*, Cambridge University Press, Volume 5, Number 2, 38-44.
- Meyer, George A. (1975). *The Two Word Verb: A Dictionary of the Verb-Preposition Phrases in American English*. Paris, The Hague.
- Nattinger, James R., and Jeanette S. DeCarrico (forthcoming). *Lexical Phrases For Teaching*.
- Olsen, Leslie A., and Thomas N. Huckin (1990). Point-driven understanding in Engineering lecture comprehension. *English for Specific Purposes*, Volume 9, pp. 33-47.
- Palmer, F. R. (1968). *A Linguistic Study of the English Verb*. Coral Gables: University of Miami Press.
- Pica, Teresa, Richard Young & Catherine Doughty (1987). The impact of interaction on comprehension. *TESOL Quarterly*, 737-758.
- Quirk, Randolph, and Sydney Greenbaum (1973). *A Concise Grammar of Contemporary English*. New York: Harcourt Brace Jovanovich, Inc.
- Richards, Jack C. (1983). Listening comprehension: approach, design, procedure. *TESOL Quarterly*, 219-240.
- Snow, Marguerite Ann, and Donna M. Brinton (1988). Content-based language instruction: Investigating the effectiveness of the Adjunct Model. *TESOL Quarterly*, 553-574.
- Yeh, Eng-Kung and Hung-Ming Chu. The images of Chinese and American character: Cross cultural adaptation by Chinese students." *Youth, Socialization, and Mental Health*. Ed. William P. Lebra. Honolulu: The University Press of Hawaii, 1974. 200-216.

APPENDIX A

INTERRATER GUIDESHEET

INTERRATER GUIDESHEET

(FOR DISTINGUISHING PHRASAL VERBS PREPOSITIONAL PHRASES AND PREPOSITIONAL VERBS):

- I. Semantic Unity Test -- This is the basic criterion for distinguishing phrasal verbs from all other "verb+preposition" combinations.

-- changes in meaning for either the verb or the particle when combined in specific use were considered conclusive indicators for the construction as that of a phrasal verb. Some particles for complete phrasal verbs, however, such as "up", combine with a limited number of main verbs to function in the sentence in terms of to "V completely". This function is not generalizable in allowing the conclusion that all "verb+up" combinations are complete phrasal verbs specifically, and even phrasal verbs in general.

-- ability to substitute one word synonyms or simple synonyms in place of the verb construction indicates the semantic unity of the verb sequence, making it likely a phrasal verb.

-- substitution test -- changing the verb or the particle will cause, in most cases, a complete meaning change in the original verb or particle, if the verb is a phrasal verb. The exception to this rule is when the original verb+particle combination and its substitute come from the limited set of "verb+up" complete verb combinations.

- II. The WH Question Test -- For Distinguishing Transitive PV's from other V+P's

This is "basically a functional test in that the main criteria are the type of possible answers to WH questions, and whether it involves 'who' or 'what' [indicating that the lexical material following the verb is a noun phrase, and the direct object of the phrasal verb] as opposed to 'where', 'when', or 'why' [indicating that the lexical material following the verb is a prepositional phrase functioning as an adverbial of place, time, manner, and so on] . The type of answer thus reveals the function of the preposition following the verb, namely, whether it functions as a phrasal verb particle (or particles) or as a preposition introducing the adverbial phrase" (DeCarrico and Nattinger, in process). The only verb+preposition construction not distinguishable from phrasal verbs in this way are the prepositional verbs, which like the phrasal verbs can be converted to "who" or "what" WH- questions. Distinguishing phrasal verbs from prepositional verbs can be performed effectively by means of the semantic unity test, where the composite meaning of the verb+particle of the former is not equal to the sum of the meanings of the parts, but rather where a unique composite meaning results which can usually be encapsulated in a one-word synonym, in contrast to prepositional verbs:

I looked over the article./ I scanned the article. (PhrasalVerb)

I looked over the fence./ I peered over the fence. (Prepositional Verb)

APPENDIX B

FREQUENCY DISTRIBUTION CHARTS

FREQUENCY DISTRIBUTION CHARTS
(ADDRESSING RESEARCH QUESTION 1)
Phrasal Verbs in General

Label	Value	Frequency	Cumulative Frequency	Percent	Cumulative Percent
Biology	4.3	1	1	12.50	12.50
Ethnology	7.4	1	2	12.50	25.00
Accounting, Taxation	7.7	1	3	12.50	37.50
Human Development	9.0	1	4	12.50	50.00
Marketing	9.3	1	5	12.50	62.50
ISQA/Mechanical Engineering	9.5	2	7	25.00	87.50
Management (Quant. Method)	9.6	1	8	12.50	100.00

Number missing = 0 (0.00 percent of observations processed)

Statistics on 8 observations with non-missing data:

Mean = 8.287 Standard deviation= 1.822
Median= 9.150 Variance= 3.318

FREQUENCY DISTRIBUTION CHARTS (ADDRESSING RESEARCH QUESTION 1)

Figurative Phrasal Verbs

Label	Value	Frequency	Cumulative Frequency	Percent	Cumulative Percent
Biology	1.3	1	1	12.50	12.50
Ethnology	5.2	1	2	12.50	25.00
Accounting, Tax	5.8	1	3	12.50	37.50
ISQA/Management/Engineering	6.0	3	6	37.50	75.00
Human Development	6.7	1	7	12.50	87.50
Marketing	8.1	1	8	12.50	100.00

Number missing = 0 (0.00 percent of observations processed)

Statistics on 8 observations with non-missing data:

Mean = 5.637 Standard deviation= 1.950
Median= 6.000 Variance= 3.803

FREQUENCY DISTRIBUTION CHARTS
(ADDRESSING RESEARCH QUESTION 1)
Non Figuratively Classified Phrasal Verbs

Label	Value	Frequency	Cumulative Frequency	Percent	Cumulative Percent
Marketing	1.2	1	1	12.50	12.50
Accounting (Taxation)	1.9	1	2	12.50	25.00
Marketing/Ethnology	2.2	1	3	12.50	37.50
Human Development	2.3	1	4	12.50	50.00
Biology	3.0	1	5	12.50	62.50
ISQA, Mechanical Engineering	3.5	2	7	25.00	87.50
Management	3.6	1	8	12.50	100.00

Number missing = 0 (0.00 percent of observations processed)

Statistics on 8 observations with non-missing data:

Mean = 2.650 Standard deviation= 0.883
Median= 2.650 Variance= 0.780

APPENDIX C

SAMPLE TRANSCRIPTS FROM TAPING

SAMPLE TRANSCRIPTS FROM TAPING

BUSINESS MANAGEMENT 531 -- QUANT METHODS (1000 WORDS)

...how many times must you be allowed to play the game? (Students responded) Bunches. A lot. You see this used on bidding and so forth, you know, where they, they're gonna go, we're going to make one bid on this thing, and they put in all these probabilities, frequencies, and, and then they make the decision and, and then, and that's a high risk. The other assumption here is um, is um, marginal utility for money is identical. You can afford to lose a buck as well as make a dollar. An example, what, you know you have a ninety percent chance of making a whole month but you have a ten percent chance of losing more than half. Even though the expected value is really good, if you can't stand the heat, then you can't play the game. So, that concept is in it. Another thing is, and you, you know, when the fellow is speaking on the throne, the guy that wrote the boxes and so forth, and he said um, you know, it's, we need to know the probability. You know, it's, it's easy to get this, it's probably more difficult to get these numbers. So, you know, unless it's a pretty deterministic type game, there's a lot of, of variability that's sort of left out of these kinds of application. (Student asked question). That's an excellent question. He's saying, (student introjected), I'm sitting here, fifteen with seventy, the, and, instead of this one, let's say it was fifty-six? Is that what you was saying? (Student affirmed). Fifty-six. Where would I go? I'd move back up. Now, if you simulated that, or if you went ahead and did fifteen to sixteen here, they would be very very close. Be--, but, this one would be the bigger one. This one would be the bigger one. Now, let me ask you a question. What, what um, here's an interesting "what if" question, sort of post optimality after I got the right answer, you always kind of flex the answer and try to decide how strong it is. I'm sitting here at fifty-two. Here's a question. How would you solve it? What would the loss, I, I'm guessing profit loss there. What would the profit have to change to before I would order one less. Now, think about this for a second. Think, think mechanically or conceptually how you'd do it. I'm sitting here, where was I? Sitting here at fifty-two. I'll go back to the original.

I'm back at fifty-two. This is what we've got. Zero point five two. And you've done all the work, and you've got all the answers. Part B is the test, the mid-term. We'd say this. What would P have to change to before you would order one less. Now, tell me how you'd do that. (Students responded and interacted with the professor). What would be the first one that would move off of here. Right now I'm, I'm pretty, I'm down below sixteen. I would stay with sixteen up to fifty-five if, if the indifference probability went to fifty-six. Let this thing float, instead of being, let this go to fifty-six. I'm asking you, I'm holding one of these variables constant, and varying the other, if this one to fifty-six, would that be enough to move me off the previous, that's it. So I would substitute in here point five six, leave my loss the way I've got it over here, and solve for the unknown p. Would it go, up or down? (Student responded).. It'd go down, wouldn't it? I'm, I'm being even more conservative. As I move up this, I'm going to, you know, I'm getting real conservative about this behavior and so the question which way we'd go, you basically, what, what, how about order one more? See, it'd just take a tiny bit below this to move me back here, just like your question. The other question is, how much would it have to, how much would p have to go the other direction before I order one more? (Students responded). I have to hit right on top of this one. I, fifty-four wouldn't do it. Fifty wouldn't do it. Forty-eight, thirty-five would do it. So, what, what I'm suggesting is we're varying this constant to where we're computing over here and then holding one of these constant and seeing which way the other one goes. (Student commented). That would be good. What would not be good would be seventy. I'd get real nervous if you said seventy, but if you said fifty-five five, fifty-seven, you know, but if you had, if you felt like you had to go like clear right to here, then you don't appreciate it'd just take a little bit to get off the _____. O.K. Alright. Why don't you send those up. (Students hand in homework). O.K. Tonight, what we want to get through is a single subject. When you get done tonight, you want to be the leading experts in this area. (Laughter). You've got alot of reading material on this. _____ you've got a full chapter in the Godman reference book. We've got full chapter in the Anderson book, Anderson-Sweeney book, and we have, the probably the most significant chapter, it's in the syllabus, and it's the Harper-Siguro article.

Harvard Business Review reprint, um pages twenty-one to thirty. Maybe twenty-one to thirty-one. So, we've got a lot of technical support for this. What I'm asking from you in terms of accountability, one is, a essay concept outline response to the question discussed worked out. You put together a framework for this subject discussed work, and I'll take you through one, that at least give you a direction guide. Whatever you put together, it's up to you but I want you to have a pretty good appreciation for the breadth and depth of this subject. O.K. And that's one thing. And that is typically I'm looking for mid-term on that.

1000 WORD SECTION -- 400 LEVEL INTERNATIONAL MARKETING

You know, I don't know how many of you watch late night T.V., but all those, they used to have, I don't know it's been awhile, I but I sort of indelibly marked in my mind, are the box car Willie ads, (laughter) ya know, the K-tel kinds of ads where, ya know for \$5.98 or \$15.98 or whatever it is, you can order direct with an 800 number. It's the home shopping myth that's available. So there's a move, technology is pushing the direct market. In the Japan, one of the ways to get around this distribution network, is to try to go right after the customer. Market directly to the customer. Upscale catalogs. A number of American catalog merchandisers are doing very well in the Japanese market. Um, some other firms have decided to use other strategies. I read recently that Toys-R-Us is building its own stores in Japan. Not in Tokyo, but somewhere out in the hinterlands, I'm not sure exactly which city it is. Um, but, for example, they gave a, I think that this was in the Wall Street Journal, an example of a city where, the population was several hundred thousand people, where there was about 700 different toy stores. So a city that's probably, not a whole lot larger than the metro area of Eugene, you have 700 toy stores. (Well) Toys-R-Us is planning to come in with one store capture about 60 percent of the volume,/. Um, its sort of a revolution in retailing. Now politically, there's, ya know there's some, the 700 shopkeepers aren't gonna like that, right? (Student: "They've actively fought it, just within the last couple months...") They're not doing this in Tokyo, why? (Student "Why, probably too much clout from the retail. The, the retailers under under Japanese law have the right to object ... ya know 700 mom and pop

shoppes) So you know they're legal whether it's ya know, Toys-R-Us going into Japan, or its Toys-R-Us or McDonald's trying to go into an area, uh Greenwich Village. They have laws in terms of the structure of the store. There's a legal environment, the political environment is very important to distribution. Um, some classic examples of firms that have sort of, I think, looked at innovations, and how to reach the customer. You walk back a hundred years ago, the Sears & Roebuck, or Montgomery Ward's were innovations at that time in distribution. The catalog merchandising, which was in essence _____ similarities to what's happening today. You know it gave rise to major organizations that didn't exist. And it gave rise to, to major organizations that didn't exist. What caused the catalog um market to be something that Sears could do a hundred years in 1880s, 1890s. What factors made that a viable option? (Student responded). O.K. So there's poor distri, poor distribution but um someone else said trans (student introjected). There's the rail transportation. Rail transportation made Sears' business economically viable. You know, they, they had something in on an ox cart, send from, you know, Kansas City to Oregon, good luck. But, but rail traffic made it possible in terms of providing reliable, timely, economical, transportation. So it was a technological innovation. Rail transportation. The U.S. Postal system was also being developed at the same time which allowed a medium for contact between the company and the customers. Na, nationwide postal network, developing rail network, technology made this available, a new opportunity. Um, so yeah, the, the, it was a new idea, new channel of distribution. After the war, the United States, if you look at firms like Avon. Avon couldn't get its products carried in stores that primarily sold cosmetics. Department stores. Um, um, beauty parlors that sold cosmetics. They couldn't get their products sold, they didn't have the clout. So what they decided to do was to use an alternative distribution network. They went direct with their own sales force. Um Amway did the same thing. So there's, I think alot of creativity sometimes in distribution. There's existed, existing channel, structures that are in place, sometimes that those existing channels structures aren't going to be um very amenable to carrying a new product. You know, what alternatives exist. Um, and there's been other examples of the direct, direct marketing is the fastest growing area of marketing today and

has been for about the last five years. Um, I'm, I'm not sure what the percentage growth rates today are but three or four years ago it was about a fifty percent annual rate. Of course you can't sustain that fifty percent annual rate for a very long time. Um but it's opening up a lot of interesting opportunities. So Mobil companies in Oregon, have done quite well. Um Portland, um Norm Thompson, _____ is a good example. Southern Oregon, the um, Harry and David, is a good example of a mail order. Very sophisticated companies, who maintain close customer contact. The uh, use of technology today, it's not the railroad, it's not the postal service, it's the use of computer. Having a computer data base to qualified customers. Tracking what customers have done in the past. What purchasing, purchase patterns of customers. You know, providing higher levels of service. Land's End has done a pretty good job although recently, I understand they're having some problems. The market may be changing a little bit for them in terms of uh, I don't know if it's quite a, there's um more competitors out there, some people claim some of the yuppie buying patterns, are, are changing. I'm not quite sure they're all Land's End's problems. Like even turn to another example, of a company that came out of nowhere _____ fairly rapidly in establishing a _____ position in the marketplace. So, distribution I think is, is, is really an interesting area in with respect to what's happening here in Portland. That's one of the major industries here in Portland, distribution. There's more than just, you

MECHANICAL ENGINEERING – 200 LEVEL STATICS

frictional force that resists the, the motion um, and this, this frictional force is what's called mew-K and, or mew-K is the um, coefficient of kinetic friction. And we're not going to be using that too much in here, when you get to, um two fifteen dynamics we'll be using kinetic friction more because, the thing, there's more things that are moving in dynamics. Why the drop, do you think? Why does the friction force decrease after the thing starts sliding? (Student responded). Yeah, that's about all there is to it. In, in other words, where does friction come from in the first place. It comes from, um, if you look at it at um microscopic picture of the um, interface, the frictions come from the fact that little bumps are interlocked, or hooked up. Um, in order to

move, really, it's got, gotta rise up um a little tiny amount so that so that um, the bumps are riding past each other um once it gets up there, it's easier to push it because they're not interlocked as much. So no matter how slow, it's moving. We're not talking about kinetic energy or anything like that, just as long as it's moving, it takes less force to, to um, keep it going. And if you know, you probably experience that if you're, if you're pushing on something really heavy, um, and then once, once it starts to move, you know, it's like there's a decrease in, in force, you can push it easier. Push it something ahead you might almost fall down once it starts to move. Um, so friction force depends only on the coefficient which depends only on, on the contact, the materials in contact and the norm--, normal force. Total normal force. What about contact area. (Student asked question). Now this is total force though. That's gonna be the same. For example I'm talking about it's um, um, this, this is one case, and then this is a smaller contact area, Same normal, same total normal force. (Student asked question). Doesn't it depend upon the area at all? (Student responded). Yeah, I know, from that kinetic equation but doesn't seem like it should? (Student responded). Higher contact pressure. That's not gonna affect the friction? (Student responded). And that would slide easier or slide harder? (Student responded). Slide the same. O.K. Is everybody comfortable with that? (Instructor mumbled to self). Um, well, I remember I first took statics this really bothered me, and I'll show you why it bothered me. That's why it bothered me. Does everybody know what that is? Um, that's a dragster, for those of you who didn't study on Saturday. Um, and, these wheels back here, what, what, what do these wheels look like? And they're about this wide, about this wide, and they're smooth. And, ya know I just have a, have a hunch, that they were worried about you know, making the rubber stick to the road, which seems like friction um, and they, they're making the tires so wide, so, so doesn't seem to make sense, that the contact area doesn't fit in here. (Student asked question). Um, not that much smaller. I bet when they're spinning real fast they're still about this wide. I mean according to this, we can put those bicycle wheels on the back, and get just as much friction. What's going on? Either we don't know what we're doing or they don't know what they're doing, or maybe there's a option in there somewhere. (Student made comment). O.K. Yeah, you're right. What.

what is it? (Student responded). Um, no, not, not, not directly related. It's, it's something, I see what your're saying. Um, it's, it's not set in order as far as affecting this. But there's, there's another phenomenon that's going on that's making it do that. (Student asked question). An inverse square law between what? (Student repeated question). I don't think so. I'm not sure what that means. (Student responded). Okay um, when these guys take off, there's a big grey cloud that comes off the back. What is that? What's that grey cloud? (Student responded). Yeah, it's rubber. It's vaporized rubber, tire, that's coming off. (Student asked question). Yeah, that can give you more weight, more efficiently than building big wide tires. (Student asked question). Actually what, what's really going on, um, I can tell you guys aren't near as worried about this as I was when I was _____ (laughter). Um, what, what's going on is, is the rubber is sticking to the road O.K. But, it's tearing off. The rubber is tearing off. When, when the tire spins, it's not, not a friction barrier, it's a shear barrier in the rubber. And um, um, if you, if you look at a chunk, um, of that rubber and shear, um, that, that's dependent upon, upon the ultimate shear stress on the rubber which is load divided by area. And so, you can, you can reduce the shear stress um, by increasing the area. So that's what they're doing. They're increasing the area um to get more, you just bite off a bigger piece of rubber to make it harder to, to shear the rubber off. So nothing to with the exertion. So, you can still use this. (Student asked question). Um, relative to this? (Student expanded on question). (Tape changed sides). A force is to be determined, um, or impending motion um set at equal to, at max which is $\mu \cdot S$. Um, and solve for the other force. In other words, F is not an unknown. When I say that this is F_{max} , which leaves $\mu \cdot S$. Because I'm saying what's the maximum P that we can get until its just ready to slide. Well if our impending motion um at that point, The friction force is gonna be the maximum that we can get. And then solve, back solve