

A Research Informed Approach to Stress Rule Selection for English for Academic Purposes (EAP) Programmes

Jocelyn Howard

School of Māori, Social and Cultural Studies, College of Education

University of Canterbury

Private Bag 4800, Christchurch 8140, New Zealand

Tel: 0064-3-345-8247 E-mail: jocelyn.howard@canterbury.ac.nz

Abstract

English word stress rules are numerous and are also notoriously prone to exceptions. As a result, arbitrary decisions are frequently made within English as a Foreign Language (EFL) programmes about which stress patterns warrant explicit instruction. Considerations such as the age and stage of the target learners, the teaching/learning context, and specific course objectives further complicate decisions about which rules should be accorded priority in a particular programme. This paper reports on a study undertaken to determine which English word stress rules should be prioritised in an English for Academic Purposes (EAP) course for mature students. A systematic analysis of the Academic Word List (AWL), applying three primary criteria (frequency of word use, degree of rule regularity, and degree of productivity), indicates that a focus on three rules in particular would help EAP learners predict the position of the stressed syllables in newly encountered academic words. These rules are discussed in relation to the three primary criteria, as well as with reference to the contribution they may make to EAP learners' functional intelligibility, oral fluency and ongoing vocabulary growth.

Keywords: Word stress rules, Stress prediction, Stress position, English for Academic Purposes, Academic Word List, Vocabulary acquisition

1. Introduction

There appears to be broad agreement among writers in the fields of phonetics and phonology about the important role of suprasegmental features for efficient and intelligible interactions in English. Lexical stress, in particular, is regarded as a critical clue for accurate comprehension of English by native speakers, and this has led a number of phoneticians to advocate that stress placement be accorded high priority in pronunciation programmes for English as a Foreign Language (EFL) learners (Benrabah, 1997; Harmer, 2007; Kenworthy, 1987). In fact, in highlighting the importance of stress for native-speaker comprehension, Brown (1997) asserts that rather than merely being “an adjunct to a correctly pronounced sequence of consonants and vowels”, stress must be viewed as “*the essential framework* within which (these) are related” (p. 51, italics added).

Because not all languages have stress, and those that do vary considerably in the manner in which it is applied and the way it impacts on intelligibility and comprehensibility, most writers concur on the need for attention to word stress in EFL programmes. There is considerably less agreement, however, about exactly how the production of correct stress patterns should be taught, or indeed which patterns warrant explicit instruction. This is due, in part, to the unpredictable variations in English stress behaviour that result from the interplay of multiple factors, including historical, syntactic, phonological and morphological influences. Stress placement has been viewed as such a highly complex matter in some quarters that it has resulted in many theorists and practitioners advocating that students learn the stress of individual words as part of the acquisition process for each new lexical item (e.g., Jones, 1962; O'Connor, 1980; Roach, 1991). However, the regularity of stress patterns across some word groups has led to observations that the relative prominence of syllables within English words is “not entirely capricious” (Knowles, 1987, p. 117), and a number of attempts have been made to formulate sets of ‘rules’ to both describe and predict stress placement (e.g., Arnold, 1957; Burzio, 1994; Chomsky & Halle, 1968; Fudge, 1984; Halle & Keyser, 1971). Because of the sometimes very large number of exceptions to many of these ‘rules’, however, they are often referred to rather more circumspectly as “patterns” (Carr, 1999, p. 88), “generalisations” (Bauer, 2009, p. 140), “tendencies” (Yavaş, 2006, p. 152), “regularities” (Giegerich, 1992, p. 183), “general statements” (Kreidler, 2004, p. 198), “general principles” (Jones, 1962, p. 249), or “sign-posts” (Short, 1967, p. 32).

Despite these challenges in predicting stress placement in English words, and the common focus in language classrooms on what Brown terms “unstressing” (1997, p.53), it would seem there is potential value in teaching particular ‘rules’ in certain circumstances. It would also seem that the greatest benefit is likely to be where those rules apply with a high degree of regularity to specific groups of words that are high use/high need for specific learners, or are highly productive in terms of application to new words, and are subject to few or predominantly low frequency exceptions. These criteria form the basis for this study which aims to identify a limited number of key rules of English word stress for classes of mature mixed nationality students undertaking English for Academic Purposes (EAP) programmes in preparation for tertiary study.

With many university courses now demanding higher levels of oral competence to cope with

components that require in-class interaction and presentations, as well as group projects and assignments, four goals for pronunciation instruction proposed by Morley (1991) have also been taken into account when evaluating individual stress rules for this study. These are functional intelligibility, functional communicability, increased self-confidence, and speech monitoring and modification strategies for use beyond the classroom (Morley, 1991, p. 500). Accurate stress patterning is an essential part of word acquisition that will facilitate learners' mastery of the first two of Morley's goals, and it also contributes to growth in self-confidence as learners' ability to speak and be understood in an academic context increases. Targeted attention to specific stress rules, in learners' own speech as well as that of others, may also contribute to oral competence and intelligibility improvements beyond the immediate context of learners' study.

A final consideration in determining which word stress rules will provide maximum benefit in an EAP programme is the diversity of students' post-programme academic pursuits. These frequently necessitate the acquisition of different sets of discipline specific vocabulary by different students. However, students in EAP courses also share the need to become competent users of the general academic language that is common across their target disciplines. The Academic Word List (AWL) (Coxhead, 1998) is a useful foundation for programme planning to achieve this.

2. The Academic Word List

A number of rank frequency word lists have been developed over the past five decades (e.g., Champion & Elley, 1971; Praninskas, 1972; Xue & Nation, 1984), primarily with English language teachers and learners in mind. Such lists generally provide a helpful platform for word selection in EFL programmes, so that learners are focused on and encounter the vocabulary that will be of most relevance for them. Arguably the best known word list is the General Service List (GSL) developed by West (1953), comprising the first 2 000 most frequently occurring words in English. Although researchers and academics have questioned the adequacy of the GSL due to its age (Richards, 1974), and the relatively low range and frequency of items in the list beyond the first 1 000 words (Engels, 1968), a comparable alternative has not yet been produced.

The Academic Word List, as the name suggests, is a much more targeted inventory of words than the GSL. It was compiled by Coxhead (1998) from a corpus of 3.5 million running words of academic text drawn from 28 subject areas, to identify which words are most needed for study at a tertiary level. The list contains 570 word families that occur regularly in academic texts, and specifically excludes words which occur in the GSL. Word families in the AWL include the inflected forms of each base word, as well as the most frequent, productive, and regular derived forms, based on Level 6 of Bauer and Nation's (1993) taxonomy. The list accounts for approximately 10% of the total words encountered in academic texts, with 94% of the words occurring in 20 or more of the 28 disciplines canvassed. As Coxhead (2000) explains, although the list does not contain the technical vocabulary specific to some individual subject areas, the 570 word families are nevertheless shared by several fields of tertiary study and are supportive of a wide range of academic topics (p. 214). This makes the AWL a key tool for

informing vocabulary teaching and learning goals in EAP programmes, and supports its use in this study to identify key word stress rules that will provide maximum returns for teachers and learners in these programmes.

The 570 word families in the AWL are presented in ten sublists, each containing 60 families, except for Sublist 10 which has 30 families. The sublists are arranged alphabetically by rank-ordered frequency, with Sublist 1 containing the sixty most frequent words, Sublist 2 containing the next most frequent words, and so on. Each word family is arranged under its headword (the stem noun or verb form), with the most frequently occurring word in each family italicised (see Sublist 1 in Appendix 1 as an example). The frequency of occurrence of words in the sublists falls quickly after Sublist 1 (which accounts for more than one third of the coverage of the whole list), with Sublist 4 words, for example, providing just twenty five percent of the coverage of Sublist 1 (Coxhead, 2000, p. 228). This disproportional coverage is taken into account in this study as individual stress rules are evaluated.

3. Method

As stated earlier, the aim of this research was to identify a limited number of English word stress rules to prioritise in programmes which prepare classes of EAP learners from diverse backgrounds for tertiary study. The AWL was used as the basis for the study, and the following primary criteria have been applied:

1. Frequency of word use;
2. Degree of rule regularity and predictability, including number and frequency of exceptions;
3. Degree of rule productivity.

A two pronged approach was utilised for the investigation, which proceeded in a non-linear manner focussing alternately on published stress rules and on the composition of the AWL.

An initial examination was undertaken of a number of seminal works on English word stress (Fudge, 1984; Jones, 1962; Short, 1967), as well as English language learning texts which focus on pronunciation (Carr, 1999; Cruttenden, 2008; Geigerich, 1992; Kreidler, 2004; Roach, 1991; Yavaş, 2006). This elicited some very simple rules or tendencies (e.g., one word has only one stress; words are normally stressed on the first syllable), and a number of very general rules (e.g., most two-syllable nouns and adjectives have stress on the first syllable; prefixes are not stressed in most two-syllable words; most compound verbs carry stress on the second part). A large number of very specific rules were also noted during this initial examination (e.g., the suffix *-ish* does not affect stress placement in adjectives, but verbs with stems of more than one syllable ending in *-ish* always carry stress on the penultimate syllable). Clearly, these rules vary greatly in terms of the breadth of their application, the 'weight' they carry in transmitting a message, their regularity, independence and the number of documented exceptions.

The AWL was then analysed to determine the number of constituents with specific suffixes and prefixes, the number of words belonging to specific word classes, and the length (in

number of syllables) of each word. Further analyses were then conducted to determine which rule(s) catered for each of these groups of words. The degree of productivity of rules which applied to large groups of words was then evaluated, along with their regularity, and whether the words they applied to in the AWL appeared more predominantly in earlier sublists (with greater coverage in academic texts) or later ones.

The discussion which follows provides further details of the analyses conducted to determine which rules to prioritise, along with pertinent theoretical and pedagogical considerations in relation to each of the rules.

4. Results and Discussion

Close analysis of the AWL indicates that the following three English word stress rules should be included in a programme for EAP learners.

1. All inflectional suffixes are stress-neutral.
2. Words with the suffix *-ion* carry primary stress on the final syllable of the stem.
3. Specified disyllabic word-class pairs have initial stress when functioning as nouns or adjectives, and final stress when functioning as verbs.

4.1 All Inflectional Suffixes are Stress-neutral

While the addition of some suffixes to English base words changes the stress pattern in the resulting words, there are over 40 derivational suffixes in English which have no impact at all on the primary stress placement in many stems. It would seem productive, therefore, to capitalise on learners' existing knowledge of stress patterns in words they have learned and facilitate further vocabulary growth by providing them with a list of these 'stress-neutral' suffixes. One problem with such an approach, however, is that many of these suffixes are "mixed" (Fudge, 1984, p. 40); that is, they operate as stress-neutral in some contexts, but induce very different stress patterns in others (e.g., *-age*, *-ance*, *-ery*, *-ise*, *-ment*, *-ure*). Determining whether these mixed suffixes will be stress-neutral or stress-changing (and how), very often requires learners to follow a complex series of 'if-then' steps (sometimes with large numbers of exceptions), and the value of teaching many of these as rules is questionable. Other stress-neutral suffixes behave in a more predictable manner, but occur with such relatively low frequency (e.g., *-dom*, *-let*, *-ways*) that focussed attention on these in an EAP programme is also unwarranted.

In contrast to derivational suffixes though, the impact of inflectional suffixes (plural and third person singular *-s/-es*, past tense *-ed*, past participle *-ed/-en*, present participle *-ing*, comparative *-er*, and superlative *-est*) on word stress is very predictable; they are always stress-neutral when they attach to an unbound form, and consequently the primary stress in the stem remains the same. However, this regularity is not sufficient on its own to recommend classroom attention to these suffixes; factors such as frequency of occurrence and impact on learner confidence also need to be considered.

Analysis of each of the 570 word families in the AWL shows that in 44% of the word families the most frequently occurring item is not the headword, but, rather, one of the closely related

affixed forms. Of these, one is prefixed, 143 are suffixed derivations of the headword, and the remaining 106 words are inflected forms (see Table 1).

Table 1. Most frequently occurring member of each word family in the AWL by type

Sublist	Headword	Affixed forms		
		Inflectional suffix	Prefix	Derivational suffix(es)
1	39	8		13
2	29	12		19
3	28	16		16
4	37	13		10
5	37	7		16
6	31	12		17
7	37	8		15
8	30	8		22
9	34	15	1	10
10	18	7		5
Total	320	106		143

The high frequency of these inflected forms in the most frequently used items within each word family suggests that the impact of inflexional suffixes on stress patterning warrants explicit attention in a pronunciation programme. Although these affixes are not productive in terms of generating new words, and the value of teaching what is, in essence, a ‘null case’ may be questioned, their high level of reliability and frequency justifies the explicit teaching of the stress-neutral inflectional affixation rule.

It should be noted that the existence of derivational suffixes which take the same form as some of the inflectional suffixes may be a potential source of confusion for learners. However, this is the case for only two suffixes (–*en* and –*er*) and, with the exception only of the agentive –*er* attaching to a bound base, all instances of derivational forms of these suffixes are also stress-neutral.

4.2 Words with the suffix –ion carry primary stress on the final syllable of the stem

Further analysis of the AWL, with a particular focus on suffixed derivations in the most

frequently occurring words within each word family, indicates that 52% of the 143 words in this category are formed with one of just three derivational suffixes (*-ic*, *-ion* and *-ity*), and that one suffix alone (*-ion*) is responsible for 61 of these words (see Table 2).

Table 2. Occurrences of derivational suffixes in the AWL by sublists (SL)

Suffix	SL1	SL2	SL3	SL4	SL5	SL6	SL7	SL8	SL9	SL10	Total
<i>-able</i>					1						1
<i>-al/-ial</i>		2			1		3		1		7
<i>-ance/-ant</i>		2	2						1	1	6
<i>-ary</i>						1			1		2
<i>-ation</i>	1		1	1	1	1	2	1		1	9
<i>-ence/-ent</i>	2	1		1		1			1	1	7
<i>-er</i>		2									2
<i>-ial</i>	1										1
<i>-ic</i>	1				2			1			4
<i>-ical</i>							1				1
<i>-ion</i>	3	9	9	6	6	8	5	10	4	1	61
<i>-ional</i>	1			1							2
<i>-is</i>	1										1
<i>-ity</i>		1	1		1	3		3			9
<i>-ive</i>			1			2	1				4
<i>-ix</i>								1			1
<i>-ly</i>							2	5	1	1	9
<i>-ment</i>	1	1		1	3		1	1			8
<i>-ous</i>									1		1
<i>-se</i>	1										1
<i>-ship</i>			1								1
<i>-um</i>			1								1
<i>-ure</i>	1				1						2
<i>-y</i>		1				1					2

These suffixes belong to the small, but very productive group of “pre-stressed suffixes” (Fudge, 1984, p. 41), which ‘fix’ primary word stress on the final syllable of a stem. However, because of its particular productivity in forming new nouns from verbs, and its regularity, both in the AWL and in general, the *-ion* suffix merits individual attention. Kingdon (1958, pp. 92-93) lists 160 words formed with the suffix *-ion*, and many more appear in other accounts of English stress (e.g., Fudge, 1984; Short, 1967). The only exceptions noted to the

pre-stressed rule for *-ion* appear to be *O`rion* and *`dande,lion* (Kingdon, 1958), although one further exception may be *television*, where both *,tele`vision* and *`tele,vision* can be heard. (Note 1)

This regularity in primary stress patterning also extends to secondary stress placement in all the *-ion*-suffixed derivations up to five syllables long, with alternating stressed and unstressed syllables preceding the primary stressed syllable (e.g., *,demon`stration*, *in,vesti`gation*). This high degree of regularity in secondary stress patterning provides further justification for inclusion of the '*-ion*-rule' in an EAP programme.

It is worth noting that, in addition to the 61 words in the AWL that end with *-ion*, there are an additional nine words ending with *-ation*. Although in many cases the *-ation* suffix is actually a double suffix, *-ate* plus *-ion*, in each of its occurrences in the AWL it acts as a single suffix (i.e., it is not possible to form an *-ate* form in any of these instances) which belongs to a sub-group of stress-fixing suffixes where the primary stress attaches to the suffix itself. Because *-ation* is disyllabic, and the stress attaches to the initial syllable of the suffix, this has the effect of placing the primary stress in these words immediately before the final syllable *-ion* (also the result of the *-ion*-rule). It may be of value to inform learners' that a different stress rule underpins this outcome.

4.3 Specified disyllabic word-class pairs have initial stress when functioning as nouns or adjectives, and final stress when functioning as verbs

There are at least twenty disyllabic words in the AWL which represent pairs of words with identical spelling, in which primary stress placement (and therefore vowel quality in many instances) depends on whether the word is used as a noun or adjective (initial syllable stress, e.g., *`contract*) or a verb (final syllable stress, e.g., *con`tract*) (see Table 3). Collation of other lists of two-syllable words which exhibit this functional stress change, indicates that there are at least a further ninety words in English which follow this pattern (Bauer, 2009, p. 140; Fudge, 1984, p. 32; Cruttenden, 2008, p. 248; Kingdon, 1958, pp. 45-46; Short, 1967, pp. 35-37; Yavas, 2006, p. 157). The frequency of such word pairs in the AWL and the GSL (West, 1953) is a key reason for recommending the inclusion of this particular rule in an EAP programme. However, it is further justified by the contextualised opportunity that teaching this rule provides for foregrounding the 'nouns-early, verbs-late' tendency in English word stress. Additionally, although this rule does not facilitate vocabulary growth in the way that derivational affixation does, accurate application of the rule further contributes to learners' functional intelligibility.

Table 3. Word-pairs in the AWL which exhibit class differentiation with stress

Sublist 1	contract export proceed process
Sublist 2	conduct impact transfer
Sublist 3	(comment)
Sublist 4	contrast project
Sublist 5	compound conflict reject
Sublist 6	abstract transport
Sublist 7	convert extract
Sublist 8	prospect
Sublist 9	confine converse
Sublist 10	incline

Cruttenden (2008, p. 249) advocates attention to the word-class pair rule as one of two items of advice on English stress patterns for foreign learners, but sensibly cautions against the indiscriminate application of the rule to other words which can also function as both nouns/adjectives or verbs (e.g., *report*, *reserve*). Another potential problem arises from a lack of agreement about some word pairs; *comment*, for example, is listed by Kingdon (1958, p. 45) as following the word-class pair rule, yet is highlighted by Cruttenden (2008, p. 248) as an exception to this rule, and is not listed by some dictionaries as exhibiting noun-verb oppositional stress. Bauer (2009, p. 140) also notes that *research*, which once followed the noun-verb pattern, now exhibits variable stress in both classes, and stress placement for *survey* as a verb depends on its semantic context.

5. Conclusion

The analysis of the AWL reported in this article employed frequency of word use, degree of rule regularity (including frequency of exceptions), and degree of productivity as primary criteria to make a principled decision about the selection of English word stress rules that would benefit learners undertaking an EAP programme. Less easily measurable indicators, such as the contribution a rule may make to the target learners' functional intelligibility, their oral confidence, and their ongoing language development were also considered. The findings indicate that in the specific context of a programme that prepares mature learners for high level English-medium academic study, explicit teaching of the stress-neutral inflection rule, the pre-stressed *-ion*-rule, and the word-class pair rule is warranted. Clearly, many learners undertaking EAP courses will already be familiar with other English word stress rules, and additional rules may warrant explicit attention as instances of their application arise during a

course. However, the complexity of many English word stress rules dictates that learners would still do well to heed the advice of Short (1967, p. 32) who strongly recommends the use of a reliable dictionary to check stress placement if learners are at all in doubt.

References

- Arnold, G. F. (1957). *Stress in English words*. Amsterdam: North-Holland.
- Bauer, L. (2009). *LALS 513: Description of English 2*. Wellington, New Zealand: Victoria University of Wellington.
- Bauer, L., & Nation, I. S. P. (1993). Word families. *International Journal of Lexicography*, 6(4), 253-279.
- Benrabah, M. (1997). Word stress – a source of unintelligibility in English. *IRAL: International Review of Applied Linguistics in Language Teaching*, 35(3), 157-165.
- Brown, G. (1997). *Listening to spoken English* (2nd ed.). Harlow: Longman.
- Burzio, L. (1994). *Principles of English stress*. Cambridge: Cambridge University Press.
- Campion, M. E., & Elley, W. B. (1971). *An academic vocabulary list*. Wellington, New Zealand: NZCER.
- Carr, P. (1999). *English phonetics and phonology*. Oxford: Blackwell.
- Chomsky, N., & Halle, M. (1968). *The sound pattern of English*. New York: Harper & Row.
- Coxhead, A. (1998). *An academic word list* (English Language Institute Occasional Publication No. 18). Wellington, New Zealand: Victoria University of Wellington. [Online] Available: <http://www.victoria.ac.nz/lals/resources/academicwordlist/information.aspx> (May 3, 2010).
- Coxhead, A. (2000). A new academic word list. *TESOL Quarterly*, 34(2), 213-238.
- Cruttenden, A. (2008). *Gimson's pronunciation of English* (7th ed.). London: Hodder Education.
- Engels, L. K. (1968). The fallacy of word counts. *International Review of Applied Linguistics in Language Teaching*, 6(3), 213-231.
- Fudge, E. (1984). *English word-stress*. London: George Allen and Unwin.
- Giegerich, H. J. (1992). *English phonology: An introduction*. Cambridge: Cambridge University Press.
- Halle, M., & Keyser, S. J. (1971). *English stress: Its form, its growth, and its role in verse*. New York: Harper & Row.
- Harmer, J. (2007). *The practice of English language teaching* (4th ed.). Harlow: Pearson Longman.

- Jones, D. (1962). *An outline of English phonetics* (9th ed.). Cambridge: Cambridge University Press.
- Kenworthy, J. (1987). *Teaching English pronunciation*. Harlow: Longman.
- Kingdon, R. (1958). *The groundwork of English stress*. London: Longmans, Green.
- Knowles, G. (1987). *Patterns of spoken English*. Harlow: Longman.
- Kreidler, C. W. (2004). *The pronunciation of English: A course book in phonology* (2nd ed.). Oxford: Blackwell.
- Morley, J. (1991). The pronunciation component in teaching English to speakers of other languages. *TESOL Quarterly*, 25(3), 481-520.
- O'Connor, J. D. (1980). *Better English pronunciation* (2nd ed.). Cambridge: Cambridge University Press.
- Praninskas, J. (1972). *American university word list*. London: Longman.
- Richards, J. (1974). Word lists: problems and prospects. *RELC Journal*, 5(2), 69-84.
- Roach, P. (1991). *English phonetics and phonology: A practical course* (2nd ed.). Cambridge: Cambridge University Press.
- Short, D. (1967). *A guide to English stress*. London: University of London Press.
- West, M. (1953). *A general service list of English words*. London: Longman, Green.
- Xue, G., & Nation, I. S. P. (1984). A university word list. *Language Learning and Communication*, 3(2), 215-229.
- Yavaş, M. (2006). *Applied English phonology*. Malden, MA: Blackwell.

Note

1: The symbol ` is used in this article to indicate primary stress and , is used to indicate secondary stress.

Appendix

Appendix 1. Sublist 1 of the Academic Word List (Coxhead, 1998)

Each word family is arranged under its headword (the stem noun or verb form). The most frequently occurring word in each family is italicised.

<i>available</i>	contextual	derivative
availability	contextualise	derivatives
unavailable	contextualised	<i>derived</i>
<i>benefit</i>	contextualising	derives
beneficial	uncontextualised	deriving
beneficiary	contextualize	distribute
beneficiaries	contextualized	distributed
benefited	contextualizing	distributing
benefiting	uncontextualized	<i>distribution</i>
benefits	<i>contract</i>	distributional
<i>concept</i>	contracted	distributions
conception	contracting	distributive
concepts	contractor	distributor
conceptual	contractors	distributors
conceptualisation	contracts	redistribute
conceptualise	<i>create</i>	redistributed
conceptualised	created	redistributes
conceptualises	creates	redistributing
conceptualising	creating	redistribution
conceptually	creation	economy
consist	creations	<i>economic</i>
consisted	creative	economical
consistency	creatively	economically
<i>consistent</i>	creativity	economics
consistently	creator	economies
consisting	creators	economist
consists	recreate	economists
inconsistencies	recreated	uneconomical
inconsistency	recreates	<i>environment</i>
inconsistent	recreating	environmental
constitute	<i>data</i>	environmentalist
constituencies	define	environmentalists
constituency	definable	environmentally
constituent	defined	environments
constituents	defines	establish
constituted	defining	disestablish
constitutes	<i>definition</i>	disestablished
constituting	definitions	disestablishes
constitution	redefine	disestablishing
constitutions	redefined	disestablishment
<i>constitutional</i>	redefines	<i>established</i>
constitutionally	redefining	establishes
constitutive	undefined	establishing
unconstitutional	derive	establishment
<i>context</i>	derivation	establishments
contexts	derivations	<i>estimate</i>

estimated	reformulated	interprets
estimates	reformulating	misinterpret
estimating	reformulation	misinterpretation
estimation	reformulations	misinterpretations
estimations	<i>function</i>	misinterpreted
over-estimate	functional	misinterpreting
overestimate	functionally	misinterprets
overestimated	functioned	reinterpret
overestimates	functioning	reinterpreted
overestimating	functions	reinterprets
underestimate	identify	reinterpreting
underestimated	identifiable	reinterpretation
underestimates	identification	reinterpretations
underestimating	<i>identified</i>	involve
evident	identifies	<i>involved</i>
evidenced	identifying	involvement
<i>evidence</i>	identities	involves
evidential	identity	involving
evidently	unidentifiable	uninvolved
<i>export</i>	<i>income</i>	issue
exported	incomes	issued
exporter	<i>indicate</i>	<i>issues</i>
exporters	indicated	issuing
exporting	indicates	<i>labour</i>
exports	indicating	labor
factor	indication	labored
factored	indications	labors
factoring	indicative	laboured
<i>factors</i>	indicator	labouring
finance	indicators	labours
financed	<i>individual</i>	<i>legal</i>
finances	individualised	illegal
<i>financial</i>	individuality	illegality
financially	individualism	illegally
financier	individualist	legality
financiers	individualists	legally
financing	individualistic	legislate
<i>formula</i>	individually	legislated
formulae	individuals	legislates
formulas	interpret	legislating
formulate	<i>interpretation</i>	<i>legislation</i>
formulated	interpretations	legislative
formulating	interpretative	legislator
formulation	interpreted	legislators
formulations	interpreting	legislature
reformulate	interpretive	<i>major</i>

majorities	processing	similarity
majority	require	similarly
<i>method</i>	<i>required</i>	<i>source</i>
methodical	requirement	sourced
methodological	requirements	sources
methodologies	requires	sourcing
methodology	requiring	<i>specific</i>
methods	<i>research</i>	specifically
<i>occur</i>	researched	specification
occurred	researcher	specifications
occurrence	researchers	specificity
occurrences	researches	specifics
occurring	researching	<i>structure</i>
occurs	respond	restructure
reoccur	responded	restructured
reoccurred	respondent	restructures
reoccurring	respondents	restructuring
reoccurs	responding	structural
<i>percent</i>	responds	structurally
percentage	<i>response</i>	structured
percentages	responses	structures
<i>period</i>	responsive	structuring
periodic	responsiveness	unstructured
periodical	unresponsive	<i>theory</i>
periodically	<i>role</i>	theoretical
periodicals	roles	theoretically
periods	<i>section</i>	theories
<i>policy</i>	sectioned	theorist
policies	sectioning	theorists
<i>principle</i>	sections	vary
principled	<i>sector</i>	invariable
principles	sectors	invariably
unprincipled	<i>significant</i>	variability
<i>proceed</i>	insignificant	variable
procedural	insignificantly	<i>variables</i>
<i>procedure</i>	significance	variably
procedures	significantly	variance
proceeded	signified	variant
proceeding	signifies	variants
proceedings	signify	variation
proceeds	signifying	variations
<i>process</i>	<i>similar</i>	varied
processed	dissimilar	varies
processes	similarities	varying