

# The effectiveness of retrospective interviews in L2 word association research

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Categorizing word association test responses is an imperfect science, which requires a certain degree of subjectivity on the part of the researcher. In an effort to reduce this subjectivity, the use of retrospective interviews (i.e. asking subjects to provide reasons for their responses) has been recommended (Meara, 1983; Fitzpatrick, 2006). On the surface, this appears promising, as it aims to extract information directly from the participants following the test. However, by comparing retrospective interview responses with those from concurrent interviews, this study shows that subjects often had difficulty explaining why they responded the way they did, with some individuals forgetting or even changing their reasons during the second interview.

連想語反応の分類は、研究者側の主観がある一定の割合で入るので、科学的には不完全である。この主観性を軽減するために、後方視的インタビュー（すなわち、被験者にそれらの反応に対する理由を尋ねる）を行うことが推奨されてきた。これは、参加者から直接情報を得ることを目的としているので一見期待できそうであるが、二回目のインタビューの際に、被験者が最初になぜそう反応したかを説明することが困難なことが多く、中にはその理由を忘れてしまったり、その理由を変えたりする者もいる。この研究は、第二外国語の連想語テストにおける後方視的インタビューの有効性と信頼性を検討するために、逐次的インタビュー（最初の質問の直後にその理由を尋ねる）と、後方視的インタビュー（質問が全て終了した後に二回目のインタビューを行う）とを比較したものである。

**W**ORD ASSOCIATION tests (WATs) are generally used in second language (L2) vocabulary acquisition research studies to investigate the lexical connections L2 learners hold in their developing mental lexicons. Although WATs are helpful in better understanding the complexities associated with L2 lexical organization, they are not without their faults. The most notable problem with many of the past studies utilizing WATs is that associations are often “extremely boring and predictable” (Meara, 1983, p. 29). When high frequency nouns and adjectives are chosen as stimulus words, the responses produced are quite mundane, as participants tend to respond somewhat uniformly. It is not until low frequency stimulus words are used, representing a broader spectrum of word class, that researchers can observe more intriguing response patterns.

In order to attain meaningful results, WATs require numerous stimulus words and many willing participants to provide responses, which necessitates the analysis of vast amounts of



data. The process of classifying responses is quite labor intensive and the results are subjective. In an effort to simultaneously reduce both the workload and subjectivity in classifying responses, the use of retrospective interviews has been suggested for use in word association studies (Fitzpatrick, 2006). Retrospective interviews attempt to elicit the reason behind the response to the stimulus words after the test has been administered.

This paper examines the effectiveness of retrospective interviews and evaluates the necessity of including an interview stage in word association studies. Before detailing the study, some background related to the connection between word associations and analyzing the structure of the mental lexicon will be discussed. The following sections will outline some problems with WATs in general and the classification procedures in particular. Retrospective interviews will then be introduced and discussed as a possible means of eliminating subjectivity during classification. The research study will then be presented, followed by a description of the results, a brief discussion, and conclusion about the usefulness of retrospective interviews in WATs.

### Understanding the lexicon through word associations

Recent estimates place the number of words in the English language at anywhere from 400,000 to over 2,000,000 (see Schmitt, 2000, pp. 2-3). Even the most conservative estimates produce numbers that are surely quite overwhelming to most L2 learners of English, not to mention the teachers who are responsible for expanding their students' vocabularies.

It is not easy to identify success in vocabulary acquisition as it is a gradual process (Meara, 1983), and learning often manifests itself quite differently depending on the individual and their

preferred learning style. Knowing precisely how L2 learners store and organize the words in their minds would be immensely helpful in finding more beneficial vocabulary teaching techniques.

How newly acquired words are stored in the mental lexicon is an area that has long been of interest to linguists. Useful insights about the organization of the mental lexicon have come from studies involving specific kinds of dysfunctions, such as those seen in aphasic individuals (Bandera, Della Sala, Laiacona, Luzzatti, & Spinnler, 1991), malapropism errors (Fay & Cutler, 1977) like those scattered throughout Shakespeare's *Much Ado About Nothing*: "Our watch, sir, have indeed *comprehended* two *auspicious* persons" (act 3, scene 5), and "blends" (Aitchison, 2003) made by normal subjects attempting to activate two words simultaneously (e.g. glass + cup = *glup*). The mistaken utterances observed in the previous examples give clues as to the relative location or proximity of two words, or groups of words, within the lexicon. However, since such techniques require unique test subjects or very opportune timing, in the case of catching a "slip of the tongue", a simpler, more accessible technique for language researchers is the WAT. Word association data can help researchers understand how a learner's existing vocabulary is stored and offer insights into the acquisition of new words.

Some early studies utilizing WATs focused on the effects of age on L1 responses (Ervin, 1961), the effects of word class (Deese, 1962), the effects of bilingualism (Kolers, 1962), and producing word association norms (Palermo & Jenkins, 1964; Deese, 1965; Umemoto, 1969; Church & Hanks, 1990; Moss & Older, 1996). Recently, however, some studies have been more concerned with comparing L1 and L2 lexical organization (Wolter, 2001; Zareva, 2007), using WATs to assess L2 proficiency (Wolter, 2002), and even individual profiling (Fitzparick, 2007). The next section details some drawbacks associated with word association research.

## Problems with word association research

Research studies employing WATs have had their supporters and skeptics over the years. Richards (1976, p. 82) suggested that “word association tests give a great deal of information about the psychological structuring of vocabulary in an individual and offer a way of investigating the syntactic and semantic relationships among words.” McCarthy (1990), on the other hand, warned that although he saw the merit in WATs, their game-like nature should not be confused with the actual process responsible for retrieving words from the lexicon. Meara (2009, p. 16) contends that WATs are not simply games or “academic curiosities”, but instead they provide valuable information as to the structure of the mental lexicon and how words are stored. No matter on what side of the debate one stands, the weaknesses associated with WATs need to be acknowledged.

All too often, high frequency words are selected as stimuli in study after study. This unsurprisingly leads to very boring and predictable associations produced by participants. In past studies, the stimulus words were chosen from the Kent-Rosanoff (K-R) list (1910). Not only is this list 100 years old, it was also never intended to be used for linguistic research at all. The *raison d’être* of the K-R list was to determine “a benchmark of sanity” (Fitzpatrick, 2007, p. 321). In addition, most of the 100 words on the list are nouns and adjectives, and as Deese (1962) and others contend, these stimuli almost always elicit responses from the same word class.

From the beginning, researchers institutionalized a trinity of response classifications: syntagmatic, paradigmatic, and clang associations. Syntagmatic associations were identified if the response formed a syntactical string with the stimulus word, meaning both words were from different grammatical form classes (e.g. *ball* → *catch*; *run* → *fast*; *paper* → *edit*). Paradigmatic associations were recognized if the response and stimulus word were from the same word class (e.g. *bus* → *train*; *black* → *white*;

*house* → *apartment*). Clang associations were considered to be void of any clear meaningful link, and were based on similarities in phonology or orthography (e.g. *phone* → *foam*; *knife* → *knight*; *acquire* → *choir*).

Early studies into the responses of native speaker (NS) children on WATs (Ervin, 1961; Palermo, 1971) found that as children aged, they produced more paradigmatic responses, and less syntagmatic and clang associations. When these findings were imported to SLA, it led some researchers (Politzer, 1978) to believe that as L2 learners’ proficiency levels increased they would also provide more paradigmatic responses, whereas weaker learners would produce syntagmatic responses, or clang responses. The phenomenon of producing more paradigmatic responses with age or increased proficiency is most commonly referred to as the *syntagmatic-paradigmatic shift*, effectively placing higher value on paradigmatic associations.

There was strong support for the syntagmatic-paradigmatic shift and so the hypothesis lasted, unchallenged, for decades (Wolter, 2001). However, recent studies questioned whether this clear-cut division between L1 and L2 lexicons was actually so prominent. They found with lesser-known words, NS and nonnative speaker (NNS) associations started to become more similar in the proportions of paradigmatic, syntagmatic, and clang responses produced (Wolter, 2001; Fitzpatrick, 2006; Zareva, 2007). This seems to indicate that the actual organization of the mental lexicon may not in fact be that different. It is the “depth of word knowledge” (Wolter, 2001) or “word familiarity” (Zareva, 2007) that truly influences both NS and NNS associations. Wolter (2006) also suggests that the real difference exists between syntagmatic associations (e.g. collocations) rather than paradigmatic associations, as “the process of building syntagmatic connections between words in an L2 appears to be considerably harder than the process of building paradigmatic connections” (p. 746), and thus requires significant lexical restructuring.

## Classification of word association responses

When response classifications are discussed, it is essential that the definitions, which the researchers are using to define what constitutes a paradigmatic response, for example, be clearly stated. The basic definitions were shared among early studies, yet they gradually changed over time as many researchers found the original guidelines inadequate to label their own data. Originally, paradigmatic responses were stringently defined as being from the same word class, syntagmatic responses were from different word classes, and clang responses only bore phonological similarities to the stimuli. Some studies also included a *nil* category to handle unclassifiable responses.

Other researchers suggested that just because a certain stimulus-response pair was from the same word class it should not be excluded from the syntagmatic category, if it was also commonly seen together in a collocation or set phrase (Bandera et al., 1991; Hirsh & Tree, 2001). This led some researchers to enhance the traditional classification system and adopt a more varied approach to classifying syntagmatic responses (Emerson & Gekoski, 1976; Bandera et al., 1991). The new classification systems most often added a new category or split an existing one. However, Fitzpatrick (2006) came up with a much more in-depth measure based on Nation's "word knowledge" classification system (2001, p. 27). Although the categorization process is slightly more laborious, the outcomes are richer, more detailed, and more representative of the actual mental lexicon being examined (see Appendix 1 for a full description of Fitzpatrick's categories).

## Retrospective interviews

Although categorizing WAT responses is not perfect, as there will undoubtedly be some misclassification or perhaps wasted responses being tossed into the *nil* box, Fitzpatrick (2006) sug-

gests that this need not be the case. If post-test interviews are conducted with each participant, the true mental connections can be captured and nothing is wasted. Meara (1983) also made a similar assertion about the importance of participant input to clarify some of the more ambiguous responses. This is ideal in theory, but far from practical.

Although Fitzpatrick (2006) acknowledges that it is a time consuming process, she advises that it is necessary and the best way to accurately categorize responses. Inarguably, it would solve one of the many conundrums that face researchers when analyzing the abundance of word association data that they have obtained: it would clearly help in such obscure associations like *shoe* for *cloud*, discovering that the participant's daughter has clouds on her shoes.

Even if the interview process can somewhat demystify our understanding of the data, another problem crops up in terms of time, specifically time between WAT and the post-test interview. Usually WATs are administered to individuals in group settings (i.e. intact classes), with anywhere between 10 and 100 participants. To get the most reliable interview data, one would presumably want to conduct the interviews as soon as possible. But how soon is reasonable? Asking participants to wait another 30 minutes or one hour is problematic, but aside from the obvious inconvenience to participants, the time between WAT and post-test interview would surely cloud already fuzzy associations. Even if the WAT was administered to one person, one-on-one, depending on the number of stimuli, the participant would have to recall the reason behind an association provided some 10 or 15 minutes before.

A second, more pressing concern involves the validity of the interview data. The reasons provided during a post-test interview will undoubtedly differ from the actual cognitive processes responsible for the response being uttered because the participant initially responds with the first word that came to mind,

whereas in the post-test interview the participant attempts to remember what connection prompted the first spontaneous response. There is established theory from social psychology that supports this concern. Evidence that questions the ability of individuals to describe their cognitive processes comes from the literature on cognitive dissonance and internal attribution theory (Nisbett & Wilson, 1977). The theories put forth the idea that individuals respond to a stimulus first, without much conscious thought, and after the fact, construct opinions or reasons as to *why*, essentially without regard to the initial thought processes involved.

The current study does not attempt to review the psychological literature; however, it is important to acknowledge past findings in psychology and how they may affect studies using retrospective interviews in linguistics. The study instead questions the reliability of participants when offering reasons for their responses on a WAT. The study is described in the following section.

### The study

In order to investigate the effectiveness of retrospective interviews, a small-scale research study was carried out. The study consisted of a WAT, which included fifty words (see Appendix 2 for the complete list of words) selected randomly from the Academic Word List (AWL) (Coxhead, 2000). A sampling of 15 students from a private English conversation school (*eikaiwa* in Japanese), 13 women and 2 men, aged between 38 and 59, were tested and interviewed individually. Based on my best judgment, eight students were considered to be “intermediate” and seven were deemed “advanced”. Students were provided with stimulus words orally, and asked to respond orally. They were instructed to give the reason behind their responses immediately following each stimulus-response pair (i.e. the concurrent interview).

Although the concurrent interviews have not yet been discussed, an important issue needs to be addressed before proceeding to the results, namely the impact student reports have on subsequent responses. When asking participants for immediate explanations for their responses, they may soon realize how difficult it is to provide such an explanation and for each subsequent response, knowing that they will be asked again to give an explanation, there is a chance that they may select a response with an easier explanation. Although this is a legitimate concern, it appears from the data that participants did not select the same type of easily explained responses and in fact, often had difficulty articulating the reasons behind their responses.

Upon completion of the WAT, students were provided with the stimulus-response pair orally and asked again for the reason behind their response (i.e. the retrospective interview). The interviews lasted anywhere from just under 14 minutes to about 37 minutes (both extremes were from intermediate students). On average, each session was just over 20 minutes (intermediate students averaged 20 minutes and 43 seconds; advanced students averaged 22 minutes and 20 seconds). Interviews were recorded for later analysis.

### Results

Of the 750 possible responses (15 people X 50 stimulus words), students provided 612 responses (81.60%). One month after the last WAT was completed, the responses were categorized by the researcher, and then by a colleague, without referring to the recorded interview data for assistance. After some discussion and compromise, it was concluded that 43 responses (7% of the total) should be categorized as having “no link”, and falling under the broader “erratic association” label, as there were no apparent reasons connecting them to the stimulus words. For example, one student responded with *Colorado* to the stimulus word *acquire*. Without elucidation, in the form of the concur-

rent interview, it would have been impossible to know that the student had mistaken *acquire* with the phonetically similar *choir* and connected it with a high school choir from Colorado that had visited her town the previous year.

After analyzing the concurrent interview data to verify the accuracy of our classifications, it was determined that 593 responses were properly positioned in the original categories in which they were placed, as the participants' reasons did not change the classifications. Consequently, only 19 responses (3% of the total) were placed into different categories based on justifiable connections revealed through the interviews (e.g. the response *Colorado* was changed from "no link" to "similar form association"). Although researchers would like to have the highest number of responses as possible, conducting lengthy interviews to save 3% of the responses from being "misclassified" does not seem justifiable. In effect, the concurrent interviews saved only 19 responses from the *nil* bin.

In order to observe if students maintained consistency from one interview to the next, the reasons given during the concurrent in-

terviews were compared to those offered during the retrospective interviews. Of the 612 actual responses, students changed their reasons, enough to place the responses in different categories, 60 times (11.11% for intermediate students; 8.64% for advanced). It is important to note that individuals varied in the number of inconsistencies produced, with two students (one intermediate and one advanced) not changing any reasons between interviews, and two others, one intermediate and one advanced, changing as many as eight and nine reasons respectively. Intermediate students averaged 36 responses and 4 inconsistencies per person. Advanced students averaged 46 responses and 4 inconsistencies per person. The findings bring into question the reliability of individuals to effectively convey their true reasons behind WAT responses, and as a result, the reliability of retrospective interviews. Some representative examples are presented in Table 1.

From Table 1, it is clear that participants often lacked sufficient knowledge of the stimulus words, for example, stating *straight* was the opposite of *illustrate*. However, this is a common occurrence when using low frequency stimulus words, for

Table 1. Examples of changes between interviews

Stimulus word	Response	Concurrent interview	Retrospective interview
survey	question	"A survey has many questions"	"Same meaning"
technology	machine	"Collocation"	"No reason"
nonetheless	still	"Same meaning"	"Same word class"
intervene	interview	"Same meaning"	"Similar pronunciation"
survey	servant	"Same pronunciation"	"Same meaning"
grant	grand	"Same meaning"	"Same pronunciation"
depend	append	"Similar pronunciation"	"Opposites"
illustrate	straight	"Opposites"	"Same pronunciation"
convince	believe	"I don't know"	"Same meaning"
code	numbers	"A code contains numbers"	"Same meaning"



both NNSs and NSs alike (Wolter, 2001), and suggests that less known stimulus words cause participants to produce erratic responses, but does not detract from the fact that participants supplied different reasons for their responses from the concurrent interview to the retrospective interview. The following section will discuss the results further.

## Discussion

In considering the use of retrospective interviews, it appears clear that researchers are faced with a decision that is effectively a trade-off between the number of responses and the accuracy of the responses. According to the data, if there are no interviews, there is a risk of losing or misclassifying less than 5% of the responses. However, with large groups of participants, it may be much more efficient to eliminate the interview stage completely.

Furthermore, if retrospective interviews are used, it is extremely time-consuming for both the researcher and the participant, and about 10% of the reasons given may, in fact, differ from the original reasons. Ignoring the misclassifications, retrospective interviews would help to classify some, in this case 3%, of the idiosyncratic responses.

Interviews may seem intuitively beneficial, but considering the results of this study, their use should be more closely scrutinized. In a one-to-one WAT, the researcher could ask the participant for reasons, if time and patience permitted. However, this should be considered more of an indulgence than a directive. In a large group setting, interviews should not be used at all. Instead, researchers should rely on their own judgments, use other responses for clues, or enlist the help of colleagues.

Depending of course on the stimulus word, many participants do not clearly know why they said what they said, or cannot explain why they said what they said. Wolter (personal communication, 2009) explained some of the apprehensions he had

with respect to retrospective interviews in WATs:

... there's something inherently odd about telling a person to respond with the first thing that comes to mind and also telling them that there are no right or wrong answers, then asking them later why they responded the way they did. In the initial case we're inviting them to be spontaneous and avoid conscious thought processes while in the second case we're asking them to logically explain their spontaneity.

Social psychologists have long challenged the ability of subjects to accurately describe the internal workings of their minds. Miller (as cited in Nisbett & Wilson, 1977, p. 232) claims "it is the *result* of thinking, not the process of thinking, that appears spontaneously in consciousness". As such, participants' revelations about why they responded the way they did to certain stimuli are, at best, approximations of the actual cognitive processes involved.

## Conclusion

This paper attempted to take a critical look at word association research, and approach with caution the assumptions it makes and the theories it has helped create. I am not, however, advocating that the WAT be tossed into a *nil* box somewhere never to be heard from again. The primary point of contention is with the reliability of retrospective interviews and dispelling any notion that one *needs* to conduct retrospective interviews if they use a WAT in their research. A WAT can provide valuable and useful information about the mental lexicon and vocabulary acquisition without an interview stage. Nonetheless, researchers need to remain vigilant when reviewing both new and old studies using WATs as their primary research instruments.

## Bio data

**Christopher Wharton** is the owner of CES English School in Yamagata, Japan. He recently received his MA in TEFL/ TESL at the University of Birmingham and is currently interested in word association tests, L1 use in the L2 classroom, and learner autonomy.

## References

- Aitchison, J. (2003). *Words in the mind* (3rd ed.). Oxford: Blackwell.
- Bandera, L., Della Sala, S., Laiacona, M., Luzzatti, C., & Spinnler, H. (1991). Generative associative naming in dementia of Alzheimer's type. *Neuropsychologia*, 29(4), 291-304.
- Church, K., & Hanks, P. (1990). Word association norms, mutual information, and lexicography. *Computational Linguistics*, 16, 22-29.
- Coxhead, A. (2000). A new academic word list. *TESOL Quarterly*, 34(2), 213-238.
- Deese, J. (1962). Form class and the determinants of association. *Journal of Verbal Learning and Verbal Behavior*, 1(2), 79-84.
- Deese, J. (1965). *The structure of associations in language and thought*. Baltimore: John Hopkins Press.
- Emerson, H., & Gekoski, W. (1976). Interactive and categorical grouping strategies and the syntagmatic-paradigmatic shift. *Child Development*, 47(4), 1116-1121.
- Ervin, S. (1961). Changes with age in the verbal determinants of word-association. *The American Journal of Psychology*, 74(3), 361-372.
- Fay, D., & Cutler, A. (1977). Malapropisms and the structure of the mental lexicon. *Linguistic Inquiry*, 8(3), 505-520.
- Fitzpatrick, T. (2006). Habits and rabbits: Word associations and the L2 lexicon. *EUROSLA Yearbook*, 6, 121-145.
- Fitzpatrick, T. (2007). Word association patterns: Unpacking the assumptions. *International Journal of Applied Linguistics*, 17(3), 319-331.
- Hirsh, K., & Tree, J. (2001). Word association norms for two cohorts of British adults. *Journal of Neurolinguistics*, 14, 1-44.
- Kent, G., & Rosanoff, J. (1910). A study of association in insanity. *American Journal of Insanity*, 67, 37-96 & 317-390.
- Kolers, P. (1962). Interlingual word associations. *Journal of Verbal Learning and Verbal Behavior*, 2(4), 291-300.
- McCarthy, M. (1990). *Vocabulary*. Oxford: Oxford University Press.
- Meara, P. (1983). Word associations in a foreign language: A report on the Birbeck vocabulary project. *Nottingham Linguistic Circular*, 11(2), 29-37.
- Meara, P. (2009). *Connected words: Word associations and second language vocabulary acquisition*. Amsterdam: John Benjamins.
- Moss, H., & Older, L. (1996). *Birbeck word association norms*. Hove: Erlbaum.
- Nation, P. (2001). *Learning vocabulary in another language*. Cambridge: Cambridge University Press.
- Nisbett, R., & Wilson, T. (1977). Telling more than we can know: Verbal reports on mental processes. *Psychological Review*, 84(3), 232-259.
- Palermo, D. (1971). Characteristics of word association responses obtained from children in grades one through four. *Developmental Psychology*, 5(1), 118-123.
- Palermo, D., & Jenkins, J. (1964). *Word association norms*. Minneapolis: University of Minnesota Press.
- Politzer, R. (1978). Paradigmatic and syntagmatic associations of first year French students. In V. Honsa & M. J. Hardman-de-Bautista (Eds.), *Papers in linguistics and child language: Ruth Hirsch Weir memorial volume*. Berlin: Mouton.
- Richards, J. (1976). The role of vocabulary teaching. *TESOL Quarterly*, 10(1), 77-89.
- Schmitt, N. (2000). *Vocabulary in language teaching*. Cambridge: Cambridge University Press.
- Umemoto, T., (1969). *Rensō kijunhyō: Daigakusei 1000 nin no jiyū rensō ni yoru* [Basic association norms: According to free associations of 1,000 university students]. Tokyo: Tokyo Daigaku Shuppankai.
- Wolter, B. (2001). Comparing the L1 and L2 mental lexicon. *Studies in Second Language Acquisition*, 23, 41-69.



Wolter, B. (2002). Assessing proficiency through word associations: Is there still hope? *System*, 30, 315-329.

Wolter, B. (2006). Lexical network structures and L2 vocabulary acquisition: The role of L1 lexical/conceptual knowledge. *Applied Linguistics*, 27(4), 741-747.

Zareva, A. (2007). Structure of the second language mental lexicon: How does it compare to native speakers' lexical organization? *Second Language Research*, 23(2), 123-153.

## Appendix I

### Word association test response categories (x=stimulus; y=response)

#	Category	Subcategory	Definition
1	Meaning-based association	Defining synonym	x means the same as y
2		Specific synonym	x can mean y in some specific contexts
3		Hierarchical/lexical set relationship	x and y are in the same lexical set or are coordinates or have a meronymous or superordinate relationship
4	Position-based association	Quality association	y is a quality of x or x is a quality of y
5		Context association	y gives a conceptual context for x
6		Conceptual association	x and y have some other conceptual link
7		Consecutive xy collocation	y follows x directly, or with only an article between them (includes compounds)
8		Consecutive yx collocation	y precedes x directly, or with only an article between them (includes compounds)
9		Phrasal xy collocation	y follows x in a phrase but with a word (other than an article) or words between them
10	Form-based association	Phrasal yx collocation	y precedes x in a phrase but with a word (other than an article) or words between them
11		Different word class collocation	y collocates with x + affix
12		Derivational affix difference	y is x plus or minus derivational affix
13		Inflectional affix difference	y is x plus or minus inflectional affix
14		Similar form only	y looks or sounds similar to x but has no clear meaning link
15		Similar form association	y is an associate of a word with a similar form to x

#	Category	Subcategory	Definition
16	Erratic association	False cognate	y is related to a false cognate of x in the L1
17		No link	y has no decipherable link to x

From Fitzpatrick (2006, p. 131)

## Appendix 2

### Stimulus words

1	Ethnic	14	Perspective	27	Challenge	39	Practitioner
2	Entity	15	Dimension	28	Media	40	Culture
3	Aware	16	Incline	29	Eliminate	41	Final
4	Technology	17	Assist	30	Illustrate	42	Protocol
5	Odd	18	Consent	31	Survey	43	Undertake
6	Append	19	Link	32	Instruct	44	Denote
7	Ministry	20	Principle	33	Acquire	45	Contemporary
8	Community	21	Albeit	34	Tradition	46	Nonetheless
9	Source	22	Respond	35	Sequence	47	Style
10	Role	23	Convince	36	Paradigm	48	Grant
11	Relax	24	Justify	37	Intervene	49	Code
12	Inhibit	25	Conceive	38	Ratio	50	Exploit
13	Document	26	Framework				