

Co-occurrence of Antonyms in Context* : Research Based on Cobuild CD-Rom Corpus

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Abstract

Antonymy is a special lexical association between word pairs. Charles and Miller (1989) argue, contrary to psycho-linguistic theory, that the primary source of these associations is a tendency they hypothesize for antonyms to co-occur within same sentences. This paper modifies and extends Charles and Miller's co-occurrence hypothesis, which states that antonymous adjectives co-occur in the same sentence with frequencies far greater than predicted by chance and Fellbaum's *Co-occurrence and Antonymy* which extends Charles and Miller's hypothesis to nouns, adjectives and verbs. Our paper extends their hypothesis to all parts of speech.

Justeson and Katz (1991) hypothesize for antonymous to co-occur within the same sentence in discourse. *Big/small* and *large/little* are not synonyms. Our paper discusses their proposal.

In searching the COBUILD CD-ROM for co-occurrence of semantically opposed concepts for any part of speech, we found that words expressing antonymous concepts regardless of any part of speech co-occur within a sentence as well as in a neighboring sentence with higher-than-chance frequencies.

Co-occurrence of antonymy has been hypothesized within a sentence so far by many researchers. But this paper modifies and extends their hypothesis. The relation of co-occurrence of antonymy extends beyond the sentence boundary.

Key words : corpus, antonym, co-occurrence, high frequency, context

1 Introduction

As Farghal (1995 : 20) rightly puts it, 'The linguists have been preoccupied with the structural systems of language—phonology and syntax. This emanates from the fact that they are most susceptible to scientific analysis. The fact remains, however, that without grammar very little can be conveyed, without lexis nothing can be conveyed'. It is only recently that lexis has been a full candidate for serious language research to the linguists.

Computer-assisted research of a large body of data has put the renewed light to the discussion of lexical relations of English language—e.g., synonymy, antonymy, hyponyms, etc. and may be capable of revealing various features of English language which early linguists were not aware of. Many of the linguists suffered from the fact that analysis lacked any formal basis, while the corpora that were used were commonly rather small, privately owned collections of the data, accessible only to few people. Consequently, much of the research that was done then proves impossible to verify is inconsistent, and because of the fact that it was

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carried out on a relatively small scale, it is hardly conclusive about anything. (Nellele Oostdijk, P. 2)

2 Antonym in Literature

Second Witch : When the hurlyburly's done,
 When the battle's *lost* and *won*.

Third Witch : That will be ere the set of sun.

First Witch : Where the place?

Second Witch : Upon the heath.

Third Witch : There to meet with Macbeth.

First Witch : I come, Graymalkin!

Second Witch : Paddock calls.

Third Witch : Anon.

AL : *Fair* is *foul*, and *foul* is *fair* :

 Hover through the fog and filthy air.

(Shakespeare, Macbeth Scene I, Act i)

The opening few lines of *Macbeth* are among one of the most familiar scenes ever written by Shakespeare. This drama begins with pairs of antonyms. The effect of the antonyms is to draw audience to the drama. Here all the pairs of antonyms are treated as if they are synonyms which confuses audience and readers. One could interpret the dialogue of three witches which reflects two conflicting desires of Macbeth and one could attribute the dialogue to a single voice which causes Macbeth to fall into snares of evil. The first word of pairs is effectively cancelled out by the next. One could wonder what *lost* is *won* and *fair* is *foul* and *foul* is *fair* means. The voice evokes the desire of Macbeth. Contradiction and confusion catch Macbeth and also us. Antonyms produce the unique fascination of the drama. Shakespeare manipulates curious and possibly reflective of unique fascination of antonyms.

Jones (2002) argues that a memorable and important piece of literature making extensive use of antonymy can be found at the beginning of the Bible.

In the beginning God created the *heaven* and the *earth*.

And the earth was without *form*, and *void* ; and *darkness* was upon the face of the deep. And the Spirit of God moved upon the face of the waters.

And God said, Let there be *light* : and there was *light*.

And God saw the *light*, that it was good : and God divided the *light* from the *darkness*.

And God called the *light* *Day*, and the *darkness* he called *Night*. And the *evening* and the *morning* were the first day.

(Authorized King James Version, Genesis 1 : 1-5)

The first chapter of Genesis is full of pairs of antonyms. The creation of the universe is explained largely in terms of antonyms. In total, five pairs of antonyms (*heaven/earth, form/void, darkness/light, day/night, evening/morning*) are presented and the first chapter of genesis is replete with antonyms. The sentence features rely on apposition. It is curious that these lines are perhaps one of the best known of all. Without antonyms, the universe was not created. God needs antonyms to create the universe, at least linguistically. One can see many 'opposites' extensively across the Bible.

3 Data

This Collins COBUILD on CD-ROM (HarperCollins Electronic Reference, 1995), which was the basis for the examination of co-occurrence of antonyms, was served as the body of text for CD-ROM searches. This corpus contains five million words of authentic examples of British English usage taken from a wide variety of publications. The Word Bank can only be entered after a search has been performed. As it contains over five million words, there would otherwise be too many examples to browse through. After you have performed a search, click on the Word Bank section button to enter Word Bank.

This compact disc integrates Collins COBUILD English Language Dictionary, Collins COBUILD English Usage, and Collins COBUILD English Grammar, together with a Word Bank containing 5 million words selected from the Collins COBUILD Bank of English corpus.

You do not have to be a computer expert to be able to use COBUILD on CD-ROM. Whether you are a beginner carrying out a straight word search, or an experienced researcher seeking the answer to a query of greater complexity, you will be able to retrieve the information you want swiftly and easily.

4 Antonyms in Context

In our data from COBUILD CD-ROM we found the following co-occurrences of antonyms with neighbouring sentences. They show that antonyms do not always co-occur within a sentence. It is of interest to point out that they occur in a shared context common to a pair of the antonyms.

Unlike Christine Fellbaum's findings for adjectives, nouns and verbs they can co-occur in neighbouring sentences. The co-occurrence of antonyms cannot be confined to the same sentence. It can cross a sentence boundary.

Examples are :

- (1) Now there is relative *peace* in Uganda. The physical wounds may have healed, but the psychological scars of violence have been slow to fade, creating obstacles to people trying to rebuild their communities in the aftermath of *war*. - (ephemera)
- (2) That Lord Robert had died at St Omer - *true*. That the Germans were about to pull out

so as to have more men available for the eastern front - *false*. ? (book)

(3) True, history casts a *long* shadow. The *short* span of 75 years in which Germany was united during its thousand-year existence was not our happiest period nor the happiest period of our neighbours - (newspapers)

(4) I think Portsmouth's run will *come* to an end. Southend, Bristol Rovers and Sunderland will *go* down and I've got my fingers crossed for us.' - (magazine)

(5) The *father* remarried in 1988. In 1989, the *mother*, who had been employed as a prison officer, formed a lesbian relationship with a prisoner released after serving a sentence for unlawful wounding and theft. - (newspaper)

(6) '*Bad* timing, huh? He shrugs. 'But if people are gonna speculate on who I fuckin' hang out with, it is never gonna be *good* timing. - (magazine)

(7) ...the problem of *failure*. It's not considered as much fun as *success*, but seems to arrive more frequently ...- (book)

5 The Data Analysis

Table 1. *Man/woman* and *men/women*

| Words | | Individual | Occurrence | Co-occurrence | | |
|-------|-------|------------|------------|---------------|----------|--------|
| w1 | w2 | n1 | n2 | actual | expected | ratio |
| man | woman | 3,011 | 1,234 | 106 | 37.156 | 2.853 |
| men | women | 2,051 | 1,870 | 388 | 38.353 | 10.165 |

Examples are : (8)

Now I love being tall. The classic image of the Garboesque *woman* clinging to a taller *man* is gradually being broken down. - (magazine)

(9) Isn't it curious how most *men* consider most *women* to be lousy drivers, and yet *women* have far fewer accidents than *men*? - (magazine)

Table 2. *Boy/girl* and *boys/girls*

| Words | | Individual | Occurrence | Co-occurrence | | |
|-------|-------|------------|------------|---------------|----------|--------|
| w1 | w2 | n1 | n2 | actual | expected | ratio |
| boy | girl | 616 | 677 | 35 | 4.170 | 8.393 |
| boys | girls | 375 | 382 | 46 | 1.433 | 32.100 |

(10) in love with a *boy* of her own age, the *girl* decides to increase her allure and stature by weaving a wonderful fiction around her dad, pretending he is actually her lover who, for good measure, has a serious illness and is being hunted by the police. - (ephemera)

(11) Vincent Ward's Map of the Human Heart is a love story between an Eskimo *boy* (Jason Scott Lee) and a Cree Indian *girl* (Anne Parillaud) who meet in a Canadian tuberculosis hospital but then become separated. - (magazine)

(12) Young *girls* are sold as concubines, *boys* are bought by businessmen to work in township liquor stores in return for food and clothing, and labourers work for starvation wages for white farmers.- (ephemera)

(13) Nearly a half of *girls* and a third of *boys* now claim to have had intercourse before they reached 16 ; this contrasts with two per cent of girls and six per cent of boys in 1964. - (magazine)

Table 3. *Teacher(s)/student(s), employee(s)/employer(s)/employee(s), doctor(s)/patient(s) and day*/night**

| Words | | Individual | Occurrence | Co-occurrence | | |
|-------------|-------------|------------|------------|---------------|----------|--------|
| w1 | w2 | n1 | n2 | actual | expected | ratio |
| teacher(s) | student(s) | 519 | 1,963 | 44 | 10.188 | 4.234 |
| employer(s) | employee(s) | 274 | 176 | 6 | 0.48 | 12.500 |
| doctor(s) | patient(s) | 680 | 545 | 60 | 3.706 | 16.190 |
| day* | night* | 5,371 | 2,673 | 157 | 143.567 | 1.094 |

The wild character (*) is used at the end of a word or partial word to indicate that any word which begin with the characters before (*)

Examples are :

(14) A result of these differences is that a majority of British and Irish *students* finding work in Europe immediately after graduation are either *teachers* of English, or have a degree in a field such as engineering, which is directly related to the needs of the employer. - (ephemera)

(15) It has a range of specialist facilities. There are Primary and Early Years Teaching Centres, where staff and *students* work with *teachers* and children from local schools. - (ephemera)

(16) By December 1992, all *employers* will be responsible for guarding their *employees* health including eyes! - (ephemera)

(17) For those with continuing domestic commitments work overseas can be an expensive proposition both for *employer* and *employee*. - (ephemera)

(18) Some *doctors* give counselling to *patients* who have the virus. - (ephemera)

(19) Teenagers need to be firmly reassured that *doctors* will respect their confidentiality, just as they would that of any other *patient*. - (magazine)

(20) We look forward to meeting you! Almost all branches can be telephoned day or *night*, 7 days a week including Bank Holidays, and can be visited any *day* or evening. - (ephemera)

The two antonymous nouns, *day and night*, in a sentence sometimes have different in number or they may be part of different compound nouns.

(21) Normal office hours are 0900-1700, but we also have an out-of-hours answering service which you can ring at any time of the *day* or *night*. - (ephemera)

Table 1, 2 and 3 show the co-occurrence data for the antonymous noun to noun pairs. In each case, the number of actual co-occurrence is much higher than would be expected if these

antonymous nouns were being used independently. These data clearly support the high frequency of the co-occurrence of antonymous nouns

Table 4 *War/peace* and *life/death*

| Words | | Individual Occurrence | | Co-occurrence | | |
|-------|-------|-----------------------|-----|---------------|----------|-------|
| w1 | w2 | n1 | n2 | actual | expected | ratio |
| war | peace | 1,231 | 354 | 21 | 4.358 | 4.819 |
| life | death | 2,916 | 951 | 64 | 27.731 | 2.308 |

Examples are :

(22) Applications are therefore especially welcome from those who wish to pursue research degrees in the Centre's main areas of interest, particularly philosophy of medicine, including medial and nursing ethics ; reproductive technology and genetic engineering ; environmental philosophy and ethics, including population ethics and the treatment of animals ; international relations, including *war* and *peace*, global justice, underdevelopment and other Third World issues. - (ephemera)

(23) *War* clouds were gathering over the Middle East, he added, and while Israel was working towards *peace*, it could not determine the final course of events. - (newspaper)

(24) My thoughts on *life* and *death*... Although I am not a very church-going sort of person, I really am one for accepting that this is where we are and you've got to make the most of it. - (magazine)

(25) In the Magic Mountain, Thomas Man wrote that all interest in disease and *death* is only another expression of interest in *life*. - (magazine)

(26) I don't think it overshadowed my *life* particularly ; I didn't think it was likely that I would die, but I just was always aware that *death* could happen to anyone at any moment. And the huge finality of it, really. - (magazine)

Next, co-occurrence of adjective antonym pairs were searched for. Like in the previous noun antonym pairs, the frequency of occurrence of semantic opposition pairs is much higher than expected number of sentences if these antonymous adjectives were being used independently.

Justeson and Katz (1991) propose to resolve the problem of the definition by referring antonymy as a lexical relation. Antonymy is specific to words rather than concepts. They cite the scale of size as evidence, arguing the that although *small* and *little* are synonymous and *big* and *large* are also synonymous, most native speakers of English would be intuitively aware that the more appropriate antonymous pairs *large/small* and *big/little*. *Big/little* and *large/small* are good antonym pairs but *big/small* and *large/little* are not antonym pairs. Antonymy is a special lexical association between word pairs. That it is lexical and not simply semantic follows from the fact that different words for the same concept can have different antonyms.

Table 5 Antonymous pairs for adjective

| Words | | Individual | Occurrence | Co-occurrence | | |
|--------|--------|------------|------------|---------------|----------|--------|
| w1 | w2 | n1 | n2 | actual | expected | ratio |
| big | small | 1,537 | 2,018 | 40 | 31.016 | 1.290 |
| big | little | 1,537 | 2,896 | 30 | 44.511 | 0.674 |
| large | small | 1,415 | 2,018 | 70 | 28.554 | 2.451 |
| large | little | 1,415 | 2,896 | 14 | 40.978 | 0.341 |
| high | low | 1,848 | 649 | 52 | 38.353 | 1.356 |
| rich | poor | 373 | 590 | 30 | 2.201 | 13.630 |
| tall | short | 308 | 1,045 | 8 | 3.219 | 2.485 |
| hot | cold | 506 | 603 | 26 | 3.052 | 8.519 |
| good | bad | 3,887 | 783 | 73 | 30.403 | 2.401 |
| long | short | 2,809 | 1,045 | 57 | 29.354 | 1.942 |
| strong | weak | 807 | 163 | 16 | 1.315 | 12.214 |
| black | white | 1,333 | 1,548 | 192 | 20.635 | 9.305 |
| true | false | 697 | 156 | 7 | 1.087 | 6.440 |
| wet | dry | 206 | 380 | 13 | 0.783 | 16.603 |

Our paper partly supports their hypothesis and partly denies it. According to our statistics, *large/small* are antonymous but our statistics denies that *big/little* (occurrence ratio 0.674) are antonymous but rather it seems to confirm that *big/small* (occurrence ratio 1.290) are antonyms even though occurrence rate is not high. Our statistics shows that *large/small* and *big/small* are antonymous. Our proposal is tentative and much closer investigation is needed for explanation.

Examples are :

(27) Trust Estate Teams help local farmers in many areas with hundreds of vital jobs, *big* and *small*, ranging from fencing repairs to stile building, from tree planting to culvert clearing for erosion prevention. - (ephemera)

(28) The perennial Henley favourites-the Trinity College Swing Band return again under Bobby Lamb to play jazz from the *big* band area for everyone to listen and dance to until the *small* hours. you just can stand still! - (ephemera)

(29) WILLINGSHURST. *Big* bags of *small* carp to most methods. - (magazine)

(30) Should you have any special requests such as adjoining rooms, *high* or *low* floor, make your request on your booking form. - (ephemera)

(31) As individuals we have *little* control over *big* industries, but unions could help by finding out the facts and ensuring that they do not demand safety tests which are not absolutely necessary. - (ephemera)

- (32) My aim was to come back with a *little* silver horse for being in the top twelve and I really didn't expect to come away with the *big* one. - (magazine)
- (33) There is *little* slipstream buffet despite the *big*, open cockpits, and the high seats give a good view past the ego-boosting sight of bright yellow wings adorned with pre-war, red-white-and-blue Army star roundels. - (magazine)
- (34) Within 15 minutes he had made a hole *big* enough to pop his beautiful *little* head through much to the surprise of our daughter who was carefully holding the box. - (magazine)
- (35) Over the last year our newspapers have reported on many impressive initiatives which have taken place in businesses *large* and *small*. - (ephemera)
- (36) There are about 400 members of the Stock Exchange, who range from *large* securities houses with hundreds of staff to *small* firms with only a few. - (ephemera)
- (37) Craig, coming from a *large* city, found life at a *small* rural campus institution not to his liking. - (ephemera)
- (38) One of the main attractions of working in the Middle East is the very *high* rate of pay, coupled with *low* or even non-existent income tax. - (ephemera)
- (39) The company is designed to be responsive to student needs and to provide *high* quality services at relatively *low* cost. - (ephemera)
- (40) As they close down all the *little* factories and build one *large* factory in the Midlands they say, oh well I can distribute all my goods by the motorway system, what's the problem? - (ephemera)
- (41) On a *large* tree they would have *little* adverse effect. - (magazine)
- (42) He watched his father Jack Panos (Panayiotou was a *little* unwieldy) work his way up from waiter to restaurant owner, and saw his family move from a flat in the backstreets of London to a *large* house in Hertfordshire. - (magazine)
- (43) Encourage your children to play together. As long as the age gap between them is not too *large*, they will probably play together for a *little* while each day—the more they are in each other's company, the less likely they are to be jealous. - (magazine)
- (44) it was *little* more than a few fleshy roots and about six leaves that looked like *large* blades of grass. - (magazine)
- (45) The development economics course starts with a consideration of *rich* and *poor* countries and examines development strategies, objectives and problems. - (ephemera)
- (46) As Russia staggers towards a Latin American-style market economy, the gap between *rich* and *poor* gets bigger every day. - (magazine)

For multiple occurrences of two concepts (*hot/cold* and *alcoholic/non-alcoholic*), the expected number of co-occurrence, the ration of actual to expected co-occurrence and the chance probability are extremely low. But the actual occurrence of these is far higher than expected.

- (47) Extremes of *hot* or *cold* temperatures for long periods should be avoided. - (magazine)

- (48) Although *wet* conditions may well return, Badminton badly needed this *dry* week to re-establish its credibility. - (magazine)
- (49) After a *wet* Saturday, Sunday dawned dark but cleared as the day went on, to give the later starters *dry* roads and blue sky. - (magazine)
- (50) Otherwise, he said, when the time comes the people will not be making distinctions between activists and quietists, *good* Mullahs and *bad*. They will burn the *wet* with the *dry*. - (newspaper)

Table 6 Antonymous pairs for verb

| Words | | Individual n1 | Occurrence n2 | Co-occurrence | | |
|----------|-----------|------------------|------------------|---------------|----------|---------|
| w1 | w2 | | | actual | expected | ratio |
| teach | learn | 138 | 381 | 4 | 0.526 | 7.605 |
| win | lose | 28 | 400 | 19 | 0.112 | 169.643 |
| buy | sell | 690 | 624 | 21 | 4.306 | 4.877 |
| lived | died | 418 | 680 | 11 | 2.842 | 3.871 |
| lengthen | shorten | 10 | 10 | 1 | 0.001 | 1.000 |
| appear | disappear | 478 | 78 | 3 | 0.373 | 8.043 |
| loved | hated | 207 | 87 | 2 | 0.180 | 11.111 |
| pushed | pulled | 299 | 489 | 6 | 1.462 | 4.104 |

Examples are :

- (51) You are recommended to *learn* to drive with an Approved Driving Instructor (ADI), who has to be registered with the department of Transport and is the only person allowed to *teach* driving for money. - (ephemera)
- (52) 'It was very hard work, but brilliant, 'she says.' 'You don't just *learn* the basics of how to *teach* English, but you also get practice teaching foreigners at the school.' - (newspaper)
- (53) And even then it's like Groucho Marx saying he didn't want to belong to any club that would have him as a member, if I joined the Rights, they'd be demoted into the Second Division and thence into the Wrongs in less time than it takes to *shorten* a hairstyle and *lengthen* a skirt. - (magazine)
- (54) He says that, *win* or *lose*, he will never record another note for Sony. - (magazine)
- (55) I believe one of the main reasons we *lose* so many novice Border fanciers is because they

Table 7 Antonymous pairs for pronoun

| Words | | Individual n1 | Occurrence n2 | Co-occurrence | | |
|-------|-----|------------------|------------------|---------------|----------|-------|
| w1 | w2 | | | actual | expected | ratio |
| he | she | 5,861 | 6,000 | 1,348 | 351.66 | 3.833 |

- are too keen to *win*, too quickly. - (magazine) (110) Worldwide, we handle several thousand *buy* and *sell* transactions daily on the primary and secondary markets. - (ephemera)
- (56) Traders *sell* and *buy* futures to 'hedge' or cover their physical transactions. - (ephemera)
- (57) *He/she* may suggest that you go to the doctor for further help. - (ephemera)
- (58) But just because somebody gets HIV virus, it doesn't automatically follow that *he* or *she* will get AIDS. - (ephemera)
- (59) *He* was in an extremely malnourished condition" *she* said. - (ephemera)
- (60) A week later his girlfriend walked out on him. *He* phoned her at her sister's and threatened to kill the rest of the puppies if *she* didn't come back. - (ephemera)
- (61) *She* refused ; so *he* fetched his hammer again. On the kitchen step, one by one, *he* beat the puppies • brains out. - (ephemera)

Table 8 Antonymous pairs for Adverb and Preposition

| Words | | Individual | Occurrence | Co-occurrence | | |
|---------|-----------|------------|------------|---------------|----------|--------|
| w1 | w2 | n1 | n2 | actual | expected | ratio |
| up | down | 5,728 | 478 | 459 | 27 | 17.000 |
| here | there | 2,714 | 4,781 | 290 | 129.756 | 2.235 |
| inside | outside | 821 | 1,056 | 46 | 8.670 | 5.306 |
| more | less | 6,103 | 1,594 | 308 | 97.282 | 3.166 |
| happily | unhappily | 88 | 9 | 1 | 0.008 | 125 |
| in | out | 6,000 | 5,563 | 3,418 | 333.78 | 10.240 |
| on | off | 4,692 | 3,847 | 748 | 180.501 | 4.144 |
| below | above | 716 | 1,093 | 41 | 7.826 | 5.241 |
| with | without | 6,000 | 2,131 | 278 | 127.86 | 2.174 |

Table 8 contains the co-occurrence data for different word groups. The data clearly show that the phenomenon of high co-occurrence of antonymously related words is not confined to nouns, adjectives, verbs and pronouns. This finding argues against Fellum's assumption (p. 289) that her lack of adverb-adverb co-occurrence can probably be attributed to the relative infrequency of adverbs. Fellbaum's absence of preposition-preposition co-occurrence can probably be attributed to the small size of her corpus; She used one million word Brown Corpus. It may be remarkable for her if she used Cobuild CD-ROM. Many of lexically distinct pairs of adverbs were found to co-occur.

Examples are :

- (62) We expect to be able to run, hop, skip and jump at will, to walk *up* and *down* hills and over many different surfaces. - (ephemera)
- (63) For Shelter, the increase in mortgage arrears has been felt most in our Housing Aid Centres in towns *up* and *down* the country. - (ephemera)

- (64) Futures tick *up* and *down*. The traders' eyes are glued to the screen, like soldiers in a dug-out, poised to go over the top. - (ephemera)
- (65) If we are not *there* please leave a message on our answerphone We are *here* to give you support and help, to provide you with information, to answer your letters and to listen to you when you phone us - all in confidence. - (ephemera)
- (66) We spend two nights *here* in the very capital of the region, Reims and *there* will be plenty of time to visit its ancient Gothic Cathedral and Palais du Tau as well as those vineyards and a champagne cellar for a tour and a tasting. - (ephemera)
- (67) When someone is infected with HIV his count drops *quickly* to around 600 (and then *slowly* thereafter). - (newspaper)
- (68) sometimes so *slowly* that you can't notice just by looking, sometimes so *quickly* that only a fast shutter speed can capture it. - (book)
- (69) She'd regained control of herself and we walked, *slowly* at first, then more *quickly* to the darkened glass doors. - (book)
- (70) A golfer who knows that his opponent likes to play *slowly*, at a measured pace, might play at breakneck speed in order to put pressure on his opponent to play more *quickly* than he/she wants to. - (book)
- (71) If you have chosen the more restricted Defined Perils cover on Contents, individual items can be insured against All Risks both *on* and *off* the Premises. - (ephemera)
- (72) Obviously there are things that could and should be done before one sets *off* and *on* one's travels. - (magazine)
- (73) She can barely manage *with* or *without* boundaries. She is worn out with battling. - (newspaper)
- (74) We concur *with* those who point out that the unilateral action of the US was completely unjustified, and that America acted *without* a mandate. - (newspaper)

6 Conclusion

Evidence from Cobuild CD-ROM shows that antonymous words with any word class in the same context co-occur with much higher-than-chance frequencies. The data examined in this paper strengthen Christiane Fellbaum's co-occurrence hypothesis of antonyms (1995) and extend it beyond the word classes of adjectives, nouns and verbs, showing that semantically opposed concepts of all the other word classes like pronouns, prepositions and adverbs co-occur.

Our paper shows that *big/small* and *large/small* are antonyms which argue partly against and partly for Justeson and Katz. Our proposal is tentative and further research is needed for clearer explanation. The tendency which Charles and Miller (1989) hypothesize for antonyms to co-occur within the same sentence, which Justgeson and Kaz (1991) support must be modified. The result of this study shows that co-occurrence of semantically opposed words occurs crossing a sentence boundary. The hypothesis of co-occurrence of antonyms is not

confined within a sentence. The relation of antonyms crosses the sentence boundary. We propose that co-occurrence of antonymy takes place in context. Context crosses a sentence boundary. Our research also shows that co-occurrence of antonyms does not confined to any word class. We propose the hypothesis that co-occurrence of antonyms occurs to any word class and goes beyond a sentence.

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* I modify the paper presented to The Linguistic Association of Finland on 17th, Nov. 2004 at Symposium at Turku University, Finland as a Research Note. It is an update of 'Co-occurrence of Antonyms' written by Yoshio Narisawa and Masaaki Machiya in 1999.

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