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A Corpus-based Linguistic Analysis on Spoken Corpus: Semantic Prosodies on "Robots"

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Abstract

This study focuses on the semantic prosodies of the word "robot" from words that colligates it in data of the spoken form. The data is collected from a lecturer's talk discussing two topics which are about man and machines in perfect harmony and the effective temperature of workplaces. For annotation, UCREL CLAWS5 Tagset is used, with Tagset C5 to select output style of horizontal. The design of corpus used is by ICE. It reveals that more positive semantic prosodies on the word "robot" are presented in the data compared to negative, with 52 occurrences discovered for positive (94,5%) and 3 occurrences discovered for negative (5,5%). Words mostly collocated with "robot" in the data are *service* with 8 collocations, *machines* with 20 collocations, *surgical system* with 15 collocations and *intelligence* with 13 collocations.

Keywords: semantic prosodies, "robot," colligation, annotation, UCREL CLAWS5 Tagset, ICE

1. Introduction

Semantic prosody was first described by Sinclair in 1987. Louw (1993, p. 157) defined the terms as a consistent aura of meaning with which a form is imbued by its collocates (see also Sinclair, 1991, pp. 74-75). It simply means that words have typical collocates. Prosody is often described as how words can be identified with positive or negative relations in the course of frequent occurrences with specific collocations. For example, example Sinclair (1987) revealed that the subjects of the phrasal verb 'set in' are constantly unlikeable things such as the phrase "*rigor mortis* had set in" (in Wynne, 2005).

Through the use of corpus linguistics and concordance software (see Yusuf, p. 109), semantic prosody is used as an indispensable method in evaluative text and connotations. The software is capable of arranging key words chosen in the context from a corpus of million words of naturally-occurring text. For language teachers and students of linguistics, now several large corpora and many more are freely accessible from Mark Davies' website (http://corpus.byu.edu) and Adam Kilgarriff's Sketch Engine (http://ca.sketchengine.co.uk/register) (in Chateau, 2010).

Louw (1993) claimed that analyses of the semantic prosodies related to certain words are not commonly reachable by the humans' instinct, they can only be known computationally through its accurate computational methods.

2. Literature Review

Collins English Dictionary (2007) explains that the word 'robot' was first used by the Czech writer Karel Capek (1890 - 1938) in his play *R.U.R.: Rossum's Universal Robots*, published in 1920. In the play, people created manlike machines called robots. The word 'robot' comes from Czech *robota*, meaning 'work, slavery or forced labor' that conveyed negative connotations.

From various dictionaries today, robot is defined as:

1. A machine programmed to perform specific tasks in a human manner, especially one with a human shape; a person of machine-like efficiency (Collins English Dictionary, 2007).
2. A machine that can move and do some of the works of a person, and is usually controlled by a computer (Longman Dictionary of Contemporary English, 2005).
3. A machine capable of carrying out a complex series of actions automatically, especially one programmable by a computer (The Compact Oxford English Dictionary of Current English, 2005).

Based on the definitions from the dictionaries above, links to the term leads to more positive denotations. Robots, or automated devices, are useful and even essential as it is believed to benefit the human beings in assistance and service.

Scientists who are cultivating their knowledge on the development of robot technologies are eager to create more advanced robots that are of a better service to the human beings. Some examples of advanced robot machinery are the creations of robots to explore and monitor water quality and the ascending of robotics in the manufacturing and service industry that can perform tasks usually done by humans or

that necessitate something of human intelligence to complete. To these researchers, robots seem to gain constructive benefits to the development of science and technology.

There are also movies produced today on robots that also bear negative and positive connotations of that word for the viewers. "Good robot" movies are such as RoboCop (1987), a story of a police officer who is brought back as a robotic peacekeeper, or the animated Wall-E (2008), presents the qualities of a good robot that can help save mankind. There are also "bad robot" movies involving the story of frightening robotic projects that at the end harm the human beings such as The Matrix (1999), and I, Robot (2004) among many others. As a result, it can be assumed that the word "robot" distinctly has various semantic prosodies towards the viewers.

Therefore, meaning of words are associated by the speakers and hearers not just because of their intrinsic meaning, but also because of the linguistic contexts in which they become habituated to speaking and hearing them; in this way words are *primed* for certain uses and meanings (Wynne, 2005).

Consequently, from the use of the word "robot" in the natural setting, this study would like to observe the perceptions of robots especially from a researcher of the field's, or in this case as the speaker's, point of view. By conducting semantic prosody, this study intends to reveal the positive and negative connotations of "robot" from words that colligate it.

3. Methodology

For this present study, data were of my own gatherings which had been collected from a natural setting of a lecturer's talk in the field of engineering. The data had been transcribed before entered into the computer.

3.1 Scope

As semantic prosody spreads the meaning beyond single word boundaries (Partington 1998, p. 68) and its primary function is to express speaker or writer attitude or evaluation (Louw, 2000, p. 58), this study focuses on the semantic prosodies on the word "robot" from the data collected.

3.2 Aim

Stubbs (1995) explained that words may habitually collocate with other words

from a definable semantic set. As this present study is of the naturally occurring data which had been collected from a lecturer's talk, his illustration and approach towards the implication of robot is hoped to provide a systematic analysis of the target word. The research objectives for this research are:

1. To reveal the semantic prosodies, positive and negative, of the word "robot" from words that colligates it.
2. To observe the common words those are collocated with "robot."

3.3 Source of Corpus

The spoken data was collected from a lecturer from the Faculty of Engineering of University Malaya. These data consisted of two topics; where the first was about man and machines in perfect harmony and the second discussed about the effective temperature of workplaces.

3.4 Types of Corpus

The data for this present study were positioned in formal situations. It was mostly a monologue as it was a formal lecturing. As mentioned earlier, the data were taken from two lecturing of the same lecturer. The first lecture is 100 percent monologue. In the second lecture, there were a few responses from students at the beginning of his lecturing. But they were only short answers and remarks such as "Yes, yes…" uttered together.

The standard markups applied for the corpus was by ICE. Nelson (1995) mentioned that for spoken texts, especially dialogues, more mark-ups are required. They are applied during transcriptions and their scheme is orthographic.

For spoken corpus, to grasp the semantic prosodies of the word "robot" and "robots," the words that collocates them were very important in determining the environment of their connotations. Therefore, these words and the words which surround their setting were annotated. In annotating the two forms of the corpora, words which surround them as 5L (to the left) and 5R (to the right) were taken.

For annotation, the available UCREL CLAWS5 Tagset in the Internet was used. The free CLAWS WWW trial service is accessible from the website http://www.comp.lancs.ac.uk/ucrel/claws/trial.html. Tagset C5 was used with selected output style of horizontal.

3.5 Size of Corpus

The design used for this study is by ICE. For this design, each file must contain 2, 000 words but not less. In corpus planning, the file must be of similar size. For this study, 10, 000 words were collected for each form of data. Then each form of data were divided into 5 files with each file consisting of 2, 000 words.

For spoken data, the first three files was the lecture on the first topic which was man and machines in perfect harmony and abbreviated into MMPH. Subsequently, the last two files were a lecture about the effective temperature of workplaces and abbreviated into ETW. For the names of the corpus, the abbreviation of the topics of the lecture at the end were tagged to validate with the data. The names of the files for spoken corpus are:

1. **S1B-001 (MMPH)**
2. **S1B-002 (MMPH)**
3. **S1B-003 (MMPH)**
4. **S1B-004 ETW**
5. **S1B-005 ETW**

3.6 Time Period of Corpus

The data were collected over two periods of time. The first lecture was collected during the Showcase International Dialogue Langkawi 2004. It was about man and machine in perfect harmony. The second lecturewas collected from a class lecturing held in one of the lecture room in the Faculty of Engineering, University Malaya, which discussed about the effective temperature of workplaces.

A JVC video camera was used for recording. Then the video was put into the computer into the program Windows Media Player to achieve a clearer sound and easier arrangement for transcribing.

The first lecture was recorded for 48 minutes and 49 seconds; thus the transcription was only for 40 minutes and 57 seconds, starting at 8 minutes 2 seconds until the end. The second lecture was recorded for 51 minutes and 35 seconds; the transcription was only for 29 minutes and 04 seconds, starting at 1 minute and 12 seconds. The purpose was to cover only the 10, 000 words for each corpus.

3.7 Programs for Corpus

WordSmith Tools program was used for this study. In carrying out the

investigation of corpora, the most used analytical tools from the program were wordlist and concordance. From wordlist, the words from most to least which appeared in the data were revealed. From there, words of interest were chosen for analysis on semantic prosody. The word "robot" and "robots" were selected as both lectures focused intensely on its creation and development. By using the concordance analytical tool, the words or phrases that collocates the particular words were observed for analysis.

4. Data Analysis

By using the Wordsmith Program, the frequency of words in Wordlist from the five files of the spoken corpus as an overall is 1, 456 of types and 10, 342 of tokens, with the type/token ratio of 14, 08.

From the compiled corpus, out of 1, 456 of words which the lecturer had used, the most frequent word to occur in his speech is "the", with 637 occurrences. In spite of articles, discourse markers, pronouns, conjunctions, modals, prepositions, determiners, verbs and auxiliary verbs, a good number of nouns to appear are "temperature" (46 concordances), "system" (45 concordances) and "heat" (43 concordances). Thus the words "robot" (38 concordances) and "robots" (27 concordances) were the most to appear and were discussed in 2/3 of the corpus. Therefore they are chosen for analysis of the semantic prosodies. They were also words of interest because robots today have become more advanced, sophisticated and used by the human beings to perform various tasks.

Based on the robots definitions provided earlier in the literature section, the definition that suits best for the word "robot" in this study is as "a person of machine-like efficiency."

The lecturer sometimes did not differentiate the use of singular or plural form of "robot." It is assumed this might be due to situations where speech requires effective speed and articulation. These two words were considered as one term. Therefore 65 concordances of "robot" were located.

In the first three files, the lecture was mostly about the functions and development of robots, especially in Malaysia. In analyzing the meanings which surround the word "robot," collocations of words, particularly part-of-speech, were examined. A total of 10 words that described various semantic prosodies were identified. From these, some phrases were extracted from the concordances for

illustration of the meanings.

4.1 Positive Semantic Prosodies on "robot"

There were 4 instances of positive semantic prosodies found on "robot" in the spoken corpus. From the collocations of part-of-speech tied with the word "robot", several meanings were revealed. They are explained as the following.

1. The ability/ functions of robots

This prosody was found 21 times in the lecture. Collocations of words from conjunctions, prepositions, verbs, modals, and verb + NOT with the word "robot" from the data reveal its various ability and functions:

1. Conjunctions: *that is used for service, to handle interaction between the disabled people.* Extraction from the data:
   (1) h so what are the characteristics of a goods of a service robot for a robot *that is used for service* as much as possible it should really the
   (3) w *to handle interaction between the disabled ah person* with ah the robot now that another one that ah I have used is actually simulate i
2. Prepositions: *for a robot that is used for service, at home to be able to handle the cans, in sewing as a useful precision, for inspection of oil lines and oil leaks.* Extraction from the data:
   (30) 's it's very tiring you know so it it therefore the the help of robot *in the sewing will be very useful precision* it it allows p
   (45) city ah bombs and and ah knots and then there's ah underwater robots *for inspection of oil lines for oil leaks* you know repair oil lin
3. Verbs (base and –ing forms): *to grip, control the microscope, memorize using its vision system, have various attributes, to fill in the gas stands, conducting the surgery, picking fruits.* Extraction from the data:
   (22) rates this ah system and when the surgeon is happy with the robot *conducting the surgery* it can be done autonomously or it
   (28) e position to another position so the robot then follow this part the robot *memorize this room by using its vision system* or other senses
4. Modals: *can map out and deal the part to generate, will not move beyond the limit, should have grip strength, will not just fall off, can guide itself, will replace the surgeon, can continue for hours to surgery.* Extraction from

the data:

(9) t ah not fall off right if the hand goes beyond the limits, the robot *will not move beyond that limit* because it has already re

(65) go home and rest and drink and be with the family so the robots *can continue for hours to surgeon to surgery* the hospita

5. Verb + NOT: *does not follow wrong instructions from the surgeon.* Extraction from the data:

(18) n ah if the surgeon does something move his hand there *the robot doesn't follow it* because you can actually set ah a limit

2. The state of robots

This prosody was found 18 times in the lecture. Collocations of words from conjunctions, prepositions and adjectives with the word "robot" reveal its status:

1. Conjunctions: *on the other hand robots have excellent geometric accuracy.* Extraction from the data:

(41) versatile and are able to improvise ah *on the other hand robots ah have excellent geometric accuracy* it's never tired ah t

2. Preposition: *as machines.* Extraction from the data:

(40) ah as just ah robots ah ah *as machines* ah as ah in more than just robots there are two types of robots that we look at there's a there ar

3. Pronouns: *they need mobility to use.* Extraction from the data:

(42) rch another aspect of mo ah service ah service robots ah mobile robots *they need mobility in order for them to be able to to use* for

4. Adjectives: *3 arms in the operating table, surgical system (5 instances), industrial, two types that we look at (2 instances), service (4 instances), machines.* Extraction from the data:

(15) ch area which is quite a bit a research in the world with the robot *surgical system* why we are thinking about robot surgical

(31) there are *two types of robots that we look at* there's a there are just robot ones that are used in factories these are mainly to achieve prec

3. The research to conduct on robots

This prosody was found 11 times in the lecture. Collocations of words from conjunctions, prepositions, verbs (base and -ing forms), and noun with the word

"robot" describes the researches that is presently or is considered to be conducted on robots:

1. Conjunctions: *so only make local control, but to compare various attributes a surgeon and a robot is able to handle, and common strength between robot and human limitations, rather than we develop our own robot.* Extraction from the data:
   (10) ng to say outright that we are going to replace surgeon with robot *but we are just comparing the various attributes* that this t
   (25) e use ah on the shelf robot *rather than we develop our own robot* and basically ah run the robot using visual reality system
2. Preposition: *in this case we use the shelf robot.* Extraction from the data:
   (35) have the industry robot *in this case we use ah on the shelf robot* rather than we develop our own robot and basically ah r
3. Verbs (base and –ing forms): *develop our own robot, need to have simple intelligence, run into the area of surgical robots, compare to the human surgeons, using visual reality to run it.* Extraction from the data:
   (4) her than we develop our own robot and basically ah *run the robot using visual reality system* ah ah then the surgeon of cou
   (37) rld with the *robot surgical system* why we are thinking about robot surgical system if we *compare the human surgeon* robots
4. Noun: *Asian Mobile Robot Japan in Tokyo Institute Technology (to work with).* Extraction from the data:
   (38) ch with ah hopefully in the next year with ah *Asian Mobile Robot Japan in Tokyo Institute Technology* to get a system that

4. The development of robots

This prosody was found only 2 times in the lecture. Collocations of words from conjunction and pronoun with the word "robot" inform its construction by man from advancement in technology:

1. Conjunction: *that we build.* Extraction from the data:
   (33) way to remap and also ah real time (unclear word) this is a ah ah *robot that we build* for ah but navigation using ah lines or we can se
2. Pronoun: *we can actually allow surgeon to be ergonomics.* Extraction from the data:

(39) him to ah conduct the surgery therefore ah with the use of robots *we can actually allow surgeon to have a more ergonomic*

With 52 occurrences associated with "robot" in the lecturer's speech, it can be concluded that this word carries mostly positive semantic prosodies. The main theme from the corpus was the significant improvement of surgical robots which assist surgeons in conducting surgeries. This robot-assisted surgery is currently a growing trend in the surgical field. Their capability includes surgical navigation during surgery. They too are to provide planning and assistance to surgeons, while letting the human staff concentrate on more crucial aspects of the surgery.

4.2 Negative Semantic Prosodies on "robots"

Beside the positive semantic prosodies explained above, a few instances of negative prosodies were also discovered. An illustration of the negative prosody in the spoken corpus from the word "robot" is described below:

1. The state of robots

This prosody was found only 1 time in the lecture. A collocation of word from conjunction informs its status as only the human's assistance in surgery:

1. Conjunction:

(10) ng to say outright that we are going to replace surgeon with robot but we are just comparing the various attributes that this t

2. *The production of robots*

This prosody was also found only 1 time in the lecture. A collocation of word from pronoun tells its production is decreasing quite significantly in the past few years:

1. Pronoun:

(17) n to human being and as well as toys if you look at the industry of robot their market has drop to about fifty percent ah still a large a ve

3. The research to conduct on robots

This prosody was found only 1 time in the lecture as well. A collocation of word from verb + NOT explains the research on this technology does not benefit in all

areas of robots but on some that proposes the quality of asperity:

1. Verb + NOT

(55) basically narrow down on what areas that we can just use robots not all but it does offer attractive features asperity enh

Simply 3 occurrences of the negative semantic prosodies were discovered in the corpus. The lecture concluded that robots were not going to take over human beings in conducting surgery. However, they were to be of great assistance to the surgeon in terms of strength, as the robots were more resistant as they do not eat, sleep, or get exhausted. Nevertheless, humans have better ability in judgments, position and asperity.

Other negative prosodies of "robot" give a view on how the production of robots are currently decreasing in the market area and not all research on robots as surgical assistance can enhance its sell, except for the ones that benefits the human in offering enhancement for attractive features of asperity as surgical assistance.

4.3 Common Words Collocated with "robots"

From the corpus, it is learned that surgical robots in the ergonomics field are equivalent to intelligence, service and machines. The analysis of semantic prosody revealed four common words that were collocated with "robot." The words are:

1. Service

There was a frequency of 8 collocations on this word. Some examples in the corpus are:

(48) really any challenge anymore but the challenge is in the service robots these are robots with uhm vast three superior intelligence or

(52) stem another research another aspect of mo ah service ah service robots ah mobile robots they need mobility in order for them to be a

(56) nics will ah accelerate this increase the world market for service robots if you look by the areas of the applications they are roughly b

The service robots discussed in the corpus are commonly used for household chores; they are also known as domestic robots. Researchers occasionally upgrade the significant potential of robots in order for them to be accepted by society.

2. Machines

There were 20 collocations found for this word. The examples from the corpus include:

(40) ah as just ah robots ah ah as machines ah as ah in more than just robots there are two types of robots that we look at there's a there ar

(54) of it as well is motion interaction because we see this kind of ah robots or machines are meant to ah interact with human being and if

(63) physical, physiological, and psychological so we we move on to robots which are machines and by interest is more on ah as just ah r

Robots are also defined as machines, where they consist of parts that perform or assist in performing any type of work for human beings. The advanced technology today is even attempting to implement intelligence into this device to upgrade their interactions and services for man.

3. Surgical system

There were 15 collocations found for this word. Some examples in the corpus are as below:

(14) there is ah ah significant improvement in the use of surgical robot system the Zeus robot surgical system is another robotic

(15) ch area which is quite a bit a research in the world with the robot surgical system why we are thinking about robot surgical

(26) d ah what I would like to conclude is that the neural of the robot *surgical system* is perfect to demonstrate how to understa

This lecture was to promote the use of robots in performing surgery and ways to improve its involvement in the surgical system. Therefore, the robots in this field are also commonly referred to a surgical system. Advantages from their assistance in surgical procedures can demonstrate precision, smaller incisions, less pain, and quicker healing time for the patients.

4. Intelligence

From the corpus, there were 13 collocations of the word "intelligence" with "robot." A few examples extracted from the corpus are as below:

(32) are things that ah simple intelligence that we think is simple but a robot need to have if people are moving around then if the objects a

(48) really any challenge anymore but the challenge is in the service robots these are robots with uhm vast three superior intelligence or

(57) enge anymore but the challenge is in the service robots these are robots with uhm vast three superior intelligence or expected to have

The intelligence discussed in the collocations is the one stimulated by robots. These machines have been implemented intelligence to process information quicker and more accurate. They give further service to human in domestic assistance, assembling products and handling dangerous materials.

5. Results and Findings

The operating scopes of semantic prosody can affect wider stretches of text (Partington, 2004, p. 151). From the spoken corpus, the lecturer as the speaker had presented more positive semantic prosodies on the word "robot" than negative, where 52 occurrences were found for positive (94,5%) and 3 occurrences were found for negative (5,5%). Words mostly collocated with "robot" in the data were *service* with 8 collocations, *machines* with 20 collocations, *surgical system* with 15 collocations and *intelligence* with 13 collocations.

It can be seen that the word "robot" in his lecture may not have an effectual connotation until it is used in context with the words that collocate it, in this study they are *service*, *machine*, *surgical system* and *intelligence*. To conclude, the semantic prosodies that belong to an item is the result of the interplay between the items and its typical collocates (Xiao & McEnery, 2006).

6. Discussion and Conclusion

The data in this study is limited to only the talk of a lecturer on promoting the research of robots to generate more interest in the development of robot technologies. After mentioning that the "market of robot" has dropped recently, he provided more encouraging comments on the advantages that robots can provide for human beings. The lecturer challenged the field of ergonomics, particularly in Malaysia, to further improve the development of robots, especially with the progress of providing effective and efficient function of robots in serving human beings.

Xiao and McEnery (2006) said that semantic prosodies are typically negative, with relatively few of them bearing an affectively positive meaning. Thus, a speaker or writer can also violate a semantic prosody condition to achieve some effect in the

hearer (Louw, 1993, p. 173). Therefore, in this study, from the views of an engineer, the word "robot" bears a number of positive prosodies compared to negative. Thus, from television programs, movies, newspapers, magazines and other mass media, "robot" may carry other prosodies as well to the general viewers. Due to the limitation of this study, further research towards general viewers' point of view is hoped to be pursued by other researchers.

The operating scopes of semantic prosody can affect wider stretches of text (Partington, 2004, p. 151). Consequently, to study semantic prosodies of particular words in its natural context by using the computer corpus research in corpus linguistics is a significant method as it is competent to process significant quantity of data with accuracy. Additionally, the concordance program can help linguists analyze texts to reveal patterns undetected by the human's intuition.

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