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A corpus-based study on images of family members

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Abstract

Innovative computer technology has sparked a revolutionary change in the area of language analysis. Individual researchers are increasingly likely to access huge corpora containing several hundred million words and to analyze the data using highly developed language analyzers via the Internet. Sketch Engine is one of such online language analyzers, which regards the Internet as a data source for linguistic studies. The online system allows us to analyze a wide range of Japanese texts with more than 400 million words, as well as texts in other languages. In this paper, we will examine the use of the words for family members in Japanese texts and reveal images of each member role hidden in the same.

Introduction

Language is said to be a vehicle of thought. By analyzing language which is widely and repeatedly used throughout society, images or stereotypes that most people resident there mentally cherish, whether consciously or unconsciously, will surface (Hunston, 2002; Krishnamurthy, 1996; Stubbs, 2002; Teliya et al., 1998). Previous research in this academic field would often involve text adopted from mainly printed books, magazines or newspapers. The volume of such data was relatively small and the target text was usually limited to "passive" examples, which were written by professional writers or novelists and received by ordinary people. Text written by ordinary citizens in everyday life was often excluded from the data to be studied.

However, innovative computer technologies allow us to compile a considerable amount of data through the Internet, including texts written by ordinary people, and analyze them to find how a particular word tends to be used in a wide range of texts, from official documents to informal chat. Kilgarriff et al. (2004) insist that the more data we have, the better placed we are to present a complete and accurate account of

a word's behaviour (p. 105), and they suggest the advantage of the web as a potential large corpus for language study:

> As more and more documents are produced electronically, as the web makes so many documents easily available, so it becomes easy to produce ever larger corpora.
> (Kilfarriff et al., 2004. p.107)

Their claim "the larger, the better" is true in one sense, especially when we study the relationship between the text and society. However, text on the Internet is being deleted, modified and added to every second. This will not allow researchers to share the results of the study.

The first computer corpus is said to be the Brown Corpus, which was designed as a balanced "reference corpus" (Meyer, 2002, p. 16). A reference corpus is static and fixed so that corpus-based study can be replicated and the results confirmed by other researchers. We need to use a larger corpus but must share the results. In this paper we will use a "web-based corpus query tool", the Sketch Engine, introduced by Kilgarriff et al. (2004), and the JpWaC (Japanese Web as Corpus), a large web corpus containing Japanese texts adopted from the Internet, which is fixed and loaded into the Sketch Engine, in order to study the images of family members in Japanese society.

The Sketch Engine is one of the most reliable corpus tools. According to Erjavec et al. (2008), it has been used by dictionary publishers such as Oxford University Press or Macmillan. The JpWac uses the method suggested by Baroni & Kilgarriff (2006) to compile the data, and it consists of texts obtained from about 50,000 web pages and contains just over 400 million tokens (Erjavec et al., 2007, p. 3).

Language reform and social change

Language reflects society and also shapes it to some extent. Feminist advocators assume that the use of sexist language will segregate women from men (Maggio, 1991; Miller & Swift, 1980). Spender (1980: 139) even argues "it is language which determines the limits of our world, which constructs our reality." Researchers in sociolinguistics mostly assume the existence of a kind of relationship between language and society, albeit not insisting that language determines society (Pauwels, 1998, pp. 82-84). The second feminism movement, which originated in the US, began in the 1960s. They demanded the equality of both sexes in language as well as social life. The language reform advocacy spread from the US to other English speaking countries, and at last to Japan in subsequent decades. How did it spread nationwide? It was the Japanese government who led the reform.

In 1994, the Japanese government amended the Equal Opportunity Act, since which time treating both sexes differently or using sexist expressions in classified ads, which may lead to stereotypes, have been legally banned in Japan. The legislation relevant to sexist job titles was also revised in 2001 to secure equal employment opportunities for both sexes, and some newly coined gender-free Japanese job titles started to be used officially. For example, the traditional job title *kango-fu*, referring to a female nurse, was replaced with the gender neutral job title *kango-shi*, referring to a nurse regardless of sex. In the previous study, Ishikawa (2008), the author used the BCCWJ (Balanced Corpus of Contemporary Written Japanese) compiled by the National Institute for Japanese Language, and studied the use of sexist job titles. This study showed that the frequency of sexist job titles in white papers and official reports has dramatically decreased in these years.

The feminist language reform campaign in Japan has been conducted mainly by the authorities or government, but avoiding sexist job titles in legal documents and official reports might also have raised public awareness of gender discrimination in general. Various guidelines for gender-fair language use and treatment have been drawn up everywhere, from in the world of publishing, to that of education. Those who seem to have conformed to the feminist advocacy are avoiding or at least trying to avoid the use of sexist language at workplaces, or eliminating gender stereotypes in textbooks, curricula, classroom management. Many attempts have been made to establish a gender-equal society. Nowadays, it is relatively common to encounter newly-made gender-neutral job titles used in newspapers, TV reports, or even dramas and to find details in school textbooks of women working in the front line.

The previous study showed that the frequency of gender-specific job titles in Japanese documents has decreased drastically these days. A survey conducted by the Statistics Bureau and the Director-General for Policy Planning shows the number of women working outside the home is actually increasing. According to the survey

- the ratio of working women to working men is approximately three to four
- nearly 50% of wives and 80% of husbands have occupations.

Most Japanese are presumably aware of the increasing number of women working and are now avoiding sexist job titles in their writing. However, closer scrutiny of the text may reveal hidden stereotypical images of women and men, despite the lack of explicit sexist expressions. Gender stereotypes lurking in Japanese society may reflect the text, while discriminatory images in the text can reinforce stereotypes in the society.

In this study we will use the JpWaC, as mentioned above, to examine the frequency and collocation pattern of gender specific words, which are used very frequently in

everyday life and are not considered to have sexist connotation at first glance. It is much easier for writers to avoid sexist language in terms of gender specific job titles or sexist addresses in their writing, but the very frequent use of certain words and related collocation patterns may possibly reflect the writer's subconscious attitude and submerged stereotypes.

Previous studies

According to Stubbs (2002), words acquire meaning as they are used in society. He argues that "words do not have fixed meanings which are recorded, once and for all, in dictionaries" (p. 13) and that a corpus study on days of the week will show the structure of the culture. "Sunday" is used twice as much as "Tuesday" and "there are cultural reasons why people talk more often about the weekend" (p. 17). For the same reason the frequency of "Saturday night" and "Friday night" is much higher than that of "Sunday night." "Sunday" tends to collocate with "afternoon" rather than "night", and Stubbs argues that "culturally and communicatively competent native speakers of English are aware of such probabilities and of the cultural frames which they trigger" (p. 17).

Stubbs (2002) studied the use of "little" and "small" and found they have different collocates. The study results show that "the most frequent noun to co-occur with *little* is *girl*, and the most frequent adjective to co-occur with *girl* is *little*. ...the phrase *little girl(s)* is 30 times as frequent as *small girl(s),* whereas *little boy(s)* is less than 5 times as frequent as *small boy(s)*" (p. 162). Another point the study clarified is the fact that the words preceding "little" tend to have some connotations of the speaker's evaluation, whether positive or negative. It can be concluded that the word "little" is more likely to collocate with words that can be "cute" or "strange" (p. 163). Studies on the frequencies and collocation of a particular word can clarify the ideas, customs, or attitudes of the people living in the society.

Ishikawa (2003; 2005) investigates the behavior of words referring to women and men seen in four corpora: the Brown Corpus (AmE), the LOB Corpus (BrE), the FROWN Corpus (AmE), and the FLOB Corpus (BrE). The first two contain English texts written in 1961 and the latter two collect English texts written in 1991 and 1992. The feminist language reform commenced in the US in the 1970s and soon spread to other countries. The study is expected to show the chronological and regional changes of the frequency and collocation of words referring to women and men. The results of the study help reveal some images of women and men in the 1960s and 90s by analyzing the corpora, which were compiled using the same method but with different data. Before going further, we will review the study in this section.

According to the study, the frequency of "man" plummeted, while that of "woman" increased for three decades in both American and British English. One possible reason is that the feminist movement led many people to consider the generic use of "man" as

sexist and to tend to avoid it. The reason for the increased use of "woman" is that the movement made women "visible" in some way (Spender, 1980, p. 64), and the fact that people had more chances to discuss women after the feminist movement anyway, whether good or bad. The change in the use of "woman" and "man" is shown below in Figure 1.

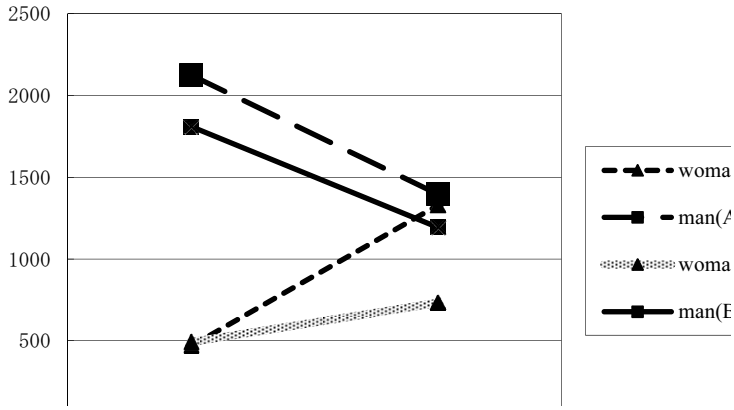

Figure 1. Use of wo/man in the 1960s and 90s (Ishikawa, 2005, p. 535, revised)

A study on the collocations of "woman" and "man" helps reveal gender stereotypes in language. Positive adjective modifiers "good" "great" and "reasonable" tend to collocate with "man" but not "woman". The positive adjective collocating with "woman" is "beautiful", and it modifies mainly appearance. The negative adjectives "strange", "paranoid", and "lonely", meanwhile, tend to collocate with "woman" and the use of "battered" reflects the social problem of domestic violence. Tables in Ishikawa (2005) are revised and reprinted as Tables 1 and 2 below.

Here, we will briefly examine the collocations of "wife" and "husband", and "mother" and "father" as studied in Ishikawa (2005). In both British and American English, "wife" and "young" tend to collocate. However, after the feminist movement in the 1990s, some positive adjectives such as "academic", "intelligent" or "strong-willed" collocated with "wife" in American English. Collocations of "mother" showed the traditional idea that mothers should be at home and that in the early 1990s "working mothers" were still in a minority. By examining the collocations of "mother", a picture might emerge that a mother was responsible for bringing up a child when a mother and father did not get married or parted at that time. "Single", "unwed" or "unmarried" tend to collocate with "mother" rather than "father".

We have seen the use of male and female terms in English as described. The four replicated corpora are suitable for examining the chronological change in language use,

however, the corpora undeniably lack sufficient scale to grasp the images of the gender roles throughout the entire society. In the next chapter, we will examine the use of words referring to women and men in Japanese texts in order to clarify whether some gender images are hidden in language or not.

Table 1.Collocations of wo/man in American English

Brown				Frown			
adj.+WOMAN		adj.+ MAN		adj.+ WOMAN		adj.+ MAN	
old	14	young	83	young	23	old	60
young	11	old	75	old	12	young	49
strange	3	big	18	black	8	white	25
strong	2	white	13	ideal	4	black	23
pink	2	fat	12	older	3	other	12
paranoid	2	good	11	French	3	dead	8
lonely	2	common	10	white	3	married	8
Japanese	2	such	9	battered	2	Sioux	7
beautiful	2	great	8	beautiful	2	great	6
American	2	dead	8	average	2	younger	6
				married	2	single	6

Table 2.Collocations of wo/man in British English

Lob				Flob			
adj.+ WOMAN		adj.+ MAN		adj.+WOMAN		adj.+ MAN	
young	18	young	76	young	23	young	57
old	12	old	32	old	14	old	32
married	7	little	31	other	11	other	14
white	4	white	18	older	7	big	11
		younger	9	married	5	good	10
		military	8	aged	2	older	10
		great	7			great	7
		good	6			poor	7
		haired	6			younger	6
		primitive	6			elderly	5
		reasonable	6			little	5
						white	5

A corpus study on gender specific words

Target words

The words investigated here can be semantically made into a pair with the same semantic components except the gender; for example, "mother" (*haha* or *haha-oya*) and "father" (*chichi* or *chichi-oya*) are considered as a pair. Each pair is chosen based on the definition given in *Daijirin the second edition*, a renowned Japanese dictionary. In the dictionary *haha* is defined as "a female parent" and *chichi* is shown as its counterpart. The male term *chichi* is defined as "a male parent" and *haha* is shown as its counterpart.

The six pairs chosen for the present study indicate family roles such as mother, father, daughter, or son. The remaining four pairs refer to women and men in general. The latter group has two subgroups according to the semantic component of the pair words. One subgroup has an additional component, namely "young". Therefore two pairs mean "boy" and "girl", and the other two pairs mean "man" and "woman" respectively. Furthermore each subgroup has different etymologies. One pair includes words which originally came from Chinese and the other has words of Japanese origin. For example, *on'na* and *josei* are both commonly used to refer to a woman in general, but the former was previously (and is still) used before foreign elements came into the Japanese language. The target words are shown below in Table 3 with the number of frequency of each word.

Table 3. Counterparts referring to woman and man

Japanese pair word	translation	female	male	
tsuma/otto	wife/husband	23335	25767	***
haha(-oya)/chichi(-oya)	mother/father	46940	36764	F ***
oba/oji	aunt/uncle	1463	1309	F **
shimai/kyoudai	sister/brother	4731	9095	***
sobo/bofu	grandmother	3381	3132	F **
musume/musuko	daughter/son	30556	21709	F ***
shoujo/shounen(orig. Chinese)	girl/boy	14093	25116	***
on'na-no-ko/otoko-no-ko	girl/boy	16308	6486	F ***
josei/dansei(orig Chinese)	woman/man	96985	38411	F ***
on'na/otoko	woman/man	43111	65740	***
Sum		**280903**	**233529**	**F *** **

$p<.05$ **, $p<.001$ ***

Target words indicating family roles are: 1. *tsuma* (wife), *otto* (husband), 2. *haha* and *haha-oya* (mother), *chichi* and *chichi-oya* (father), 3. *oba* (aunt), *oji* (uncle), 4. *shimai* (sister), *kyoudai* (brother), 5. *sobo* (grandmother), *sofu* (grandfather), 6.*musume* (daughter), *musuko* (son). Target words indicating woman and man in general are: 7. *shoujo* (girl), *shounen* (boy), 8. *on'na-no-ko* (girl), *otoko-no-ko* (boy), 9. *josei* (woman), *dansei* (man), and 10. *on'na* (woman), *otoko* (man). We will limit our discussion to the first pair, *tsuma* and *otto*, where the word for man is used more frequently than the word for woman, and the second pair, *haha*(-*oya*) and *chichi*(-*oya*), where the word for woman is used more than the word for man in the next section.

Data analysis

The JpWaC contains 409,384,405 words and can be analyzed by Sketch Engine, the web-based language analyzing program. The frequency of words in each pair can be investigated by the program, and the word frequencies are compared statistically. If the words in each pair are used in almost the same way, the difference in the frequencies of each word in a pair can be neglected as it is statistically non-significant. The chi-square test is conducted here for comparison, and shows the null hypothesis, namely that a pair of words indicates non-significant differences is rejected at a 1% level in all the samples tested here. The three asterisks *** in Table 1 denote that the p-value indicates less than 0.001. "F" followed by asterisks indicates that the female term in a pair is used more frequently. They are Samples 2 "mother" and "father", 3 "aunt" and "uncle", 5 "grandmother" and "grandfather", 6 "daughter" and "son", 8 "girl" and "boy", and 10 "woman" and "man".

The Sketch Engine contains the Sketch Difference program, which shows the statistically salient collocations of the word in a pair respectively. The Sketch Difference is originally equipped in order to indicate differences of synonyms. In this study we will use the Sketch Difference to detect hidden gender stereotypes. The program will sort the words collocated with the target word into certain grammatical categories, and we will limit our discussion on the modifier of the target word, which is an adjective used on the left of the target word, and the possessed noun, which is on the right of the target word with a pronominal particle.

The program automatically extracts salient collocations but we will neglect the data in the following cases: 1) all samples are found in the same source data, 2) a collocation is a proper noun or part thereof, 3) the frequency of the collocation is comparatively low, or less than five. There are some possibilities whereby a particular collocation which is statistically salient is used by the same writer, or referring to the same person. In that case we should admit that the frequency is

completely dependent on one writer. Sometimes a target word or collocation can be a proper noun or part thereof such as an artist or a song title. As the low frequency is likely to show the less reliability, the collocation detected by the Sketch Difference will be neglected in those three cases.

The Sketch Engine uses several kinds of statistical models to extract the collocation and the log likelihood score will be used in this study. There are three main writing systems in Japanese, which are treated by the program as different words. However, in this study, they will be lemmatized and treated as the same word with different notations.

Results and discussion

Word frequencies

As we have seen in the previous chapter, female and male terms behave asymmetrically in Japanese texts despite having symmetric semantic components. In six of ten cases, the frequency of female terms studied here is higher than that of male terms in a pair. They are "mother", "aunt", "grandmother", "daughter", "girl" and "woman (from Chinese)". Figure 2 visualized the difference of frequencies for family roles and Figure 3 shows the differences of frequencies of Samples 7-10.

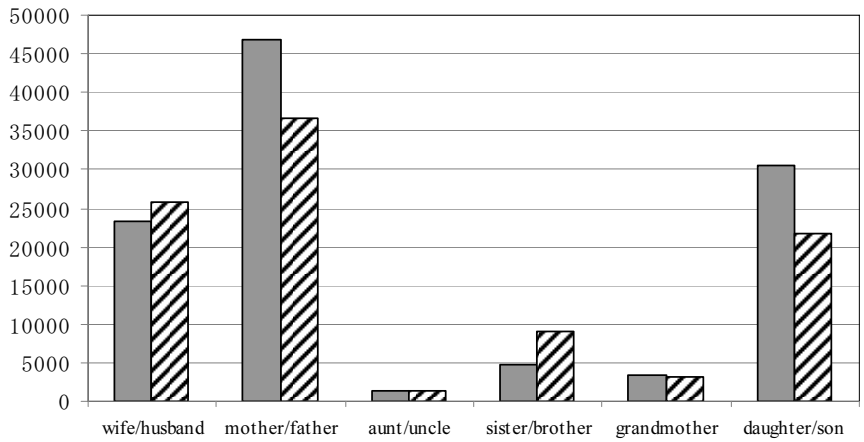

Figure 2. Differences of frequencies for family roles

Ishikawa (2005) showed that the frequency of "wife" in American English and that of "wife" and "mother" in British English were significantly higher than their counterparts "husband" and "father" in the early 1990s as shown below in Table 4.

On the other hand, "son" and "brother" tend to be used more frequently in both American and British English. Compared with the previous study conducted using English corpora, the results of this study appear to show that female terms are used more frequently than male terms in the Japanese corpus and that women are referred to more often and are involved in society.

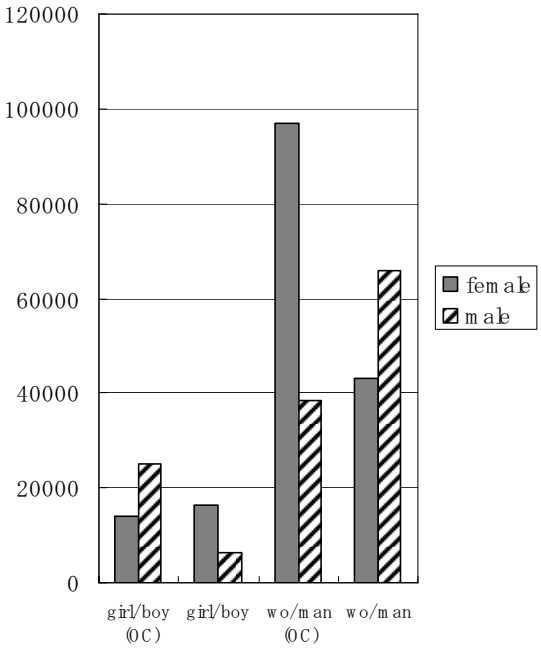

Figure 3. Frequencies of fe/male terms

Table 4. The frequencies of female and male terms in English (Ishikawa, 2005, p. 535, revised)

	Frown (AmerE)		FLOB (BritE)	
	female	**male**	**female**	**male**
woman/man	1329	1395	732	1193***
wife/husband	268**	202	209***	107
mother/father	479	448	437**	348
daughter/son	153	218***	136	192***
sister/brother	143	195**	126	152
grandmother/grandfather	32	29	20	36*
aunt/uncle	38	31	30	56**

There are some differences and similarities in word frequency in English and Japanese. "Mother" and "brother" tend to be used more frequently than the counterpart in a pair in both languages but the frequency of "son" may only be higher than that of "daughter" in English and not Japanese. Japanese contains two terms referring to woman: one of which is *on'na* originating in Japanese and the other *josei* originating in Chinese. The latter female term is used extremely frequently, more than twice as much as its counterpart *dansei.* Conversely, "man" tends to be used more frequently than "woman" in both American and British English. "Wife" can be used more frequently in English while "husband" can be used more in Japanese. In the next section, we will limit our discussion to the pair of "wife" and "husband" (in Japanese *tsuma* and *otto*) and "mother" and "father" (*haha* or *haha-oya* and *chichi* or *chichi-oya*), and investigate their collocations to seek gender images.

Collocations

We will restrict ourselves to discussing 1) modifiers of the target word [modifier + N], and 2) the possessed noun of the target word [N + possessed n]. Part of the list for words which tend to collocate with the female and male terms is shown in Table 5.

Table 5. Modifiers and possessed nouns of wife and husband

Adj. Modifier	wife	husband	Possessed N	wife	husband
beautiful	56*	0	love affair (*uwaki*)	30	70
young	31	11	love affair (*furin*)	14	62
good	40	63	infidelity (*futei*)	13*	0
bad	8*	0	parents' home (*jikka*)	135	127
kind	10	23*	relocation	0	44*
strong	0	7*	death	12	32
			support	0	21*
			parents (*ryoushin*)	45	66
			violence	0	52*
			annual income	11	21
			sperm	0	20*
			surname	0	17*
			absence	0	18*
			legal status (*tusma-no-za*)	30*	0
			mother	28	71
			help (*naijo*)	10*	0
			income	16	56
			colleague	0	23*

Adjectives likely to collocate with “wife” are “beautiful” and “young”, which is also true of English as we have seen above. Judging from the results, “bad” might collocate with “wife”, while “good” and “kind” with “husband”. Although the number of samples including “bad wife” is relatively small and further study is needed before firm conclusions can be drawn, it can be probably assumed that different criteria apply to women than men and collocating verbs might support this assumption. Verbs collocating with “wife” [wife (subject) + verb] demonstrate that the wife tends to “obey”, “get tired” and “weep”, while verbs collocating with “husband” show that the husband tends to “beat”, “drink” and “kill” as is shown in Table 6. An asterisk * indicates collocations of words regarded as statistically salient by Sketch Differences. A Japanese word can be written in different orthographic systems, but in the following table, the orthographical differences of the word will be neglected. For example, 良い and よい are orthographically different words with similar meaning, so here, they are collectively regarded as a single word and their individual frequencies are summed up.

Table 6. Verbs of wife and husband

Verb	wife	husband
go out	5	13
pass away	0	15*
die	19	17
hit/beat	0	5*
drink	0	16*
work	6	15
work hard	0	7*
kill	0	7*
notice/be aware of	0	5*
get tired	6*	0
weep	6*	0
care for	14*	0
hold/take children	8*	0
fall/ill in bed	5*	0
obey	5*	0

A closer look at the possessed nouns reveals more about the criterion for wife. Both wife and husband tend to have love affairs but only the wife is blamed for unfaithfulness. “Wife” collocates with *futei* which means cheating or infidelity. Husbands are more likely to have love affairs than wives (the total number of “love

affairs", *uwaki* and *furin* in Japanese, collocating with "husband" is 132, and that collocating with "wife" is 44), but faithfulness to spouses is only demanded of wives.

Some images of wives and husbands emerge from the collocations. The husband leaves the house for work, has some relations with colleagues, supports his wife and family with his income, and is sometimes relocated. The wife works, has a lower income and helps her husband so that he can work harder. The wife is expected to use her husband's surname and get along with her husband's mother.

Table 7. Modifiers and possessed nouns of mother and father

Adj. Mod	haha	chichi	haha oya	chichi oya
beautiful	12*	0	7*	0
young	11*	0	98*	16
cheerful	7*	0		
good	31*	19	30	46
nagging (*urusai*)			10*	0
stern (*kibishii*)			0	7*
bad			10	6
new	8*	0		
Possessed N	**haha**	**chichi**	**haha oya**	**chichi oya**
womb (*tainai*,*shikyu*,*etc.*)	33*	0	57*	0
revenge	0	26		
anniversary of the death	0	11*		
testament (*yuigon*)			0	12
heritage (*isan*)			0	15
image	14*	0		
study	0	12*		
hand-made	19*	0		
work			29	0
relocate			0	16
absence			0	18*

Table 7 shows part of a list for words likely to collocate with *haha*(-*oya*), "mother", and *chichi*(-*oya*), "father". The adjectives "nagging" (*kuchi-urusai*, or *urusai*) and "stern" (*kibishii*) tend to collocate with female and male parent respectively. Mothers often scold children and tell them to behave themselves, but fathers seem to have few words and to be simply "stern" and "strict" with children. The two adjectives "beautiful" and "young" are saliently used followed by "mother" as well as "wife". The positive word "good", which collocates less frequently with "wife", tends to be used

for "mother". When father is dead, children will discuss his "testament" (*yuigon*) and heritage (*isan*), and sometimes take revenge for him. People tend to seek out a mother's image and they have good old memories of their own mother, but gather to attend father's memorial service.

Conclusion

In the current study, we observed how NS, JLE, and CLE use LA in argumentative essays. Our corpus-based investigation has yielded several essential facts concerning the frequency and usage of LA. Our findings can be summarized as follows:

As we have seen above, in both English and Japanese, wives are expected to be "beautiful" and "young". Especially in Japan, a woman, whether married or not, and whether with children or not, is always expected to be "beautiful" and "young". In addition, a Japanese wife is required to be "faithful" and "helpful" (*naijo*) for her husband and to have a good relationship with both her husband's "parents" and her own (*ryoushin*, and *jikka*). An American or British wife is referred to as "intelligent" or "academic", whereas neither "wife" nor "husband" collocates with "intelligent" or "academic" in Japanese. A Japanese wife is referred to when the issue of whether she is legally married or not becomes problematic. A lawful wife will have the privilege, so "the status of wife" (*tsuma-no-za*) is important but "the status of husband" is not. A minute analysis of language use will reveal gender images hidden in language. It might be said that "parents", "family name", and "legal status" seem to be more important than individual characteristic features in Japan.

Both "mother" and "father" tend to be described from the viewpoint of children in Japan. Japanese mothers try to teach them how to behave and often scold them but their words are not taken seriously. They are simply "nagging". However, fathers are not regarded lightly. Their will is always respected even after they pass away. Children might have the "image" of their mother in their minds after she is deceased but they will soon have a "new mother". Both in English and Japanese, "father" tends to collocate with "absence," for he is often "relocated" and works far away from home. Some mothers also work outside the home, but they are never relocated.

As Lakoff (1975) argues "language uses us as much as we use language" (p. 3), language affects us every day when we use it, little by little, if not greatly, continuously and constantly. It is possible that language makes gender stereotypes more salient and visible to those using the language. Language reflects and also creates society and we should remain aware of that fact.

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