

**The case study of high pitch register
in English and in Japanese:
Does high pitch register relate to politeness?**

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This study aims to investigate a pitch register in English and in Japanese. Japanese seems to have a high pitch register relating to ‘politeness’ or ‘deference’ whereas English does not seem to use a high pitch register for this purpose. However, English speakers have been observed to use high pitch in friendly greetings. Recordings were collected to measure the average fundamental frequency of both English and Japanese in order to compare the pitch register used in different circumstances. The recordings consisted of reading, spontaneous speech and role-plays. From the results of the experiment, it was discovered that a high pitch register was used in a style relating to ‘friendliness’ among native speakers of English such as when they greet their friends on the phone. On the other hand, a high pitch register was used in a style relating to deference or politeness among native speakers of Japanese, such as when they talk to their clients or customers, and it was more pronounced in the case of female speakers of Japanese than with male speakers of Japanese. Thus, it was revealed that the use of a high pitch register to show politeness is a particular feature of Japanese women’s spoken language.

1. Introduction

English and Japanese are very different from each other in terms of their prosodic features. English is a stress-accent language, whereas Japanese is a pitch-accent language. In Japanese, pitch changes are very important in determining the meaning of words. Japanese is called a pitch-accent language because the meaning of words depends on the placement of the accent. Pitch accents relate to the accented syllable which is the syllable having a strong stress put on it. For example, /(¹ame/ means 'rain' and /a¹me/ means 'candy'. Accented syllables have a high tone, and surrounding syllables have low tones.

Japanese people seem to use high pitch to show 'deference', for instance, when talking to their customers, clients or boss. It is notable particularly in the case of women, but is also found in men's speech as well. Both also employ other ways of showing deference such as using special words and expressions. However, it is generally considered as a typical and peculiar phenomenon of Japanese to vary pitch in terms of 'politeness'. Native speakers of English do not seem to use high pitch in corresponding situations although they may use high pitch for emphasis or when talking to a baby but not to show deference. They rather use low pitch for politeness and high pitch for friendliness. English women tend to use high pitch when they say 'hello' or 'bye' to their friends when speaking on the phone, whereas Japanese women tend not to use that high pitch in the same situation.

This paper will consider in what situations Japanese people use high pitch, and how far they vary pitch according to different

situations. A comparative study based on an empirical investigation of native speakers of Japanese and English will then be presented.

What is pitch?

Larynx and pitch

One of the functions of the larynx is related to the sound production in speech. The larynx has vocal folds that affect the progress of the air stream from the lungs to the vocal tract. In normal speech, the vocal folds are open and air comes through them. There are two kinds of speech sounds, 'voiced' and 'voiceless'. 'Voiced' sounds are made by the vibration of the vocal folds, which means the repeated opening and closing of the vocal folds which can be seen in all vowels and voiced consonants such as /b/, /n/ or /z/. In contrast, 'voiceless' sounds are normally made by opening the vocal folds with no vibration of the vocal folds. In normal speech, the pitch of the voice varies continuously.

Frequency shows the cycle of vocal folds vibration per second. If it is 100 Hertz (Hz), it means 100 cycles per second. Human ears generally perceive vibrations from about 20 Hz to about 20,000 Hz. The range 100 to 5000 Hz are important frequencies to the speech signal. Vocal folds generally vibrate between at about 80 Hz and about 500 Hz in speech.

In terms of acoustics, pitch is related to the fundamental frequency (F_0) of the sound wave which is related to the frequency of vocal folds vibration. Pitch is the frequency of the vibration of the vocal folds during voicing and it is affected by how the vocal folds vibrate. As the frequency of the vocal folds vibration

increases, the pitch becomes higher. On the other hand, as it decreases, the pitch becomes lower. Stretching the vocal folds changes the pitch of the voice. When they are stretched, the pitch is high. When the airflow from the lungs increases, the pitch also becomes higher.

The pitch of men's voice is low and the pitch of women's voice is high. Men's larynx is basically larger than that of women which means that men's vocal folds are longer than those of women. The longer vocal folds vibrate more slowly than the shorter ones, in other words, the former has a lower pitch and the latter has a higher pitch. The pitch range of female speech is generally between around 180 and 400 Hz and that of male speech is between around 80 and 200 Hz (Hart 1990 p12).

There may be different tendencies between men's and women's speech. Crystal (1975 *The English Tone of Voice* p85-86) points out that:

“Intuitive impression of effeminacy in English, for example, partly correlate with segmental effects such as lispings, but are mainly non-segmental: a ‘simpering’ voice, for instance, largely reduces to the use of a wider pitch-range than normal (for men), with *glissando* effects between stressed syllables, a more frequent use of complex tones (e.g. the fall-rise and the rise-fall), the use of breathiness and huskiness in the voice, and switching to a higher (falsetto) register from time to time. (This provides an interesting contrast with Mohave, for instance, where a man imitating a woman (or transvestite) does not change falsetto, but uses his normal voice, and rather imitates verbal and segmental effects (see Devereux 1949:269)).”

Female speakers vary their pitch wider than male speakers either in order to make communication smoother and easier by varying their pitch or they may try to keep listener's attention by doing so.

Loudness relates to the intensity of sound. Loudness varies in terms of the degree of the force of the air which is pushed up from the lungs during the vibration of the vocal folds. When the force is great, the loudness will also be great.

Pitch variation makes it possible to transmit different information. As has been mentioned above, pitch variation is related to speech sounds and also provides information about the speaker, such as his/her sex and age. Moreover, pitch variation provides paralinguistic information such as the speaker's emotional state.

Pitch has a different role depending on the language. English is a stress and intonation-accent language. Jones (1960: p275) defines intonation as "the variations which take place in the pitch of the voice in connected speech, i.e. the variations in the pitch of the musical note produced by vibration of the vocal cords." In brief, it can be said that intonation is a pattern of the pitch movement of the voice in connected speech. Although intonation may change the meaning of the sentence as a whole, it does not change the meaning of individual words in English. Intonation can control grammatical meaning and attitudinal meaning. That is, intonation functions to determine the sentences as declarative or question and to show the different kinds of attitude such as politeness and self-importance. Moreover, it can show the various feelings such as doubt or surprise. Intonation conveys a speaker's intention and even if a

speaker utters a sentence with the same group of words in the same order, it can mean different things if he/she uses different intonation patterns. A speaker chooses the proper intonation to express his/her thought or attitude so that the hearer can perceive if a speaker is, for example, happy, bored, surprised, interested, being honest, lying, friendly or unfriendly, and so on. If a speaker says “All right.” with a rising tone, it is a question. However, if a speaker says “All right.” with a falling tone, it is a response to a question. If a speaker says, “She is a student, isn’t she?” with a falling tone, she/he is sure that she is a student and confirms it to the hearer. If it is uttered with a rising tone, she/he is not sure if she is a student or not. Intonation plays a very important role in communication.

In this study, I will use the term ‘stress’ meaning lexical stress which is different from rhythmic stress. Lexical stress (LS) relates to words whereas rhythmic stress relates to sentences. For example in English, a word bears at least one LS syllable and sometimes bears more than one LS syllable. In the case of more than one LS syllable, one LS will be primary and the others will be non-primary. A primary stress syllable sounds more prominent and audible, which is not necessarily but often realised with accent. The former is indicated with ^ˈ, and the latter with _ˌ such as: /^ˈmeni/ ‘many’ and /_ˌsætɪs^ˈfækʃ^ən / ‘satisfaction’. When it comes to the case of connected speech, lexical stresses are not always obtained although one-syllable words can bear stress. The term ‘stress’ will be used ignoring this case in this study.

In a tone language such as dialects in Chinese, the pitch movement of the voice has a different function from that of English, that is, a phonemic function. Pitch patterns should be used

properly depending on the word's meaning otherwise the meaning would not be conveyed properly. For example, the word 'ma' in Mandarin Chinese has four possible meanings according to the pitch difference:

[ma] in high level pitch	'mother'
[ma] in high rising pitch	'hemp'
[ma] in low / fall - rise pitch	'horse'
[ma] in falling pitch	'cold'

Japanese is a pitch accent language in which the lexical accent is marked by the pitch movement, not by the stress. As Clark and Yallop (1995: p348) have observed:

“Since there is really no tonal option — i.e. no opposition of tone type, such as high versus low, or rise versus fall — but only a choice as to where the ‘accent’ is located.”

The preceding syllable has the high pitch accent and if there is a following syllable, it drops to a lower level. There is no fall when a word is unaccented. It is possible to predict the pitch of any syllable which precedes the accented one, because a word-initial syllable is low and any other syllables are high before the accented syllable. An example of this can be seen in the Japanese word 'hashi':

[hashi] with the accent on the first syllable	'chopsticks'
[hashi] with the accent on the second syllable	'bridge'

[hashi] with no accent

'edge'

Politeness in English

Sifianou (1992:p86-88) carried out a survey about the concept of politeness among English and Greeks. The result showed that the English had much clearer and more straightforward answers about the definition of the concept of politeness: the consideration of other people's feelings by conforming to social norms and expectations.

There are various ways to show politeness in English. For example, they are shown in the following expressions. These expressions are on a descending scale of politeness :

1. Would you mind -ing...?
Would you...?
Will you...?
2. I was wondering if you could possibly...
I was wondering if you could...
You couldn't (possibly)..., could you?
I don't suppose you could possibly...
Do you think you could...?
Could you...?
Can you...?
3. I would like (to)...
I want (to)...
4. I beg your pardon?
Excuse me?
What did you say?

- Sorry?
What?
Eh?
5. Hello, how are you?
Hi, all right?
 6. Thank you very much.
Cheers.

The word ‘please’ would be a politeness marker when it is attached at the beginning or at the end of the utterance:

“Stop chattering here.”
“Please stop chattering here.”

The former sentence sounds stronger or forceful and the latter sounds softens the abruptness.

Particular intonation patterns are also associated with politeness: “Thank you.” with a falling tone sounds more polite than with a rising tone. On the other hand, “Stand up, please.” with a falling tone sounds rather a command and the same sentence with a rising tone sounds more polite.

A falling tone is used very often with wh-questions. High fall shows politeness and interest, for example:

“What are you ^ˋdoing this ^ˊweekend?” (politeness)

Intonation plays a very important role in conversations in English. It does not change the meaning of each word, but it can

change the meaning of the whole sentence. That is, it can alter grammatical and attitudinal meaning. Native speakers of English can use several kinds of intonations appropriately and can imply their feelings or their attitudes using intonation. Non-native speakers of English may use intonations inappropriately. Although they want to show their politeness using particular intonation, they may use the intonation wrongly and appear to be impolite. O'Connor and Arnold (1973: p2) have highlighted this:

“This is very important — English speakers are able to make a good deal of allowance for imperfect sound-making, but being for the most part unaware of the far-reaching effects of intonation in their own language they are much less able to make the same allowance for mistakenly used tunes. The result is that they may hold the foreigner responsible for what his intonation *seems* to say — as they would rightly hold an Englishman responsible in a similar case — even though the tune does not faithfully reflect his intention.”

It can be readily seen, therefore, that intonation is one of the important aspects of English for a foreigner to learn. Foreign learners (and teachers) tend to put more stress on pronunciation or grammar when they study (and teach) English. However, as has been shown above, more consideration should be placed on intonation as well as other aspects of language learning. In other words, we cannot predict the attitude of the speaker only from the literal meaning of the each word. However, the meaning of a sentence cannot be known only from intonation. We can think of many possible intonations for one sentence, and no sentence type

always takes only one intonation pattern as they range very widely. Therefore, it is necessary to consider not only about intonation but also about the context, the speakers' expression or gestures. In addition, other aspects such as voice quality, speed of utterance and loudness affect intonation. Consequently, for non-native speakers of English it is necessary to pay attention to intonation as well as these other aspects of speech production if misunderstandings are to be avoided.

Politeness and pitch in English do not seem to correlate with each other. The pitch rather seems to relate to other factors. Margaret Thatcher, the former British Prime Minister, was trained to make her pitch lower and narrower in range so that the audience could listen to her voice in a noisy situation. She was advised to keep her pitch stable to make her voice sound clear. People usually tend to use high pitch when they talk to an audience. However, women tend not to use high pitch because, as their pitch is naturally higher, if they make it much higher, their audience would regard it as emotional rather than powerful. Women's voices were assumed not to be suitable as announcers or newscasters because they sounded too light to read the news. (Romaine 1994: p106) It is assumed that low pitch would seem to be associated with a sense of authority.

Politeness in Japanese

What the term 'politeness' means differs depending on culture. Ide et al. (1992) investigated how politeness is conceptualised by Americans and Japanese. From that survey, it was discovered that their conceptualisation of 'politeness' was very different from each

other. The Americans evaluated 'polite' and 'friendly' on the same axis and only considered 'polite' and 'friendly' as 'good' concepts. The Japanese, on the other hand, did not evaluate 'polite' and 'friendly' on the same axis. (Tsuji-mura ed. 1999: p460)

Japanese has an honorific form which is known as 'keigo' in Japanese and which Japanese people tend to acquire as they become older. Although there is no need for very small children to use 'keigo', other children are generally gradually required to use it depending on the situation, for example when they talk to older people, and they are taught how to use it both at school and at home.

The honorifics play an extremely important role in Japanese society although most people do not use it for everyday communication until they join the work place such as in a company or in the service industry including restaurants and hotels. Young people's Japanese is not appropriate for some kinds of jobs, but they will find it necessary to learn how to speak appropriately when they start working. In particular, larger companies invest time and money teaching their new recruits how to speak "appropriately" to their clients or customers and even to their superiors.

There are two main types of expression in 'keigo': 'sonkeigo' (honour language), used to elevate superiors, and 'kenjogo' (humble language), used to lower oneself. In order to know how one should speak, the relative status of the other person must first be assessed, which is one of the reasons why so much importance is attached to business cards in Japan. 'Keigo' both expresses the superior-inferior relationship, and constantly reinforces it by basing the way whatever is said on a prior recognition of the notion of superiority

and inferiority.

Joy (1993: p56) provided a successful story about a man from Kyoto in Japan who gave up a secure job in the City Hall and started his own confectionary business. He specialised in traditional Japanese cakes using the finest ingredients and succeeded in his business. He mentioned that it was important to use polite language with customers:

“When asked to explain his success, he mentioned, of course, the excellence of his ingredients, but he went further and explained his philosophy of caring for his customers. He emphasised the importance of using polite language with them, and also of meaning sincerely the words which he and his staff used to address them. The words express care, and they must show care, he argued, claiming that the real reason for his success lay in the true feeling he put into the etiquette he used”.

The proper use of honorifics is a tacit rule in the adult community and if they are not used properly, it could be perceived as rudeness. Therefore, if adults use them wrongly, it can lead to a range of problems as well as considerable shame and even the collapse of a business. Japanese people, especially the older generation, are very sensitive about how to use honorifics and may regard people who misuse them as immature or ill educated. In contrast, they may regard people who use them very well as sophisticated and reliable. As a result, honorifics have a function to allow people to create smooth relationships. Although some companies, shops or restaurants train employees to use appropriate

honorifics, the employees probably only know honorific expressions which are needed for their work.

Pitch variation is an important feature of the Japanese language and of honorifics. For example, in restaurants quite high pitch is used, especially for greeting customers. For a non-Japanese this may sound like shouting but in fact it is not and is a way of actually showing their politeness to their customers in their own way. If people at the restaurant were to use low pitch, the customers would tend to regard it as being impolite and unfriendly or possibly, even too elegant and precious. Likewise, when Japanese people pick up the phone, they usually use high pitch; otherwise the person who makes the call may feel that the receiving person is being impolite. Telephone operators are taught to use high pitch to show deference to customers. Shop workers are also usually taught to use high pitch when they serve customers. Joy (1993:p87) also cites a further interesting example about the use of a high pitch. He mentions the voice of women who work in a department store in Japan:

“Lift attendants wearing the same uniform utter information about floors in such stilted tones that they might almost be machines, but here is an example of the correlation between linguistic and bodily wrapping.”

When people talk about serious matters, they tend to use low pitch whereas when they serve customers, they seem to use high pitch. There is a good example showing this peculiarity of Japanese culture. An article about the use of high pitch of Japanese women mentions the liberal use of honorifics as a characteristic of the

speech of Japanese women. According to Horvat (2000), an article relating to the use of high pitch by female clerks at a Japanese department store appeared in the *New York Times* in 1995.

“...But if one accepts the *Times* correspondent’s view that Japanese women are coerced into pushing their voices into unnaturally high registers, how can one explain all the other ways? from vocabulary to grammar? in which Japanese women’s language differs from Japanese male speech? ...the principle of women adhering to a more genteel speech style seems to correspond to Japanese women’s speech, which is expected to be consistently more “polite” than that of males...”

An experiment by Ohara (1997) shows differences in the use of pitch range between men and women. The experiment examined the voice of male and female speakers in spontaneous speech and reading sentences both in English and in Japanese. As a result, interestingly, women used higher pitch when they spoke and read in Japanese than in English. On the other hand, there was not a striking difference in men’s speech even in the different languages and different situations.

Horvat (2000) mentions an article in the Japanese weekly magazine “*AERA*” about the female announcer Etsuko Komiya who was urged to make her pitch lower, because she moved to a serious news programme from a daytime talk show. The average fundamental frequency of the Japanese language is said to be between approximately 100 and 300 Hz. Male speech varies from about 100 to 200 Hz. Female speech varies from about 200 to 300 Hz although it would vary depending on the size of the speaker’s

vocal folds. In the case of Ms. Komiya, Professor Hideki Kasuya told AERA that her voice, which averaged 223.4 Hz in 1992, had dropped to 202.6 Hz by 1995. The lowering pitch parallels other ways in which the speech of Japanese women has begun to approach that of men. Ms. Komiya made her voice more man-like in view of the change in her work position. In her previous position in a daytime talk show, the audience were thought to be women, mainly housewives and talked about celebrities, daily life, fashion, food or home life. Although they sometimes spare a small part for news, they usually choose topics which were close to their immediate lives. When women talk to women about these things, there is no need to use low pitch or to sound masculine. In a serious news programme which is broadcast late at night, however, she is expected to take on a different role from that of a daytime talk show host. The audience are mainly thought to be men and women who work during the daytime and who do not know about what has happened in Japan or even all over the world during their working time. A serious news programme targets these people and therefore there is no time to talk about celebrities or fashion. High pitch would not be a problem for entertainment, but is not regarded as suitable for serious matters. The use of low pitch can be one strategy to get an audience's attention and to explain what is going on in the world. It can be said that the use of low pitch signifies 'authority'.

Ohara's (1997) second experiment examined the meaning of women's higher pitch in Japanese. The recordings were made by two Japanese women uttering some greetings such as 'konnichiwa' which means 'hello' and 'sayonara' which means 'goodbye'. They

were altered to three different pitches using a computer. Male and female subjects were asked to give their impressions of the two women. The subjects had impressions such as ‘stubbornness,’ ‘selfishness,’ and ‘strength’ as the pitches became lower. They got the impressions such as ‘cuteness’ (like a little girl), ‘kindness’ and ‘politeness’ as the pitches became higher. (Tsuji-mura ed. 1999: p462-3) This might be different from what native speakers of English think:

“High register is, in general, associated with greater emotional tension but nevertheless has to some extent become conventionalised. For example, the adoption of a ‘little girl voice’ may be used to signal helplessness.” (Cruttenden 2001: p274)

From Ohara’s experiment, it is obvious that high pitch is highly connected to Japanese society or culture which associates high pitch with politeness.

Some research has also been carried out on sales talks in the United States and in Japan. Tsuda (1984) (Tanaka and Tanaka 1996: p170-171) spent 4 months in the US and 6 weeks in Japan recording conversations between salesmen and customers in the States and in Japan and compared them. He found that salesmen and customers made conversation in socially equal positions in the States. Both parties tended to use informal style and the length of their speech was almost the same. Consequently, it could be seen that they communicated person to person outside the social hierarchy. However, in Japan, conversations between the salesmen and the customers revealed the importance of social roles. For

example, the salesmen tended to use formal style and formal expressions, which the customers rarely used. This may be because Japanese people consciously consider that the hierarchical position between salesmen and customers should be clear and Japanese society can be described as hierarchical. It is vertical, rather than horizontal, and governs relationships between superiors (including customers) and their subordinates.

There is an interesting example about pitch variation in Japanese. According to (Okuyama 1972: p55-59), when Japanese people talk to other people who are in coordinate in rank with them, they do not change their pitch but do change some expressions. However, when they talk to people who are very important to them, they use a high pitch and rather weaker voice. In the opposite situation, they use a low pitch and a rather stronger voice.

The author points out that comic storytellers also vary their pitch to make the role clear so that the audience can receive more detailed information. He thinks that people tend to use high pitch and a weaker voice when they talk to their senior or boss. This might be because they put their voice nearer to that of the female voice. Japanese people regard modesty as good and that it is related to women's behaviour and the use of the honorific itself is very female. They also seem to make their speech soft-spoken and rather slow. Therefore, it can be seen that pitch plays a crucial role in defining and re-inforcing relationships and harmony within Japanese society.

The author concludes that the concept of politeness is becoming vague in Japan and politeness may be only shown by the peculiar

silky voice of people working in a department store. He calls it as a ‘business (commercial) honorific.’

2. Method

Aims

The aim of this experiment is to investigate whether a high pitch register is used systematically by younger speakers of English and Japanese in defined situations and to observe if a high pitch register relates to the situation, to age or to any cultural differences. It is generally assumed that a high pitch register is more prominent among younger people than among older people. In the case of Japan, this may be because more younger people work in the service business than older people, or because as people become older, they become more experienced and gain greater authority. On the other hand, it may be because younger people have opportunities to employ a greater range of pitches more than older people in their daily lives such as talking to their friends, teachers or in their work place. In contrast, older people tend to live more stable lives. Given these differences it is important for research purposes for the age range to be determined carefully so that the variables can be controlled as far as possible. In the case of the present experiment, the age range was set at subjects in their twenties.

Participants

Sixteen subjects took part in this research. Four female and four male native English speakers, and four female and four male native

Japanese speakers are recorded. Their ages ranged from twenty to twenty nine (average 24.75) with female speakers from between twenty to twenty nine (average 24.75) and male speakers from between twenty-two to twenty eight (average 24.5).

Table 1. Native speakers of English:

	Sex	Age	Occupation	Nationality / Where they grew up
1	Female	20	Undergraduate student	English / Guilford
2	Female	22	Undergraduate student / used to work in a shop	English / Cambridge
3	Female	24	Graduate student / used to work as an administrator	English / Cambridge
4	Female	28	Teacher / used to work in a supermarket	English / London
5	Male	23	Graduate student	Irish / Ireland (0 - 8.5), Oxford (8.5 - 18), London (18 - 23)
6	Male	25	Part time illustrator / bookseller	English / London
7	Male	22	Graduate student / used to work in a camping shop and supermarket	English / Exeter
8	Male	26	Graduate student / teacher / used to work in bars (formal and informal ones)	Scottish / Scotland

Table 2. Native speakers of Japanese:

	Sex	Age	Occupation	Nationality / Where they grew up
9	Female	25	Secretary	Japanese / Tokyo
10	Female	25	Secretary	Japanese / Tokyo
11	Female	25	Undergraduate student / office work	Japanese / Tokyo
12	Female	29	Office work	Japanese / Tokyo
13	Male	27	Working at a restaurant bar	Japanese / Tokyo
14	Male	21	Undergraduate student / working at a restaurant bar	Japanese / Tokyo
15	Male	25	Graduate student / used to work at a rental video shop and karaoke shop	Japanese / Tokyo
16	Male	28	Graduate student / used to work at a restaurant	Japanese / Tokyo

Table 3. Condition of recording place:

1	Her room
2	A recording room in Wolfson House in UCL
3	A recording room in Wolfson House in UCL
4	A room in SOAS
5	My room
6	My room
7	A room in SOAS
8	A room in SOAS
9	Her room
10	A meeting room in Japan Patent Office
11	A meeting room in Japan Patent Office
12	A meeting room in Japan Patent Office
13	The restaurant bar
14	The restaurant bar
15	My room
16	My room

Table 4. Role-play:

	Reading	Spontaneous speech	Talking to a customer	Talking to a client	Talking to his/her boss	Greeting on the phone
1	/				/	/
2	/	/	/			/
3	/	/		/		/
4	/	/	/			/
5	/	/	/			/
6	/	/		/		/
7	/	/	/			/
8	/	/	/			/
9	/	/		/		/
10		/		/		/
11	/			/		/
12		/		/		/
13	/		/			/
14	/		/			/
15	/	/	/			/
16	/	/			/	/

Subjects were recorded in the following situation:

Reading

- Time: English...around 50 seconds,
Japanese: shortest...44 seconds, longest...150 seconds
- Material: English...*Princess Bear* by Pauline Siewert (2000)
London: Templar publishing.
Japanese...*AERA No.16 15 April '02.*
Tokyo: Asahi Shinbunsha.
Drink menu at the restaurant bar *vif, ve.* Tokyo.

Spontaneous speech

Time: shortest...27 seconds, longest...190 seconds

Role-play: Serving customer / talking to client / talking to a boss

Time: shortest...10 seconds, longest...60 seconds

Greeting friends on the phone

The variables to be controlled would be the age, sex and where they grew up.

Apparatus:

A tape recorder (Marantz-CP230) with an external microphone (Eagle-G157B) was used to record subjects producing utterances.

Procedure:

The participants were chosen according to their age and the place where they grew up. The native Japanese speakers grew up in Tokyo and all but one of the native English speakers who grew up in southern England. All of the subjects were in their twenties. One native English participant had grown up in Scotland and used to work in two kinds of bar: one was formal and another was informal. They were asked to read passages or to make a spontaneous speech to the researcher about what they had done on

that day. The material used was a book “Princess Bear” which consists of five pages with two sentences on each page. This is considered as suitable material to obtain natural speech because it has no conversation and the passages in it are simple. The speakers of Japanese were required to read passages or to produce spontaneous speech but the female subjects tended to hesitate at having their speech recorded and it was therefore considered better for them to choose reading passages which were comfortable for them (such as an article in a magazine) or speaking spontaneously. These would be said with a ‘normal’ register which could act as a benchmark for the role-plays.

After having collected fifty-eight samples, the tape recorder was connected to the computer in the laboratory in Wolfson House in UCL. The recordings were processed using the computer system SFSWin programme which made it possible to analyse and display waveforms and spectrograms. SFSWin was also used to create estimates of the fundamental frequency (F_0) of the recorded speech. Annotations were made so that some poor quality parts of recordings could be removed to obtain more accurate averages of F_0 and it also made it possible to clarify what styles speakers were using which is shown on Appendix 1. This shows a sound wave, F_0 contour and annotations of speaker 8 in reading. ‘r’ indicates the starting point of the utterance and ‘1e’, ‘2e’ and ‘3e’ were made to remove poor quality parts or recordings. Then, F_0 distribution was calculated using a special sml script. The number of samples, the range of F_0 averages, the all values mean, and the trimmed mean were shown on a histogram. Appendix 2 shows the output of the sml analysis for speaker 5 in reading, role-play and greetings on the

phone. The columns on the right indicate the number of samples in each frequency band. The left three columns indicate the range of frequencies in each band. The trimmed mean makes it possible to exclude the highest and lowest frequency bands. Artifacts of the recording of the process were excluded from the trimmed mean. Appendix 3 and 4 show samples of what were obtained from a histogram. Appendix 3 shows a line graph of a speaker 2 in greetings on the phone and Appendix 4 shows a line graph of a speaker 9 in the corresponding styles. The calculated F_0 averages were: of each speaker in each style, of male speakers in each style, of female speakers in each style, of English male speakers in each style, of Japanese male speakers in each style, of English female speakers in each style, of Japanese female speakers in each style and finally, of a Scottish male speaker in two styles: in a formal and in an informal style.

3. Results

The Tables below show the trimmed mean (Hz) of the speeches depending on the style:

Table 1. Trimmed mean (Hz) of female speakers of English in each style:

	Role-play	Greetings on the phone	Conversation on the phone	Spontaneous speech	Reading
Speaker 1	189.6	261.6	216.3	—	191.2
Speaker 2	228.1	383.3	245.0	199.6	222.1
Speaker 3	186.9	254.6	187.2	175.3	186.3
Speaker 4	224.2	213.4	206.0	195.5	200.8

Table 2. Trimmed mean (Hz) of female speakers of Japanese in each style:

	Role-play	Greetings on the phone	Conversation on the phone	Spontaneous speech	Reading
Speaker 9	260.4	196.1	215.8	204.7	209.0
Speaker 10	225.3	214.5	200.4	172.2	–
Speaker 11	254.0	244.1	237.0	–	230.4
Speaker 12	248.3	264.9	234.7	189.8	–

Table 3. Trimmed mean (Hz) of male speakers of English in each style:

	Role-play	Greetings on the phone	Conversation on the phone	Spontaneous speech	Reading
Speaker 5	91.2	124.8	98.7	90.7	98.0
Speaker 6	102.0	116.8	106.5	94.5	96.2
Speaker 7	147.9	140.1	134.1	130.4	121.2
Speaker 8	143.2	162.2	151.5	133.3	139.1

Table 4. Trimmed mean (Hz) of male speakers of Japanese in each style:

	Role-play	Greetings on the phone	Conversation on the phone	Spontaneous speech	Reading
Speaker 13	123.9	95.4	-	–	93.8
Speaker 14	115.1	104.1	106.3	–	106.7
Speaker 15	117.3	153.6	106.1	97.3	114.8
Speaker 16	110.8	147.3	111.6	101.1	124.4

Comparison of English and Japanese

Table 5. Average trimmed mean (Hz) of female speakers of English and Japanese:

	English	Japanese
Role-play	204.6	249.9
Greetings on the phone	270.8	235.3
Conversation on the phone	207.5	225.8
Spontaneous speech	193.3	201.5
Reading	202.6	218.2

Table 6. Average trimmed mean (Hz) of male speakers of English and Japanese:

	English	Japanese
Role-play	119.1	117.6
Greetings on the phone	139.5	116.4
Conversation on the phone	121.2	110.4
Spontaneous speech	116.3	98.8
Reading	124.3	112.2

Comparison of Female and Male

Table 7. Average trimmed mean (Hz) of female and male speakers of English:

	Female	Male
Role-play	204.6	119.1
Greetings on the phone	270.8	139.5
Conversation on the phone	207.5	121.2
Spontaneous speech	193.3	116.3
Reading	202.6	124.3

Table 8. Average trimmed mean of female and male speakers of Japanese:

	Female	Male
Role-play	249.9	117.6
Greetings on the phone	235.3	116.4
Conversation on the phone	225.8	110.4
Spontaneous speech	201.5	98.8
Reading	218.2	112.2

Comparison of style

Table 9. Speaker 8 in a formal style and in an informal style:

Style	Trimmed mean (Hz)
Formal	148.3
Informal	138.8

4. Discussion

Pitch difference depending on style and on sex was analysed and it was discovered that the use of a high pitch register was different between the female speakers of English and the female speakers of Japanese. Tables 1 and 2 show that both use a high pitch register in a particular style even though they are not all consistent in this usage.

Female speakers of English used a remarkably high pitch register for greetings on the phone. Only speaker 4 used higher pitch for role-playing in which she pretended to talk to a customer in the supermarket. She used relatively high pitch for greetings on the phone but it was lower than that in role-playing. Speaker 1 used low pitch for role-playing in which she pretended to talk to her boss. Speaker 2 used rather lower pitch for role-playing in which she pretended to talk to her client although it was higher than her spontaneous speech.

Female speakers of Japanese, on the other hand, tended to use high pitch register for role-playing. Although speaker 12 used higher pitch for greetings on the phone than in role-playing in which she pretended to talk to her client, her pitch for role-playing was higher than that of her spontaneous speech. Speaker 9 used quite high pitch for role-playing in which she pretended to talk to her client, although, interestingly, her pitch for greetings on the phone was quite low. Apart from her, speakers used higher pitch for greetings on the phone than for their spontaneous speech or reading.

The average trimmed mean of female speakers of English and

Japanese are summed up in Table 5. It shows clearly that female speakers of English use a high pitch register for greetings on the phone and female speakers of Japanese use it for role-playing.

Table 3 shows that male speakers of English tend to use a high pitch register for greetings on the phone as well as female speakers of English. They were considerably higher compared with their pitch for spontaneous speech. All the speakers pretended to talk to a customer in role-playing. Apart from speaker 7, speakers used higher pitch for greetings on the phone than for role-playing although their pitch for role-playing was higher than that for their spontaneous speech.

Speaker 8 used to work in two kinds of bar: a formal and an informal one. He noted the way of talking with customers differed between the two bars and therefore he did the role-playing in both styles. The results are shown in Table 9. His pitch in both styles is lower than in greetings on the phone but there is an obvious difference in his pitch. His pitch in informal style seems to be closer to that of normal register.

The results of the male speakers of Japanese were rather ambiguous. Speakers 13 and 14 used higher pitches for role-playing in which they pretended to talk to their customer (they actually work in a restaurant bar which is neither very formal nor very informal) than for greetings on the phone. On the other hand, Speakers 15 and 16 used higher pitch for greetings on the phone than that for role-playing although their pitch for role-playing was higher than for their spontaneous speech. Speaker 15 pretended to talk to a customer, and speaker 16 pretended to talk to his boss.

Table 6 shows the average F_0 of the male speakers of English

and Japanese in each style. From this Table it was discovered that the use of a high pitch register for greetings on the phone by male speakers of English was more remarkable than that of male speakers of Japanese. Concerning male speakers of Japanese, there is not much difference in pitch between role-playing and greetings on the phone. It was also seen that the average F_0 of male speakers of English tended to be higher than that of male speakers of Japanese which is contrary to the results between female speakers of English and Japanese.

Table 7 shows that both female and male speakers of English use a high pitch register for greetings on the phone. The pitch range of female speakers of English is very wide. Their highest F_0 is 270.8 Hz (greetings on the phone) and their lowest one is 193.3 Hz (spontaneous speech). The difference between them is 77.5 Hz which is considered to be a wide variation. The pitch difference of male speakers of English is 23.2 Hz; the highest F_0 is 139.5 Hz (greetings on the phone) and the lowest one is 116.3 Hz (spontaneous speech).

Tables 7 and 8 show that the use of a high register depended on a cultural difference rather than a sex difference. Both female and male speakers of English tended to use a high pitch register for greetings on the phone whereas both female and male speakers of Japanese tended to use it for role-playing which can be seen on Appendix 5 and 6. Concerning role-playing, however, both English and Japanese speakers tended to use a high pitch register when they talked to a customer, but not when they talked to their boss.

5. Conclusion

What does the use of a high pitch register relate to? From this experiment, it was observed that native speakers of English tend to use a high pitch register when they greet their friend on the phone, on the other hand, native speakers of Japanese tend to use a high pitch register when they talk to their client or customer. Neither native speakers of English nor Japanese used a high pitch register when they talked to their boss, although the results can only be tentative because only two examples of this were obtained in this experiment. Some native speakers of English who participated in the experiment said that they regarded the use of a high pitch register as a mark of friendliness. That may explain why they tend to use a high pitch register when they talk to a customer but not when they talk to their boss. They also said low pitch carried more authority or was more formal. Some of the subjects did not like to be talked to in high pitch because they felt it was like to being treated as a child.

Native female speakers of Japanese tend to use a high pitch register when they talk to their clients but it was hard for them to pretend in role-playing. They said they did not know exactly how they talked to a client if they were not in that situation. On the other hand, it was not difficult for female speakers of English to do the role-playing which might be because there is not much pitch difference between spontaneous speech and role-playing of female speakers of English. However, female speakers of Japanese might know they talked to their clients differently from their spontaneous speech and it made it difficult for them to reproduce it when they

were not in that situation. The results are likely to be different with older generations who have much more experience than younger generations, because they might know how to talk to their clients and why they talk like that. Data concerning when they talk to a customer or to their boss was not obtained from the experiment, but it is likely that the same register would be found in those situation as well. Women generally tend to use high pitch, but it is supposed that Japanese women in particular are expected to use high pitch in Japanese society. It was assumed that male speakers of Japanese also tended to use a similar high pitch register in the same situations as the female speakers of Japanese but the results of this experiment do not confirm this to be the case. The pitch range of male speakers of Japanese was very narrow and this finding is supported by an experiment carried out by Ohara (1993) which showed that female speakers of Japanese use higher pitch when they speak in Japanese than when they speak in English whereas male speakers of Japanese do not change their pitch very much according to the language. It is assumed the reason for this is that women are expected to use high pitch in Japanese society but not in English-speaking society. Men, on the other hand, are not expected to use high pitch in Japanese society and consequently they use similar pitch both in English and in Japanese.

The use of low pitch generally seems to be associated with 'masculine', 'authority', 'seriousness' or 'formality' in English. The same thing can be said regarding the terms 'masculine' and 'authority' in Japanese. However, it is doubtful whether Japanese women use low pitch relating to 'formality'. It is more reasonable to think that they use high pitch in a formal situation, because they

are expected to use it as women in the society.

The use of a high pitch register seems to be associated with 'friendliness' in English. That may be why native speakers of English tend to use a high pitch register when they talk to their friend or a customer and not when they talk to their boss or probably not when they talk to a customer in a 'posh' shop. They use a high pitch register to shorten the distance. On the other hand, the use of a high pitch register seems to be associated with 'politeness' or 'deference' in Japanese, because they do not tend to use a high pitch register when they talk to their friends. They use a high pitch register rather to keep a distance. The use of a high pitch register can also be a business strategy to create a good impression to a client or a customer. It may be reasonable to assume so because native speakers of Japanese tend not to use a high pitch register when they talk to their friends.

The experiment of this study is insufficient to prove the relation between a high pitch register and other factors. However, it should be emphasised that this research has indicated that a high pitch register is used in a different style between native speakers of English and Japanese. To obtain more extensive evidence concerning the relation between high pitch register and other factors, a more detailed examination will be needed.

Therefore, it can be seen that pitch is a very important part of intonation and has a direct effect on the meanings which are encoded in language. Clearly, the appropriacy of pitch and intonation plays a critical role in maintaining smooth and harmonious relations within societies and therefore further research into the role which pitch plays in human communication is of

particular importance.

Bibliography

- Ben-Ari, E., Morean, B. Valentine, J. eds. (1990) *Unwrapping Japan*. Manchester: Manchester University Press.
- Clark, John and Yallop, Collin. (1995) *An Introduction to Phonetics and Phonology*. 2nd ed. London: Blackwell.
- Cruttenden Alan. revsd. (2001) *Gimson's Pronunciation of English* 6th ed. London: Arnold.
- Hart, John. (1990) *A perceptual study of intonation: an experimental-phonetic approach to speech melody*. — *Cambridge studies in speech science and communication*. Cambridge: Cambridge University Press.
- Hendry, Joy. (1993) *Wrapping culture: politeness, presentation, and power in Japan and other societies*. Oxford: Oxford University Press.
- Horvat, Andrew. (2000) *Total quality Japanese: Women Come Down from the Honourable Second Floor*.
<http://www.cic.sfu.ca/tqj/GettingRight/invitation.htm> 06/08/02
- Jones, Daniel. (1960) *An outline of English phonetics*. 9th ed. Leipzig: Teubner. 3rd and subsequent editions: Cambridge: Heffer.
- O'Connor, J.D. and Arnold, G.F. (1973) *Intonation of Colloquial English* 2nd ed. London: Longman.
- Ohara, Yumiko. (1993) in *Nihongogaku*. Vol.12 Tokyo: Meiji shoin.
- Okuyama, Masuro. (1972) *Japanese and honorifics*. Tokyo: Tokyodo shuppan.
- Romaine, Suzanne. (2000) *Language in Society*. — *An introduction to Sociolinguistics*. (2nd ed.) Oxford: Oxford University Press. (1st ed. published 1994)
- Sifianou, Maria. (1992) *Politeness phenomena in England and Greece: across-cultural perspective*. Oxford: Oxford University Press.

- Tanaka, Harumi and Tanaka Sachiko eds. (1996) *An invitation to sociolinguistics*. Kyoto: Minerva shobo.
- Tsujimura, Natsuko ed. (1999). *The handbook of Japanese linguistics*. Oxford: Blackwell.