Some Problems with Word-linking in the English of Japanese Learners

Margaret Maeda

Learning to link words is an important part of acquiring fluency in English, and learning how words are linked is essential for developing listening ability. Sixty-five students from the Kanto area were recording reading scripts with five edited news stories. As other writers have noted (Celce-Murcia, 1996 ; Melenca, 2001), the use of glottal stops before word-initial vowels was found to be the most frequent and salient problem with word-linking. The second most frequent problem was over-conspicuous releasing of word-final plosives before another consonant. Reasons for over use of glottal stop and released plosives were proposed, and recommendations were made for the teaching of word-linking generally.

Key words : glottal stop, consonant cluster, assimilation, epenthesis, linking r

Introduction

The syllable structure of English is particularly complex. Maddieson (2009) classifies the syllable structure of English with 150 other languages as “complex,” and that of Japanese with 273 other languages as “moderately complex.” Sixty-one languages are reported to have “simple” syllable structures. English allows up to three consonants in the onset of a syllable and up to four in the coda. This means that the sequences of consonants which can occur together at word boundaries are even more complex. The syllable structure of Japanese is much

simpler. It allows a maximum of only one consonant with one approximant [j] in the onset, and only the uvular nasal [N] in the coda.

Learners in a foreign-language setting start by learning isolate words, and by the time Japanese learners of English reach university, it appears that they have been taught little or nothing about how words are linked in English, and about the modifications which occur at word boundaries. The fluency, rhythm (Roach, 2000) and overall impression of pronunciation proficiency are affected by lack of word linking. Writers on the pronunciation of English have noted that problems with word-linking cause irritation for the listener (Melenca, 2001). Roach (2000 : 147) writes : "An essential part of acquiring fluency in English is learning to produce connected speech without gaps between words." Cruttenden (2008) writes that learners should make proper use of liaison, and avoid an excessive use of pre-vocalic glottal stops. Brown (1977) believes, however, that we should not expect learners to produce all the reductions that native speakers use.

Successful word-linking is probably not essential for the intelligibility of learners' English, but they will have to be familiar with reductions to understand spoken English (Brown, 1977). Brown points out that learners need to have an awareness of the changes that take place at word boundaries, not only in fast casual speech, but even in the more careful speech of television news or academic lectures, because there are many modifications in these contexts, too.

This study was originally carried out to investigate other aspects of Japanese learners' pronunciation (Maeda, 2009), but one of the judges in that study, and the author of this one, noted the importance of word-linking to the overall impression of learners' pronunciation proficiency. The present study was carried out to ascertain which features of students' word-linking caused the most frequent and noticeable problems, to try to deduce the causes of the problems, and to draw conclusions about how to teach word-linking.

Method

Subjects

The subjects were 65 students from two universities in the Kanto Area, 17 from one university and 48 from the other. All the 17 students from one university had spent from no time to two months in English-speaking countries. They were nearly all majoring in English. Of the 48 students from the other university, 21 had spent from no time to one month in English-speaking countries. They were undergraduates, nearly all majoring in English. There were nine Masters of Arts students, aged from mid twenties to early fifties, who had had a variety of experience in English-speaking countries, ranging from none to five years. Five undergraduate students had spent a year in US high schools as exchange students staying with local families at around age 17. Thirteen undergraduates had lived in the US or Britain with their families for between one and five years between the ages of 5 and 13. In return for taking part in the study, the students were given feedback on their pronunciation and a small payment.

Five native-speaking teachers of English, two from the United States, two from Britain, and one from New Zealand, were recorded reading the five news stories. They were used as controls.

Materials

The students were given five short news stories adapted from newspapers and the Internet (see Appendix) about two weeks before they were recorded and were asked to prepare the reading. The texts were not edited to include particular features of connected speech. The students were interviewed after the recording so that their unprepared speech could be compared with the readings. Both the readings and the interviews were recorded in a soundproof studio.

Read speech is often considered to be unsatisfactory as experimental material on the natural speech of native speakers. However, in the case of learners, the two experimental conditions of read and spontaneous speech do not involve parallel problems. For lower level learners, neither

reading nor unscripted speech are natural activities. Read speech may better approximate the conditions of natural speech by native speakers because the learners are relieved of the burden of worrying about correct grammar, choice of vocabulary and expressions. They may speak more fluently with a script than in unscripted conversation. As Melenca (2001) found, less proficient speakers may barely be able to speak at all in an unprepared interview. Without a script, of course, pronunciation of the same features cannot easily be compared across subjects.

Some students spoke better in free conversation – more advanced students were more relaxed. Some lower level students' speech was worse in the unprepared interview. Some were about the same in both conditions. Particular features of word-linking were checked against the students' pronunciation in the interviews. Striking differences were not found, and the results are not reported here.

Judges

Overall impression of the pronunciation of the students' reading of the texts was evaluated by three teachers of English from the two universities, all with training in phonetics. They were the author, a speaker of RP, a speaker of GA, and a Japanese national who had spent several years in Australia and the US during childhood and who is a phonetician. They rated the students on a scale of 1 to 5. They were not asked to pay special attention to features of connected speech, although one of the judges did so (the phonetician).

Results

Linking of final consonants to initial vowels

This would seem at first sight to be the simplest type of word-linking, but over-use of glottal stops before vowels is the most conspicuous and frequent kind of lack of word-linking in the speech of Japanese (and other) speakers. It has been reported as giving an irritating impression of staccato, choppy speech (Celce-Murcia, 1996 ; Melenca, 2001).

Glottal stops

Glottal stop is represented by the IPA symbol [ʔ]. The vocal folds are held tightly together, and there is a build up of energy behind them. Phonation starts abruptly when the vocal folds open. The release is heard as a small plosive sound. Glottal stops are heard as small gaps in sound, giving the choppy impression. Sometimes the glottal closure is not complete and there is a creak instead. Ladefoged & Maddieson (1996) consider this to be a variant of glottal stop. Creaks were counted with glottal stops in this study.

Frequent use by English native-speakers of glottal stops is characteristic of over-careful, prepared and read speech. Glottal stops are sometimes used by native speakers for prosodic purposes to demarcate intonation phrases and to mark stressed words. Some speakers make frequent use of glottal stops to separate words which end in consonants or vowels from following words which begin with vowels, and some speakers use them instead of linking r.

The five English native-speaking controls who recorded the news stories for this study pronounced totals of 3, 4, 7, 8, and 19 glottal stops. The speaker who had 19 glottal stops sounded natural and not over-careful. The five speakers used glottal stops only before intonation phrases or stressed words (except in one place).

In order to study excessive use of glottal stop by the students, glottal stops pronounced at the beginnings of sentences, phrases, or words which might reasonably be stressed, were not counted.

The number of glottal stops pronounced by the students was compared with the general evaluations of their pronunciation made by the three judges (see Table 1). Each gave a score of from 1 (low) to 5 (high). The scores from the three judges were averaged for each student to the nearest half mark.

The students had a wide range of totals of glottal stops, whether their scores for pronunciation were low or high (see Table 1). There were students who scored less than 3 who pronounced no or few glottal stops between words, and some with scores of 4 who pronounced 30 or more.

Table 1 Number of Glottal Stops Compared with General Pronunciation Scores

Pronunciation Scores	No. of Students	Average no. of gs	Range
1.0 – 2.5	14	28.79	6 – 52
3.0	16	24.56	0 – 55
3.5 – 4.0	21	21.57	3 – 49
4.5 – 5.0	14	13.71	2 – 27
NS	5	8.20	3 – 19

Note. gs=glottal stop

The judges were asked to judge overall pronunciation proficiency and were not asked to pay particular attention to word-linking. The table does, however, show a tendency for more proficient speakers to have smaller totals of glottal stops, and for less proficient speakers to have larger totals. Students who had lived abroad for more than a year pronounced noticeably fewer glottal stops than students who had lived abroad for less than a year. Of the students who scored the highest for pronunciation (4.5 and 5), all but one had lived abroad for more than a year. They had totals of glottal stops which were higher, but not much higher, than those of the native-speaking controls.

There was a total of 71 places in the recordings of the five news stories where students used glottal stops before vowels (not including before sentences, phrases or stressed words). A few students pronounced glottal stops before nearly every vowel. There were,

Table 2 Word Pairs Less Frequently Separated by Glottal Stop

	No. of occurrences	No. of gs
sort of	1	5
years ago	1	2
in a	3	1
some of	1	3
here's a	1	2
it's a	1	1

however, pairs of words which were almost always linked (Table 2). These seemed to be frequently-heard pairs which students had learned to pronounce as units rather than as isolate words.

The pair "in a" had a high correct rate. Japanese has only one syllable-final consonant /N/ or ん. A common Japanese error is to pronounce /n/ in English as a uvular nasal with weak or no closure (Vance, 1987 : 34), but in this pair, it was mostly pronounced as an English /n/, possibly because students have heard "in a" frequently and have learned it as a unit. "When I" occurred three times and was separated by glottal stop 24 times. The higher number of glottal stops may have been because learners typically stress personal pronouns, not only by means of extra pitch prominence and duration (Maeda, 1994), but also by using glottal stop.

The pairs in Table 3 have adjacent vowels or approximants in different combinations.

Table 3 Linking Between Vowels and Approximants

	No. of occurrences	No. of gs
be able	1	22
to it	1	11
full of	1	13
twenty years	2	29
the year	1	39

In "be able," students may have used a glottal stop to stress "able." Native speakers may use a glottal stop before a content word like "able" in careful speech, but none of the native speakers did. There were fewer glottal stops in "to it," perhaps because "it" is an unstressed word. Students may have had difficulty linking the pair "full of" because of the /l/. Three students pronounced the /l/ like a [w], which is a native-speaker speaker variant in word-final position, but not when linked to a following vowel. The phoneme /j/ is difficult for Japanese speakers before the similar sound /ɪ/. The pair "twenty years" seems to have

been easier than “the year,” even though [j] only occurs before back vowels in Japanese (Vance, 1987 : 26). The expressions “twenty, thirty years” etc. may be learnt as pairs.

Table 4　Word Pairs Frequently Separated by Glottal Stop

Word pairs	No. of occurrences	No. of gs
versions of	1	35
doing in (England)	1	33
danced in (a circle)	1	36
worked in (a pub)	1	26
thought I	1	48
chest infection	1	25
worst experience	1	15
worst it’s (been)	1	47

The pair “worked in” had a high rate of glottal stop although it is a frequent pair. Students may have started a new prepositional phrase in all the three pairs with “in” – “in a pub,” “in England,” and “in a circle.” This may be a case of non-native speakers using shorter phrasing than native speakers. One native speaker marked the start of the prepositional phrase “in a circle” with a glottal stop.

A surprising pair which students frequently separated by glottal stop was “thought I.” Some students’ timing and intonation suggested that they erroneously treated “I” as the start of reported speech, perhaps an example of erroneous phrasing marked by glottal stop. Others may have used glottal stop because “I” is a subject pronoun, and some simply because they put glottal stops before nearly every vowel.

The expressions “chest infection” and “worst experience” had low rates of glottal stop, considering that the phrases are not easy to pronounce. One reason may be that they consist of an adjective followed by a noun, so the students may recognize them as closely linked pairs. The three pairs “chest infection,” “worst experience,” and “worst it’s” all have word-final /t/ followed by /ɪ/. Based on the phonemes alone,

word-linking difficulty would seem to be the same. The higher rate of glottal stop in the first pair may have been spelling-influenced. It may be easier for students to pronounce "te" than "ti" because of the influence of Japanese phonology. More students used glottal stop in "worst it's" than in the two adjective-noun pairs. Higher pitch on "it's" by some of the students suggested that "it's" was pronounced as the start of a new phrase, perhaps because "it's" often occurs phrase initially. One native speaker had a glottal stop before "it's." This was possibly a break in the reading a long piece of text, or a pause after "worst" in order to stress it.

Table 5 Linking r Replaced by Glottal Stop

	No. of occurrences	No. of gs
for up	1	46
hear a	1	30
hour of	2	72
year of	1	37
were introduced	1	41

The number of glottal stops pronounced instead of /r/ at the end of a word was high, but not much higher than the number of glottal stops in some other word pairs (see Table 4). However, some were frequent pairs, such as "hear a" and "hour of." Native speakers frequently avoid linking word-final /r/ to a following vowel. Cruttenden (2008 : 305) mentions this tendency as a kind of native-speaker hyper-correction of "intrusive" /r/. "Intrusive" /r/ is the pronunciation of an "r" in pairs such as "saw it" where there is no "r" in the spelling. Native speakers replace the /r/ with a glottal stop or with a glide between two vowel sounds, even where there is an "r" in the spelling. This feature can be heard in English teaching tapes as well as in careful speech, so students are likely to have been exposed to it. The well-known difficulty with the pronunciation of /r/ may also contribute to a high rate of glottal stop in place of linking r.

Summary of Glottal Stop before Word-Initial Vowels

Learners tend to have shorter phrases and as a consequence use glottal stops more frequently than native speakers to divide their speech into phrases. The students used them more frequently than the native speaker controls to mark the start of short prepositional phrases. As well as correct but short phrasing, students also had erroneous phrasing marked by glottal stop. They also used glottal stops to stress words which native speakers usually do not stress, such as the subject pronoun "I." Some students who frequently pronounced post-vocalic r did not use linking r, for example in "were introduced" and "for up." Instead, they used a glottal stop before the vowel. It was noticeable that some pairs of words, the second starting with a vowel, were more frequently successfully linked. These were very common pairs such as "in a," "it's a," and "here's a." Students had obviously learnt to hear and produce them as units.

Linking of consonants

Sequences of sounds at word boundaries which caused problems were examined, and where possible, the same sequences of phonemes between other words were compared to see if they always caused difficulties.

Plosives

The most common consonants which caused problems were /t/ and /d/, with similar problems occurring with other plosives. Shockey (2003 : 14) writes : "the more common an item is, the more likely it is to reduce." According to her Vulnerability Hierarchy, /t/ is very prone to change, and /d/, moderately so. In casual speech, the closure for a word-final plosive is held through the following word-initial plosive. When there was a conspicuous release after both plosives, the link sounded disfluent. If the release was small, it sounded similar to the pronunciation of over-careful native speakers. Some students had pauses between words that were difficult to link which sounded like

legitimate pauses or breaks, but which always occurred at difficult junctures where the native speaker controls never had breaks. These pauses were possibly a strategy to deal with difficult links. Other students stumbled over whole words before or after difficult junctures.

Pairs of words where /t/ and /d/ occurred before another /t/ or /d/ were: "set to," "that tune," "different tunes," "left dogs," "prevented dogs," "should do," "guide to," "hard to" and "need to." Pairs with /t/ or /d/ followed by other plosives were "not be," "bad cough," and "could be." Two other plosives occurring together were /p/ and /b/ in "pump blood."

Error rates for links were divided arbitrarily into High 15–20, Medium 8–13, and Low 0–6.

Table 6 Linking of Word-Final and Word-Initial Plosives

Adjacent plosives	Word pairs	Error rates		
		High	Medium	Low
/t/+/t/	set to			1
	that tune			3
	different tunes		10	
/d/+/d/	should do			4
	prevented dogs	19		
/d/+/t/	need to			5
	guide to	17		
	hard to	16		
/t/+/d/	left dogs	18		
/t/+/b/	not be			4
/d/+/b/	could be	20		
/d/+/k/	bad cough			6
/p/+/b/	pump blood		9	

t+t

The two /t/s in "set to" and "that tune" have vowels before and after them, and linked /t/s are similar to Japanese geminated /t/. This fact

may account for the low error rate, even though the word-pairs are not as commonly occurring as “need to” or “should do.” In “different,” there is /n/ before word-final /t/. Japanese does not have consonant clusters word-finally. Consonant clusters contributed to difficulty in word-linking.

d+d

“Should do” is a frequently occurring pair and the link was mostly successfully pronounced. Errors with “prevented dogs” included 16 word-final /d/ released rather than linked to the next /d/, with the students pronouncing two released /d/ in rapid succession. “Prevented” was pronounced as “pretend” once, and “prevent” instead of “prevented” twice.

d+t

“Need to” is a frequently occurring pair while “guide to” is less frequent. “Hard to” may be as common as “need to,” so familiarity may not explain lack of linking. Students may have made a phrase boundary between “hard” and “to pump blood.”

t+d

The word-final consonant cluster in “left dogs” includes /f/, which is difficult for Japanese speakers, the word-pair is not particularly frequent and the error rate was high. One student replaced both /f/ and /t/ with one glottal stop instead of assimilating the /t/ to the /d/.

/t/+/b/ and /d/+/b/

Although “not be” and “could be” are both frequent pairs, there was a big difference in error rates. It seems that assimilating /t/ to /b/ was easier than assimilating /d/ to /b/. Two students dropped /t/ completely so that “not be” sounded like /nɒbi or /nɑbi/. Native speakers do this in fast casual speech, so they were not counted as errors, but there was an impression of mismatch between the students’

level of fluency and this feature of fast casual speech.

/d/+/k/

There was a total of 21 releases of /d/ in "bad cough," but 15 sounded acceptable for careful speech. Native speakers are more likely to pronounce "bad cough" carefully than "could be" because both words may be stressed. Among the six errors with "could be," there were three epenthetic schwa-like vowel sounds.

Comparing the students' pronunciation of "bad cough" and "bad chest (infection)," released /d/ sounded less acceptable in "bad chest," so the apparent error rate was higher than for "bad cough." There were 13 released /d/ in "bad chest" which were counted as errors, including three with epenthetic schwa, and no releases were counted as acceptable. In "bad cough," six released /d/ were counted as errors and 15 as acceptable. Native speakers are less likely to release the /d/ in "bad chest," even in careful speech, because the place of articulation of /ʧ/ is close to that of /d/ and the release of the closure for /d/ normally takes place through the second part of the affricate.

/p/+/b/

The overall impression was that this link was well pronounced. Three of the consonants have the same (labial) place of articulation, probably making the consonant cluster easier.

Plosives followed by nasals

/t/ was followed by nasal stops in "It may," "but man's," "might not," and "doesn't need."

All these pairs are frequent. Probably the main reason for differences in error rates was ease of articulation, /t/ and /n/ both being alveolar consonants while /m/ is bilabial. There were more errors in "doesn't need" than "might not," probably because there are three consonants involved rather than two. Two errors with "doesn't need" consisted of

Table 7　Linking of /t/ and Nasals

Adjacent /t/ and nasals	Word pairs	Error rates		
		High	Medium	Low
/t/+/n/	might not			2
	doesn't need		9	
/t/+/m/	It may	17		
	but man's	16		

dropping the wrong consonants. Two students said "does need" and one said "doest need." The other six errors were released /t/. In "It may," three students pronounced epenthetic vowel sounds, and one student in "but man's." One of the native speaker controls had a small release in "It may."

Ten students completely dropped /t/ before the nasals without a held closure, producing "mi' not" for "might not," and "I' may" for "It may." Native speakers do this in fast casual speech. Although there was a mismatch between this feature of fast casual speech and the less fluent, slower speech of the students, this pronunciation was not counted as an error.

Links involving fricatives

The pairs involved are listed in Table 8.

The release for the closure of /t/ normally occurs through /s/. Fast casual speakers may have no closure for the /t/ and pronounce "it stays" like "istays." Eight students and one of the native speaker controls did this. It was not counted as an error, although it did not always sound natural in the students' speech, as mentioned in similar cases above.

The pair "heart stronger," which occurred twice, was difficult because of the number of consonants including /r/. In the first instance of "heart stronger," 24 of the students released the first /t/. Twelve of these releases were counted as small enough to be acceptable. One native speaker control released the /t/. The second time, 20 students released

Table 8

Adjacent /t/ and fricatives	Word pairs	Error rates		
		High	Medium	Low
/t/+/s/	it stays		11	
	heart stronger		12	
	heart stronger		8	
/s/+/s/	dances set	15		
	has seen		9	
	was so			2
/s/+/ð/	What's that		13	
/z/+/ð/	is the			6
/z/+/ð/	find that		8	

the /t/ with eight pronunciations counted as errors because of a strong release or an epenthetic vowel.

Fifteen of the 65 students pronounced the two "s" in "dances set" separately as /s/ followed by another /s/ with a small gap between the two sounds rather than as one lengthened [s :] or one /s/ only. The plural "s" in this environment is transcribed as /z/, but utterance-finally, it is partially or completely devoiced. One of the native speakers pronounced two /s/ with a small pause between them. His pronunciation sounded careful but not unnatural, and in reading, if phrases are very short, a reader might choose to start a new phrase before "set."

Nine students did not link "has seen." Here, there was no possibility of a phrase break. The same native speaker also pronounced two /s/. Seven students said, "has been." It is possible that students were distracted by the less frequent meaning of "has seen" meaning "has experienced" in this context. Nearly all the students linked "was so," as did all the native speakers, probably because this is a high frequency pair.

Thirteen students completely omitted the /s/ in "What's that." Although the error rate was neither high nor low, omission of the /s/, which is not normally reduced and should have a much longer duration

than /ð/, was a more conspicuous error than released plosives or repeated /s/. Since /ð/ is a difficult phoneme, it is possible that students concentrate too much on pronouncing this word-initial consonant and as a result, omit the preceding word-final consonant.

The error rate – or possibly the apparent error rate – for "is the" was low. The six who made conspicuous errors reduced the wrong sound in a similar way to those who dropped /s/ in "What's that," pronouncing the pair /ɪðə/. Other students pronounced the pair /ɪzː ə/ or /ɪzə/, but this is a kind of reduction that native speakers make. Hence the reason for this pronunciation could be either that they have heard the pair pronounced like this frequently, or that they pronounce /ð/ with the [z] that Japanese speakers frequently replace /ð/ with. Pronunciation with [z] or [zː] was counted as correct.

In "find that," /d/ was released by eight students. No native speaker controls released it. If some students omitted the word-final /d/ because they were concentrating on the following /ð/, omitting the /d/ worked well in this case.

Summary of linking of consonants

In some cases, there were conspicuously different error rates for the same phonemes between different pairs of words, as was also seen in the case of linking consonants to following vowels. Factors which appeared to be the cause of different error rates in linking consonants were the following :

1. Words commonly occurring together, for example "need to," were more successfully linked.
2. The one closure for two /t/s with vowels before and after was more successfully held than for other plosives. This may be because there is geminated /t/ in Japanese.
3. Less familiar words or words which were more difficult to pronounce had more errors in linking with other words, for example the less familiar "prevented" in "prevented dogs."

4. Where final and/or initial consonants were part of consonant clusters, the words were less successfully linked.
5. The students' phrases were shorter than those of the native speaker controls. Some of the phrases were legitimate short phrases, for example "to pump blood" after "hard" and some of the native speaker controls had short phrases, but they had fewer than the students.

Some other strategies used by students

Some students omitted many final consonants, perhaps as a result of hearing native speakers do so, or perhaps as a strategy to deal with difficult word links. Two students pronounced the "d" of "hundred" in "hundred years" as a glottal stop instead of pronouncing the link as /dj/ or /ʧ/. A few students used natural-sounding pauses, but always at difficult word junctures.

Teaching of word-linking

Most textbooks which teach word-linking concentrate on linking consonants to vowels, and reduction of /t/ and /d/. Some deal with a wider range of links (Hewings, 1993). Books on pronunciation for teachers and very advanced learners deal with word-linking in more detail (Celce-Murcia, 1996 ; Kreidler, 1989).

The concept of linking a consonant to a following vowel is easy to teach, but difficult for students to put into practice before reaching a certain level of fluency because they have to be able to produce longer utterances fluently. The same goes for the concept of joined /s/ and geminated /t/ instead of the repetition of two sounds. They can easily be practiced in class, and it is useful for students to learn that native speakers do not pronounce complex consonant clusters simply by producing them quickly in succession but by modifying them by processes such as assimilation and reduction. Other features, such as the timing of held consonants across words boundaries, are more difficult or perhaps impossible to teach students to produce, and may have to be

left to the students to develop through extensive exposure.

It seemed that students had acquired some links unconsciously from listening, since commonly heard word pairs were well pronounced, whereas links between the same phonemes occurring together in different contexts were not well pronounced. This showed how important input from recorded teaching materials is for students who cannot spend long periods in English-speaking countries. It is important that recorded teaching materials provide students with input that has as much natural word-linking as possible. Some speakers on teaching tapes remove most links from their speech, for example pronouncing two /t/s in succession at word boundaries, a link which is easier for students to acquire than some other links, removing a valuable opportunity for students to hear word-linking. It has been claimed that word-linking may be difficult to acquire if not explicitly taught (Melenca, 2001). However, it seemed from this study that students had acquired some links, almost certainly without being explicitly taught, and that both ways of learning, by extensive input and by explicit teaching are needed to improve word-linking.

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Appendix

Script of Five News Stories Recorded for the Study

What sort of dances were they doing in England two hundred years ago? The main dances were the country dance and the reel. The same dance could be done to many different tunes and one tune could have many different dances set to it. Ten or twenty years later, new versions of the country dance were introduced. In some of them, there were fewer couples, and they danced in a circle.

My name is Ann Martin. I'm an opera singer. When I became an opera singer, I gave up going out because of cigarette smoke. Smoky atmospheres can make me unable to sing for up to a week. When I was a student, I worked in a pub. There was so much smoke that I got a bad cough and left the job.

The worst experience I had was when I flew from China to India. The plane was full of smokers and I got a bad chest infection. I thought I might not be able to continue to sing opera.

Do you ever find that you hear a tune in a commercial and it stays in your head all day? Here's a new service called "What's that tune?" It's a guide to music in TV commercials.

Everyone should do thirty minutes of exercise per day. Half an hour of fast walking makes your heart stronger and helps you to live longer. A stronger heart doesn't need to work so hard to pump blood. Even half an hour of housework or gardening will make your heart stronger.

It may be the Year of the Dog but man's best friend has seen better days. A bitter winter has left dogs suffering indoors. The snow has prevented dogs from going for walks and they are suffering mentally. The snow this winter is the worst it's been for twenty years.