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Other Contributor(s)	University of Hong Kong.
Author(s)	Lo, Yuen-ting, Cynthia
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**Perception of Voice Problems between Treatment-seeking Dysphonic Teachers
and Non-teachers**

Lo, Yuen Ting Cynthia

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Perception of Voice Problems between Treatment-seeking Dysphonic Teachers and Non-teachers

Lo, Yuen Ting Cynthia

Abstract

This study investigated the perception of voice impairments between voice treatment seeking teachers and non-teachers. One hundred and ten dysphonic participants including 28 teachers and 62 non-teachers were recruited consecutively at three local voice clinics. The 110 participants included females and males, and teachers and non-teachers. The participants completed the Voice Activity and Participation Profile (VAPP, Ma & Yiu, 2001) to evaluate the perception of their voice problems. Acoustic and perceptual voice analyses were carried out to evaluate voice impairment severity. Results revealed that dysphonic teachers perceived similar degrees of voice severity, activity limitations and participation restrictions as dysphonic non-teachers. However, their voice impairment severity, as judged from perceptual evaluation, was significantly better than the dysphonic non-teachers. The results suggested that teachers with voice problems found voice impairments had greater impact on activity limitation and participation restriction than dysphonic non-teachers. As occupation may be one of the factors that affect the perception of voice impairment, when assessing or treating patients with voice problems, occupation of the patients should be taken into attention besides voice impairments. Voice activity limitations and voice participation restrictions of the patients should also be noticed so that the needs of the patients can be targeted and the patients are treated holistically.

Introduction

Teachers are considered as professional voice users. They are regarded as high-risk population for developing voice problems due to the extensive vocal demands required in teaching (Fritzell, 1996; Morton & Watson, 1998; Smith, Gray, Dove, Kirchner, & Heras, 1997; Smith, Kirchner, Taylor, Hoffman, & Lemke, 1998; Smith, Lemke, Taylor, Kirchner, & Hoffman, 1998; Titze, Lemke, & Montequin, 1997; Verdonlini & Ramig, 2001; Yiu, 2002). In general, the prevalence of voice problems in teachers can be quite high. Teachers were found to have higher prevalence of voice problems when compared with non-teachers (11.0% versus 6.2%) (Roy et al., 2004). The prevalence of voice disorders among teachers varied from 2.7% (Brindle & Morris, 1979) to 33% (Chan, Yiu, & Ma, 2005). The percentage of voice cases of teachers among all voice caseloads of speech pathologists in Hong Kong was 18% (Yiu & Ho, 1991).

Voice problems in teachers can lead to significant limitations in their voice activities and their ability to perform teaching tasks. Teachers have high demand on the use of their voice in terms of both duration and intensity (Morton & Watson, 1998). Also, they have to teach in an environment full of background noise which may further lead to voice problems. As the vocal demand of voice in teachers is high, the impacts of voice problems are high too. In the study by Chan, Yiu and Ma (2005),

it was found that about 33% of the secondary teachers (N = 52) surveyed had voice problems. At least 21% of the teachers had days off work due to voice problems. 38% of the teachers in the study had missing work days due to voice problems but the control subjects did not miss work due to voice problems (Smith, Lemke et al., 1998). Besides, job performance was also affected (Smith, Lemke et al., 1998; Yiu, 2002). Teachers have to use their voice to teach the students. If they have voice problems, they will not be able to instruct the students clearly and effectively. Therefore, voice problems can affect the job performances of the teachers and hence lead to activity limitations in teaching. Voice related functional impacts are not limited to job performance, but the overall subjective well-being in daily and social communication and emotional aspects. Nearly 75% of patients of the study of Smith et al. (1996) reported that voice problems adversely affects their social interaction and resulted in social isolation. Moreover, depression and negative professional self-esteem are not uncommon among dysphonic teachers. Similar findings was reported by Yiu (2002). Among the teachers surveyed, emotion, social life, perception of pressure on job and communication were found to be negatively affected by voice problems. In order to improve the quality of life of dysphonic teachers as they composed large proportion of the dysphonic populations, it is necessary to study the impacts of the voice disorders on their activity and participation.

The World Health Organization's International Classification of Functioning, Disability and Health (WHO, 2001) proposes that there are interaction effects between a disease with body functions and structures, activity limitation, and participation restriction. Activity limitation and participation restriction comply functioning at the individual and societal levels, respectively. For example, if a teacher is diagnosed to have vocal cord palsy, s/he may have breathy voice and hence will not be able to speak with normal voice (i.e. an impairment). As the teacher probably faces problems in using his/her voice to teach and has less well job performances, s/he is therefore affected at the level of activity limitation. Due to voice problem, s/he may have to take sick leave or have less communication with his/her families and friends in order to have vocal rest. This restriction in participating in voice activities can affect his/her quality of life. S/he may also have reduced social activity and emotional problems. Moreover, the ICF states that an "individual's functioning in certain aspect is a complex relationship between the health condition and contextual factors"(World Health Organization, 2001, p. 19). Contextual factors include environmental and personal factors. Personal factors include gender, age and occupation. Consider two patients, a teacher and a retired old man, who have similar severity of voice impairments. They may experience different levels of activity limitation and participation restriction because their occupational-related vocal

demand is different. The teacher needs to use his/her voice for teaching but the retired old man has relatively less vocal demand in his daily life. Therefore, similar level of impairment may result in different extents of activity limitation and participation restriction (Ma & Yiu, 2001).

From the above example, there is no definite relationship between voice impairment, activity limitation and participation restriction. Not only determined by the voice impairment, functional impacts of voice problem are also determined by how the individual perceive the voice problem (Yiu, 2002). The way that individuals perceive the voice problem may be related to the occupation of them as it is one of the personal factors which affects the relationship between impairment, activity limitation and participation restriction. However, there has been no study in the literature which compares the perception and impairment of voice problems among the dysphonic teachers and non-teachers in the time being. Therefore, it would be interesting to evaluate the relationship between voice impairment, activity limitation and participation restriction among dysphonic teachers and non-teachers. The teacher group was the target population because it composes a large population of the dysphonic patients. Besides, teachers are the ones who educate the new generation. Their job performance would affect the quality of learning in students.

The aim of the present study was to investigate and compare the voice

impairment severity and perceived functional impacts between dysphonic teachers and dysphonic non-teachers. It was hypothesized that, with similar levels of voice impairment severity, dysphonic teachers would perceive their voice worse than dysphonic non-teachers.

Clinical Implication

This study may help to find any differences between perceived voice severity and voice impairment of teachers. This helps to tailor made the treatment according to the profession of the patients by identifying the treatment targets. It is important to plan the treatments according to the impacts of the voice problems exerted on the individual's life. For example, if the functional impact (reflected from the activity limitation and participation restriction) is relatively more severe than the impairment, treatments should be targeted to facilitate the teachers' participation in activities. On the other hand, if the perceived functional impact is less severe than the impairment, treatments should focus at enhancing their vocal efficiency.

Method

Participants

One hundred and ten dysphonic patients were recruited for the present study.

They were consecutive patients recruited from two local hospitals in Hong Kong and the Voice Research Clinic of the Division of Speech and Hearing Sciences at the University of Hong Kong. All the participants had not received voice therapy prior to participating in this study. This cohort of participants included 62 dysphonic employed non-teachers (mean age = 37.69 years, SD = 8.03, range = 19 to 51 years), 28 dysphonic teachers (mean age = 32.71 years, SD = 9.48, range = 21 to 53 years) and 20 dysphonic housewives (mean age = 43.85 years, SD = 6.27, range = 34 to 54 years). All of them passed a hearing screening test at 25 dB HL in tones 250, 500, 1000, 2000, 4000 and 8000 Hz. All participants were native Cantonese speakers. For the employed non-teacher group, those participants with previous occupation as teacher were excluded from this study. Table 1 lists the demographic information of the three groups of subjects.

Table 1: Demographic information of participants.

	Teacher	Employed non-teacher	Housewife
Number of females	25	46	20
Number of males	3	16	0
Total	28	62	20
Mean age in years (SD)	32.71 (9.48)	37.69 (8.03)	43.85 (6.27)
Range in years	21-53	19-51	34-54
Laryngeal pathologies:			
vocal nodules	10	24	9
vocal polyp	0	2	2
chronic laryngitis	4	7	0
edema	1	3	1
thickened cords	13	20	4
vocal cord palsy	0	3	1
adduction gap	0	3	3

Procedure

Each subject completed a voice assessment battery for assessing their voice impairment severities and self-perceived functional impacts of voice problem.

Self-perceived functional impacts. The Voice Activity and Participation Profile (VAPP) (Ma & Yiu, 2001) (Appendix A) was used to measure the participant's self-perception of voice problems. VAPP is a self-assessing questionnaire which evaluates the impacts of voice disorders in job, daily communication, social

communication and emotion domains. There are five sections in the VAPP:

self-perceived severity of voice problem (1 item), effect on job (4 items), effect on daily communication (12 items), effect on social communication (4 items) and effect on emotion (7 items). Each item uses an 11-point equal-appearing interval scale (with 0 = normal, 10 = severe) to collect responses from the participants.

Voice impairment severity. Perceptual and acoustic analyses were used to evaluate the voice impairment severity. Each participants was required to read aloud a Cantonese sentence 爸爸打波 (meaning “Father hits the ball”) five times at their most comfortable pitch and loudness for recording. The sentences were recorded directly into the Kay Elemetrics’ Computerized Speech Lab Model 4300B Multi-dimensional Voice Program (Lincoln Park, NJ) with a professional-grade dynamic microphone (Shure, Beta, 87, Niles, IL) at a 10-cm mouth-to microphone distance.

For acoustic analysis, the voice samples recorded were segmented so that they began from onset of phonation of the first word (/ba/) and ended by the offset of the last word (/bɔ/). The segmented voice samples were then analyzed using the Kay Elemetrics’ Computerized Speech Lab Model 4300B Multi-Dimensional Voice Program to evaluate for acoustic jitter, shimmer, fundamental frequency and noise to harmonic ratio.

For perceptual analysis, three final year female speech pathology students (mean age = 22.0 years), who were studying at the Division of Speech and Hearing Sciences of the University of Hong Kong, were recruited as listeners for perceptual voice analysis. All of them passed a hearing screening test at 25 dB HL in tones 250, 500, 1000, 2000, 4000 and 8000 Hz.

Perceptual training sessions were carried out prior to the perceptual voice evaluation. The training and evaluation were both carried out in the sound-treated booth. Two phases were carried out. Phase one involved training and evaluation of female voice stimuli only. Phase two involved training and evaluation of male voice stimuli only. The Perceptual Severity Training Program (Chan & Yiu, 2002) was used for both of the training and the perceptual evaluation. In each phase, two training sessions were provided for the listeners to achieve an inter-rater reliability of 0.8 before they could proceed to the evaluation of the experimental voice samples. During training, a stimulus-response-feedback-stimulus paradigm was used to train the listeners. During the evaluation of the actual stimuli, only stimulus-response paradigm was used. The Program provided the listeners with seven synthesized voice anchors to evaluate the voice samples on breathiness, roughness and overall severity with an 11-point equal-appearing interval scale. The anchors included breathy, rough (two kinds of rough voices) and normal voices. For each of the breathy and rough voice,

two anchors of just noticeable and more obvious severity levels were provided.

During evaluation, each segmented stimulus was repeated once in each gender group in randomized order. Cautions were taken such that no two consecutive identical stimuli were presented. The segmented stimuli were presented with a pair of headphones (Sennheiser, HD-25). The time needed for each training session of female and male voice samples were about 15 and 10 minutes respectively. The duration of the evaluation of female and male voice samples were about 90 and 10 minutes respectively.

Inter-rater and Intra-rater reliability of perceptual evaluation

Pearson's r was used to evaluate both inter and intra-rater reliabilities. Intra-rater was evaluated among the duplicated voice samples of each listener. Inter-rater reliability was evaluated by comparing the perceptual ratings of severity of the voice samples among the three listeners.

Results

Activity limitation and participation restriction

The means and standard deviations of the VAPP scores are listed in Table 2.

One-way ANOVA was used to evaluate if there was any group difference in the VAPP

scores. The results revealed that there were significant group differences in five VAPP scores. They were the Total Activity Limitation Score (ALS) ($F_{(2, 107)} = 5.38, p = 0.006$), Job Section Score ($F_{(2, 107)} = 5.81, p = 0.004$), Job ALS ($F_{(2, 107)} = 11.50, p = 0.001$), Daily Communication Section Score ($F_{(2, 107)} = 3.19, p = 0.045$) and Daily Communication ALS ($F_{(2, 107)} = 5.36, p = 0.006$).

Post hoc comparisons using Scheffe Test of the VAPP scores revealed that dysphonic employed non-teachers had significantly higher Total ALS than dysphonic housewives ($p=0.006$). Dysphonic teachers had significantly higher Job Section Score than dysphonic housewives ($p = 0.004$). Both dysphonic teachers and dysphonic employed non-teachers had higher Job ALS than housewives (both $p = 0.001$). However, there was no significant difference in the extent of activity limitation between dysphonic teachers and dysphonic employed non-teachers. Moreover, dysphonic employed non-teachers had higher Daily Communication Section Score and Daily Communication ALS than dysphonic housewives ($p = 0.045$ and 0.007 respectively).

Table 2: Means (and standard deviations) and ANOVA results of the Voice Activity and Participation Profile (VAPP) Scores

Section and Score	Teacher (N=28)	Employed non-teacher (N=62)	Housewife (N=20)	Mean difference between 3 groups	
	Mean (SD)	Mean (SD)	Mean (SD)	$F_{(2,107)}$	p -level
Self perceived severity	6.24 (1.37)	6.00 (1.94)	5.01 (2.07)	2.89	0.06
Job					
Section score	21.92 (8.86)	18.25 (9.40)	12.59 (9.94)	5.81	0.004*
ALS	14.39 (4.00)	12.40 (5.21)	7.52 (5.48)	11.50	0.001*
PRS	7.54 (5.79)	5.85 (5.90)	5.07 (5.01)	1.27	0.29
Daily communication					
Section score	59.68 (24.69)	64.66 (26.13)	47.14 (32.41)	3.19	0.045*
ALS	29.45 (13.47)	34.00 (13.98)	22.10 (16.47)	5.36	0.006*
PRS	30.23 (13.29)	30.66 (14.87)	25.05 (16.31)	1.14	0.33
Social communication					
Section score	13.99 (9.05)	15.41 (11.12)	12.57 (11.94)	0.57	0.57
ALS	6.37 (4.82)	7.96 (5.59)	6.49 (6.01)	1.07	0.35
PRS	7.62 (5.05)	7.46 (6.32)	6.08 (6.35)	0.47	0.63
Emotion					
Section score	37.17 (15.65)	37.55 (17.58)	30.30 (20.46)	1.34	0.27
Total ALS	50.21 (19.34)	54.36 (21.27)	36.10 (25.67)	5.38	0.006*
Total PRS	45.39 (20.09)	43.96 (22.94)	36.20 (25.65)	1.10	0.34
Total VAPP score	139.01 (50.18)	141.88 (54.75)	107.60 (68.44)	2.90	0.06

Note: * $p < 0.05$ (2-tailed)

ALS = Activity Limitation Score; PRS = Participation Restriction Score

Voice impairment severity

The voice impairment severities of the three groups of participants, as evaluated by perceptual and acoustic measures, are listed in Table 3. One-way ANOVA was used to evaluate if there was any group difference among the ratings of voice impairments.

Acoustic Evaluation. The results indicated that there was no statistically significant difference among the three groups for all of the acoustic parameters.

Perceptual Evaluation. The results indicated that there were significant group differences in perceptual roughness ($p = 0.001$) and overall severity ($p = 0.005$). However, there was no statistically significant difference in perceptual breathiness.

Post hoc comparisons using Scheffe Test of the ratings of voice impairments indicated that employed non-teachers ($p = 0.002$) and housewives ($p = 0.005$) had voice with significantly more severe roughness than teachers. However, there was no significant group difference between employed non-teachers and housewives on the voice quality of roughness. Similarly, both employed non-teachers ($p = 0.009$) and housewives ($p = 0.029$) had significantly more severe overall voice impairments than teachers. However, there was also no significant group difference between employed non-teachers and housewives in the rating of overall severity.

Table 3: Means (and standard deviations) and ANOVA results of voice impairment

Voice Impairment Severity	Teacher	Employed	Housewife	Mean Difference	
	(N=28)	non-teacher (N=62)	(N=20)	between 3 groups	
	Mean (SD)	Mean (SD)	Mean (SD)	$F_{(2,107)}$	p -level
Acoustic Analysis					
F ₀	206.45 (30.14)	188.88 (43.91)	207.11 (21.71)	3.05	0.051
Jitter	1.46 (0.60)	1.92 (1.05)	1.92 (1.21)	2.30	0.11
Shimmer	8.39 (1.87)	10.08 (3.66)	10.51 (5.12)	2.66	0.07
N/H ratio	0.23 (0.05)	0.24 (0.07)	0.27 (0.10)	2.45	0.09
Perceptual Analysis					
Roughness	2.39 (1.21)	4.02 (2.22)	4.36 (2.24)	7.78	0.001*
Breathiness	2.42 (1.99)	3.38 (2.45)	2.65 (2.02)	2.02	0.14
Overall Severity	3.09 (1.72)	4.69 (2.39)	4.87 (2.41)	5.63	0.005*

Note: * $p < 0.05$ (2-tailed)

F₀ = Fundamental frequency; N/H ratio = Noise to harmonic ratio

Inter-rater and intra-rater reliability

Inter-rater and intra-rater reliability were evaluated using Pearson's r . For female voice stimuli, the inter-rater reliability ranged from 0.48 to 0.73 and for the male voice stimuli, the inter-rater reliability ranged from 0.74 to 0.90 (see Table 4). Listener 1 has the highest coefficient of intra-rater reliability where as Listener 2 has the lowest coefficient (see Table 5).

Table 4: Inter-rater reliability (Pearson's r) of the evaluation sessions.

	Female Voice Stimuli			Male Voice Stimuli		
	<i>Roughness</i>	<i>Breathiness</i>	<i>Overall Severity</i>	<i>Roughness</i>	<i>Breathiness</i>	<i>Overall Severity</i>
Listener 1 Vs 2	0.48	0.66	0.70	0.74	0.90	0.83
Listener 1 Vs 3	0.67	0.60	0.71	0.83	0.84	0.86
Listener 2 Vs 3	0.47	0.63	0.73	0.75	0.75	0.81

Note: All correlation coefficients were significant at the 0.01 level (2-tailed)

Table 5: Intra-rater reliability (Pearson's r) of the evaluation sessions of different listeners.

	Female Voice Stimuli			Male Voice Stimuli		
	<i>Roughness</i>	<i>Breathiness</i>	<i>Overall Severity</i>	<i>Roughness</i>	<i>Breathiness</i>	<i>Overall Severity</i>
Listener 1	0.74	0.68	0.81	0.90	0.89	0.95
Listener 2	0.85	0.74	0.78	0.89	0.66	0.91
Listener 3	0.78	0.66	0.86	0.87	0.82	0.90

Note: All correlation coefficients were significant at the 0.01 level (2-tailed)

Discussion

The aim of the present study was to investigate and compare the voice impairment severity and perceived functional impacts between dysphonic teachers and dysphonic non-teachers. It was hypothesized that dysphonic teachers would perceive their voice worse than dysphonic non-teachers with similar levels of voice impairment severity.

Self-perceived severity of voice problems

The present results revealed that there was no significant group difference in the self-perceived severity between the three groups of participants (see Table 2). This revealed that the treatment seeking dysphonic teachers perceived their voice problem as severe as the dysphonic employed non-teachers and dysphonic housewives. Their voice problems exhibited similar degrees of activity limitation and participation restriction on them. As the participants were consecutive patients of the two local hospitals and a voice research clinic, similar impact of voice problem on activity and participation may be explained by the reason that when the patients perceived of having certain degree of voice severity, they would go to seek voice therapy.

Activity limitation and participation restriction

For the other VAPP scores, there were significant differences between dysphonic teachers and dysphonic housewives, and dysphonic employed non-teachers and dysphonic housewives on Total Activity Limitation Score (ALS), Job Section Score, Job ALS, Daily Communication Section Score and Daily Communication ALS. The dysphonic employed individuals (teachers and non-teachers) reported greater activity limitations in job and daily communication than the dysphonic unemployed group (housewives). This might be due to the reason that dysphonic employed individuals have to speak to people with their impaired voice during working. This may affect their professional images and job performances and therefore affecting their activities in job and daily communication. However, the people that housewives usually speak to are their family members and friends. Family members and friends may be more tolerable to the voice problems of the dysphonic housewives. So, dysphonic housewives had less activity limitation in daily communication and job.

The result also revealed that although the three dysphonic groups had significant difference in activity limitation, they did not have significant group difference in participation restriction. Therefore, it can be interpreted as the voice impairments imposed different constraints in the employed group and unemployed group but both groups have similar reduction or avoidance in participation of voice activities (Ma & Yiu, 2001).

Voice Impairment Severity

There was no significant group difference between teachers and employed non-teachers in the acoustic analysis but there were significant group differences between these two groups on perceptual rating of roughness and overall severity. This showed that the result of acoustic evaluation was not concurrent with the result of the perceptual evaluation. The literature had documented the weak correlations between perceptual and acoustical measures (Yiu et al., 2000). Acoustic voice analysis might not be sensitive enough to differentiate voices among the three groups of participants (Yiu et al., 2000). Therefore, result of the perceptual evaluation will be adapted for the discussion below.

From the present results, it was found that among the participants, the treatment seeking teachers had significantly less severe voice impairments than employed non-teachers. As the participants were consecutive patients recruited from three local voice clinics, this result suggested that teacher and non-teachers went to seek voice therapy with different levels of voice impairment. Together with the result of similarities between the two groups in the self-perceived voice severity, it can be shown that patients may go to seek voice therapy according to their self perception of voice problems and may not according to their voice impairments.

In summary, the results revealed that although dysphonic teachers and dysphonic

non-teachers reported similar extents of self-perceived severity and activity limitation, as reflected from similar VAPP scores, the dysphonic teachers had less severe voice impairment than the dysphonic non-teachers. Therefore, the present results support the hypothesis that with similar levels of voice impairment severity, dysphonic teachers would perceive greater functional impacts. This may be due to the fact that teachers had higher demand on the use of voice than employed non-teachers (Morton & Watson, 1998). Therefore, voice problems may lead to significant limitation in activity for teachers than employed non-teachers.

On the other hand, the participants were consecutive patients recruited from three local voice clinics. From the result of the perceptual voice analysis, it was found that the teacher group had less severe voice than the employed non-teacher group and housewife group. This result reveals that, when compared with the dysphonic teachers, the dysphonic non-teachers and housewives seek voice therapy when their voice problems were more severe. Dysphonic teachers might have sought voice therapies earlier than employed non-teachers. Therefore, they were more sensitive to the voice problems than the non-teachers and seek help at an earlier stage.

International Classification of Functioning, Disability and Health

Referring to the International Classification of Functioning, Disability and

Health model about interaction effects between a disease with body functions and structure, activity limitation and participation restriction (World Health Organization, 2001), same degree of activity limitation does not necessary result from same degree of voice impairments. In this study, dysphonic teachers and dysphonic non-teachers reported similar extents of activity limitation as reflected by the VAPP scores. However, their voice impairments were significantly different from each other. That is, different impairment levels may lead to similar extents of activity limitation. Moreover, this study showed that the contextual factor of particular interest in this study, occupation, may be one of the factors that affect the interaction effect between voice impairment and activity limitation. When a health condition, which is demanded to the occupation of a person, is impaired, it may have significant impacts on activity limitation. Therefore, the results of the present study support the application of the International Classification of Functioning, Disability and Health model in clinical management of voice disorders.

Clinical Implications

This study revealed that same level of activity limitation may be resulted from different voice impairment severities. Therefore, in voice assessments and treatments, we should target all the three levels of voice impairment, activity limitation and

participation restriction. Treatments should be provided to the patient with a holistic approach so that we are targeting the needs of the patients. When the needs of the patient are considered for the goal setting of voice treatment program, quality of life of the patients will be probably improved. During goal setting, the therapist should judge the voice impairments by both perceptual and acoustic measures. In addition, the dysphonic patients should fill in the VAPP. Moreover, more descriptive answers should be obtained by asking the patients about the difficulties that they face in daily life, the ways they are affected by their voice problems and the aspects that they want to have improvements.

Secondly, this study revealed that dysphonic teachers and dysphonic employed non-teachers had perceived more activity limitation than dysphonic housewives. Also, dysphonic teachers have less severe voice impairment than dysphonic non-teachers although they had similar self-perception of voice problem. Therefore, occupation is one of the factors that affects ones' perception of voice severity. Consequently, we should address the patient's occupation before voice treatment is started. If a dysphonic patient who has an occupation which has high demand on voice, like teacher, it is needed to tailor made the voice treatment according to his/her voice impairment and especially on activity limitation because they may encounter more activity limitation than other dysphonic patients from other occupations. For example, if the teacher has

problem with teaching with his/her own voice, treatment should include helping the patient to identify possible solutions to the problems that s/he faces. In order to convey his/her message during the lessons effectively, the teacher can use microphone and prepare some written notes.

Conclusion and future direction

In conclusion, this study revealed that teachers and employed non-teachers had different perception on their voice severity. Although they reported similar level of perceived voice severity and activity limitation and participation restriction, they had different severities of voice impairments. Occupation may be one of the factors that affects the perception of voice severity. Secondly, the result revealed that teachers were more sensitive to their voice problems because they seek for voice therapy even though their voice impairments were less severe when compared to employed non-teachers.

However, there are several limitations in this study. First, there were 110 participants in this study in which 62 of them were dysphonic employed non-teachers and 28 of them were dysphonic teachers. To have a more representative sample size, recruitment of more participants, especially teachers is recommended. Second, in this study, the participants' need of voice for job and communication purpose was not investigated. In order to understand more about the factors that affect perception of

voice impairment, it is recommended to study the relationship between the need of voice and perception of voice severity.

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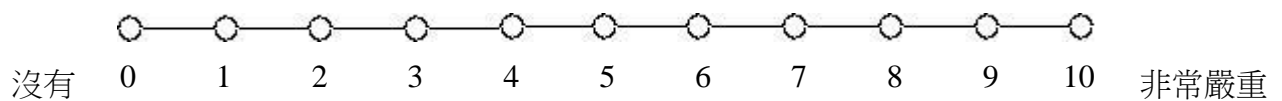
Australian Journal of Human Communication Disorders, 19, 45-58

Appendix A:

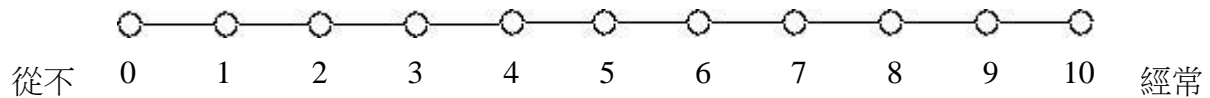
Voice Activity and Participation Profile (Chinese Version)

Voice Activity and Participation Profile
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 Department of Speech and Hearing Sciences
The University of Hong Kong

1. 你覺得你現時聲線問題的嚴重程度有多少？



請回答以下問題，並在你認為適當的數字上圓圈劃上“X”，以表示受影響的程度。
 線的左方，代表沒有受影響；線的右方，代表常常受到影響。



聲線對工作的影響

2. 你的聲線問題對你現時的工作有多少影響？
3. 在過往半年內，你有沒有因為聲線問題而考慮或嘗試轉工？
4. 你有沒有因聲線問題而使工作壓力增加？
5. 在過往半年內，你的聲線問題有沒有影響你對未來職業的選擇？

聲線對溝通的影響

6. 別人有沒有因你聲線不清而要求你把說話重覆？
7. 在過往半年內，你有沒有因聲線問題而減少和別人說話？
8. 在講電話時，對方有沒有因你的聲線問題，而不明白你的意思？
9. 在過往半年內，你有沒有因聲線問題而減少講電話？
10. 在特別寧靜的環境下，你有沒有因聲線問題而影響你與別人溝通？
11. 在過往半年內，你有沒有因聲線問題而避免在特別寧靜的環境下說話？
12. 在噪雜的環境下，你有沒有因聲線問題而影響你與別人溝通？
13. 在過往半年內，你有沒有因聲線問題而避免在噪雜的環境下說話？
14. 你有沒有因聲線問題而影響你面對一大群人說話？

15. 在過往半年內，你有沒有因聲線問題而避免對一大群人說話？
16. 你有沒有因聲線問題而影響你表達意思？
17. 在過往半年內，你有沒有因聲線問題而避免說話？

聲線對社交的影響

18. 你有沒有因聲線問題而影響你參加社交活動？
19. 在過往半年內，你有沒有因聲線問題而減少或避免參與社交活動？
20. 你有沒有因聲線問題而令你的家人，朋友或同事感到煩擾？
21. 在過往半年內，你有沒有因你的聲線問題而減少與家人，朋友或同事溝通？

聲線對個人的影響

22. 你有沒有因聲線問題而感到不快？
23. 你有沒有因聲線問題而感到尷尬？
24. 你有沒有因聲線問題而感到自卑？
25. 你有沒有因聲線問題而感到憂慮？
26. 你有沒有因聲線問題而感到不滿？
27. 你有沒有因聲線問題而影響你的性格？
28. 你有沒有因聲線問題而影響你的專業形象？

Voice Activity and Participation Profile (English Version)

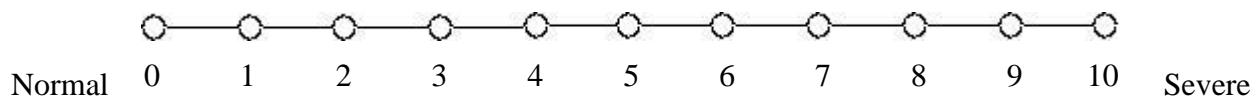
Voice Activity and Participation Profile

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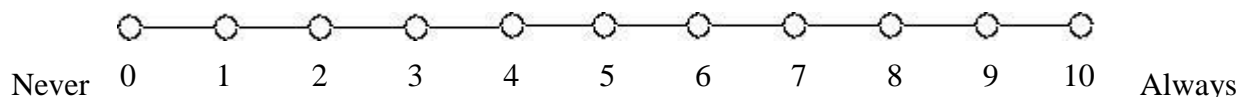
Department of Speech and Hearing Sciences

The University of Hong Kong**Self-perceived severity of voice problem**

1. How severe is your voice problem now?



For each of the question below, please indicate the answer by writing the number beside the question by considering the following scale:

**Effect on job**

2. Is your job affected by your voice problem?
3. In the last 6 months, have you thought of changing you job because of your voice problem?
4. Has your voice problem created any pressure on your job?
5. In the last 6 months, has your voice problem affected your decision for your future career?

Effect on daily communication

6. Do people ask you to repeat what you have just said because of your voice problem?
7. In the last 6 months, have you ever avoided talking to people ecause of your voice problem?
8. Do people have difficulty understanding you on the phone because of your voice problem?
9. In the last 6 months, have you reduced the use of the telephone because of your voice problem?
10. Does your voice problem affect your communication in quiet environment?
11. In the last 6 months, have you ever avoided having conversations in quite

- environments because of your voice problem?
12. Does your voice problem affect your communication in noisy environments?
 13. In the last 6 months, have you ever avoided having conversations in noisy environment because of your voice problem?
 14. Does your voice problem affect your message when speaking to a group of people?
 15. In the last 6 months, have you ever avoided having conversations in a group because of your voice problem?
 16. Does your voice problem affect getting your message across?
 17. In the last 6 months, have you ever avoided speaking because of your voice problem?

Effect on social communication

18. Does your voice problem affect you in social activity?
19. In the last 6 months, have you ever avoided social activities because of your voice problem?
20. Are your family, friends, or co-workers annoyed by your voice problem?
21. In the last 6 months, have you ever avoided communicating with your family friends, or co-workers because of your voice problem?

Effect on emotional communication

22. Do you feel upset about your voice problem?
23. Are you embarrassed by you voice problem?
24. Do you have self-esteem because of you voice problem?
25. Are you worried about your voice problem?
26. Do you feel dissatisfied because of your voice problem?
27. Does your voice problem affect your personality?
28. Does your voice problem affect your self image?