

# Analysis of English Post-alveolar fricatives produced by Chinese Learners

# Learners' production of /ʒ/

South

casual

decision

pleasure

usually

“/ʒ/-like”

North

measure

casual

television

usually

“/r/-like”

# Post-alveolar Fricative in IPA

Coronal		Dorsal
<u>Palato-alveolar</u>	Retroflex	<u>Alveolo-palatal</u>
(tip, blade)	(tip, blade)	(blade)
ʃ · · · ʒ	ʂ · · · ʐ	ç · · · ʝ

/ʃ,ʒ/ the front of the tongue body is domed, weakly polarized. (English)

/ʂ,ʐ/ a flat, concave or even curled shaped tongue, polarized. (Chinese Mandarin)

/ç,ʝ/ blade of tongue behind Alveolar bridge and body of the tongue raised towards palatal, polarized. (Mandarin and Wu dialect)

# approximant v.s. fricative of “z” in mandarin

1. In syllable-initial position:

[ɻ] a retroflex approximant: 如 [ɻaŋ]

[ʐ] a voiced retroflex sibilant: 肉 [ʐoʊ]

2. In most cases, it's an approximant in mandarin:

- no obvious trace of frication
- short duration
- low intensity
- with formants
- Statistical analysis on many Chinese dialects indicate its approximant properties
- (石峰, 1987) (朱晓农, 2007)

*Conclusion: No real voiced fricatives in mandarin*

# Post-alveolar voiced fricative ‘z’ in Chinese Wu dialect

## 1. The complementary allophone of ‘ɕ’.

(In vernacular language, in word-initial position, phonetic voicing is neutralized and replaced with the voiceless allophone ‘ɕ’.)

e.g. 谢谢 [ɕia zia] 🗣️

树 [ɕy] 🗣️ v.s. 大树 [da zy] 🗣️

寻 [ɕin] 🗣️ v.s. 我来寻你 [zin] 🗣️

## 2. Influence of mandarin.

*Conclusion: the voiced fricative ‘z’ still exists in Wu dialect, but might be with unstable status.*

# Questions

1. How do learners from southern and northern part of China produce English 'z' sound?
2. Why the difference? How does mother language influence our phonological production of a foreign language?
3. Which influences the third language phonological production more, 1<sup>st</sup> or 2<sup>nd</sup> language?

# Experiment

## 1. Subjects:

Chinese speakers : from north China (10, Hebei, Shangdong, Inner Mongolia, Gansu)  
from Wu dialect zone (10, Shaoxing, Hangzhou, Ningbo, Wenzhou)  
native speakers: From UK (3)  
From US (3)

## 2. Methodology:

- A: Ss read sample words, phrases, and sentences with target sounds. Data was then gathered for comparison.
- B: two variances “ Center of Gravity” and “Dispersion” were used to measure pattern of the fricatives.
- C: Target sounds combine for.....

## 3. Recording:

Each subject was given 5 minutes to practice reading the speech materials before the recording.  
sampling rate 22050, 50ms segment of each target sound .

# Results

1. Voiceless fricatives
2. Voiced fricatives

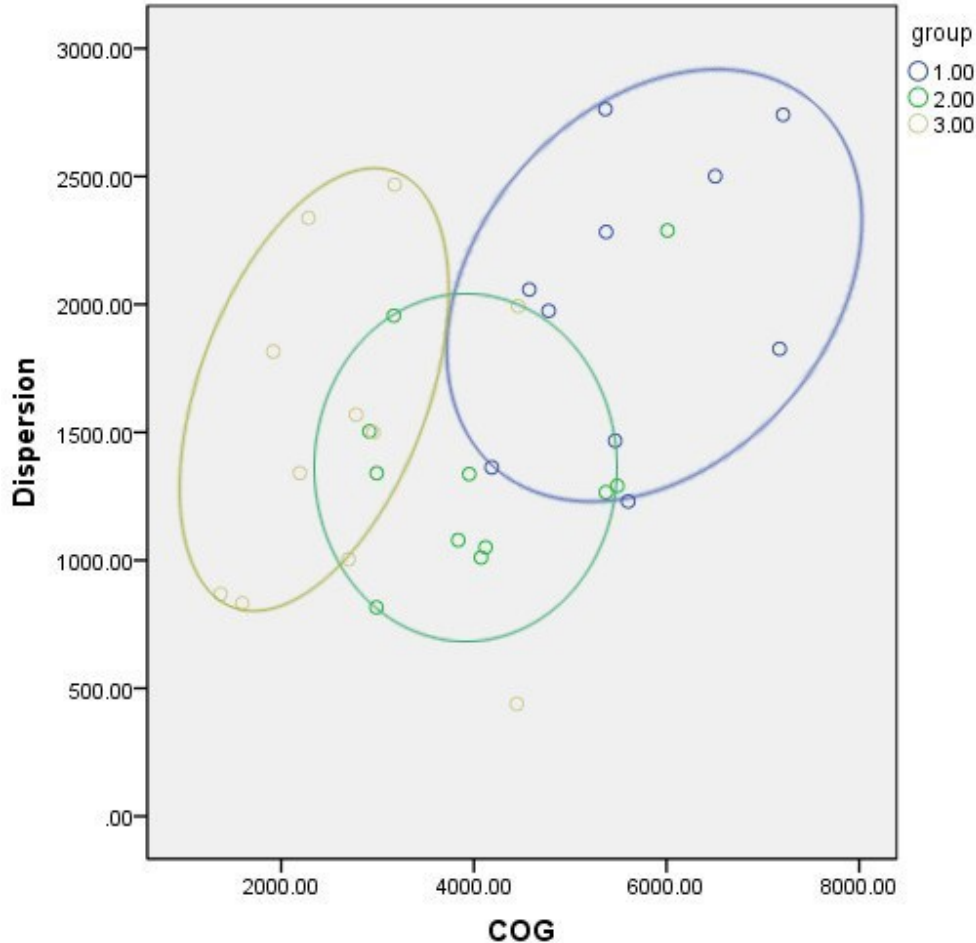


# 1. Positions of Chinese dialectal voiceless fricatives

Group 1: [ç]  
in southern  
dialect

Group 2: [ç]  
in northern  
dialect

Group 3: [ʃ]  
in northern  
dialect



1. southern [ç] v.s. northern [ç]  
Tongue position more fronted  
More frication

2. northern [ʃ] is more back-  
ward and fricative than  
northern [ç]

3. Tongue position:  
[ʃ], northern [ç], southern [ç]

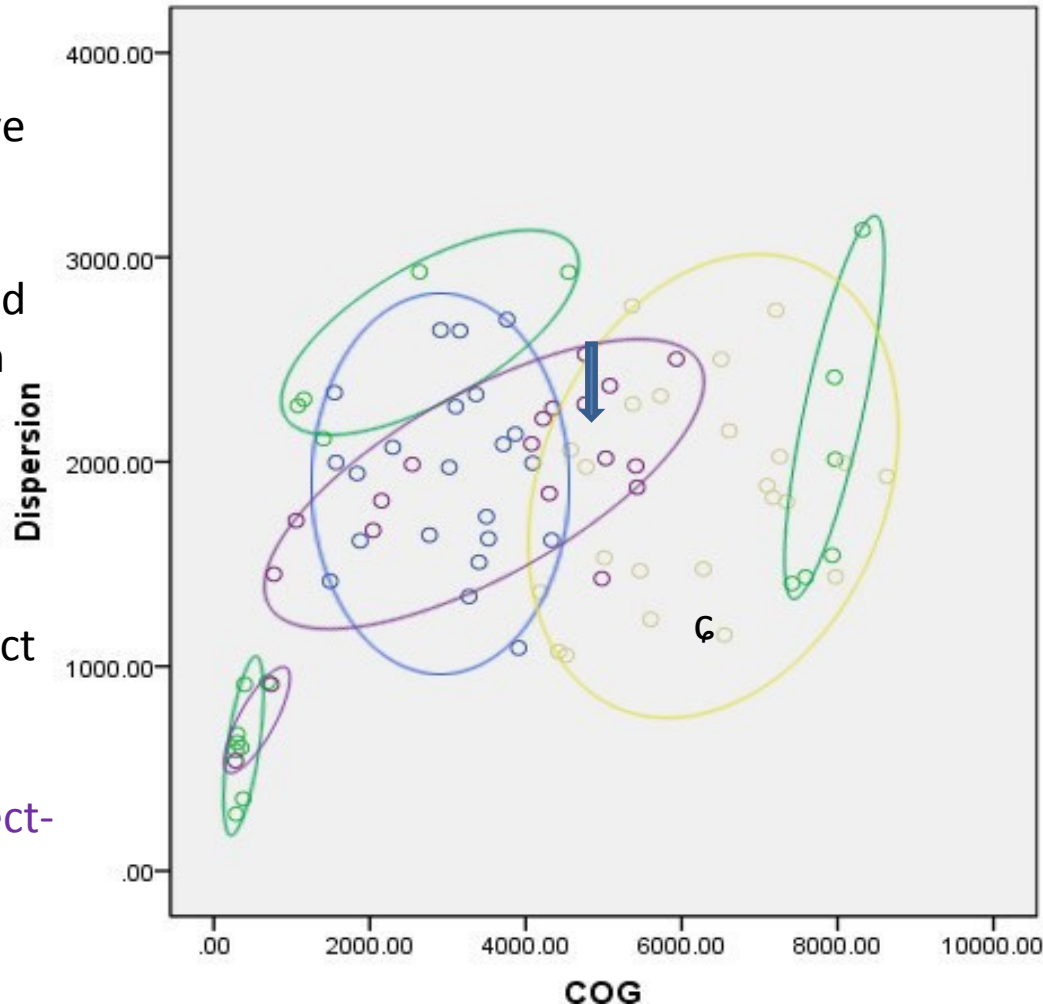
# southern dialect-accented [ʒ]

Group 1:  
Group 1: Native  
English [ʒ]

Group 2: voiced  
[ʒ] in southern  
dialect

Group 3:  
voiceless [ç] in  
southern dialect

Group 4:  
Southern dialect-  
accented [ʒ]



1.southern dialect  
voiceless [ç] was  
presented to examine  
its influence on target  
English voiced  
fricative [ʒ]  
2.tongue position of  
southern dialect-  
accented [ʒ] was  
influenced by both  
local dialectal voiced  
and voiceless  
fricatives  
3. The arrow indicates  
a good number of [ʒ]  
are actually  
pronounced as [ç], as  
presented earlier

# northern dialect-accented [ʒ]

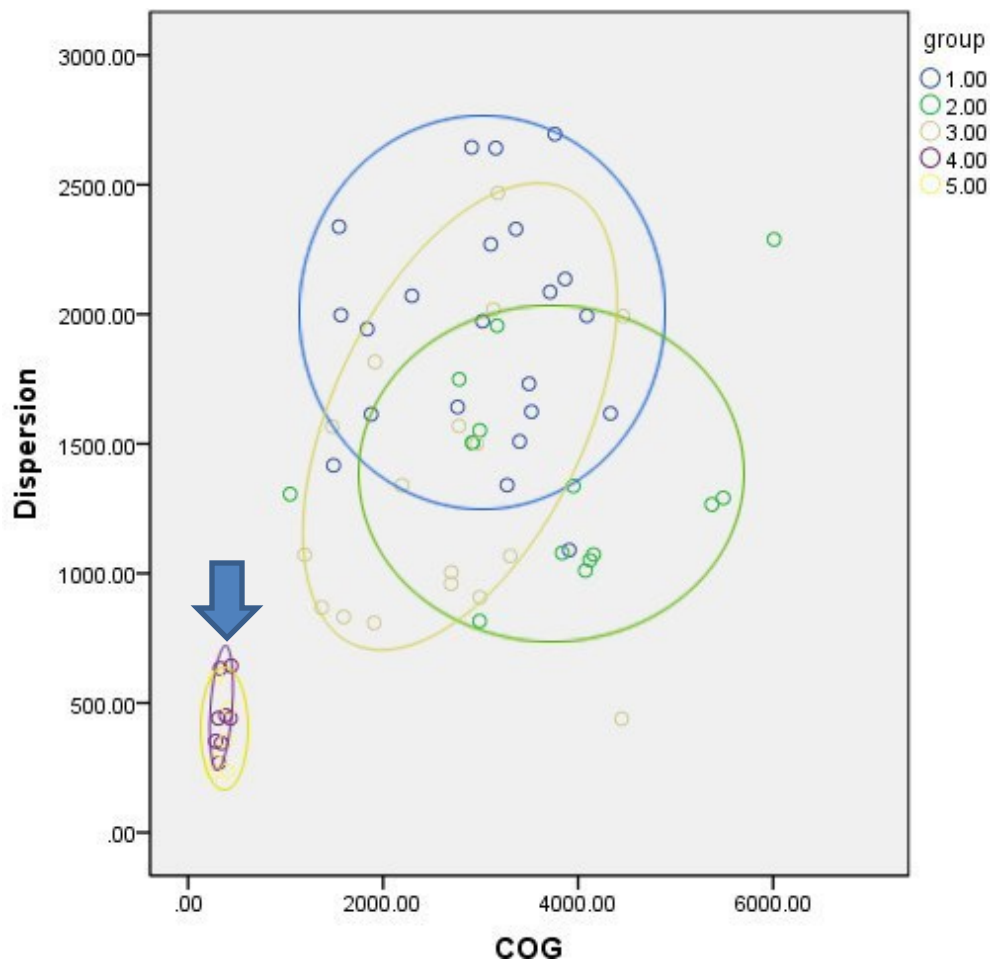
Group 1: Native English [ʒ]

Group 2: voiceless [ç] in northern dialect

Group 3: voiceless [ç̥] in northern dialect

Group 4: voiced [ʒ] in southern dialect

Group 5: northern dialect-accented [ʒ]



1. Position of northern dialect-accented [ʒ] is solely influenced by local voiced fricative (approximate), which explains why Ss from north China produce /r/-like [ʒ].

# Conclusion

- 1. Ss from southern dialectal zone mainly choose to replace target English [ʒ] with the voiceless counterpart (English [ʃ] or dialectal [ç]), a sound that is still within the category of fricatives
- 2. Ss from northern dialectal zone unanimously replace target English voiced fricative [ʒ] with an approximant [ʒ] ([ɹ] actually), a sound which belongs to an totally different category.

# Speech Perception: Categorical perception

## Categorical perception:

People perceive speech sounds categorically, they are more likely to notice the differences between categories(phonemes) than within categories. The perceptual space between categories is therefore warped, the centers of categories or “prototypes” working like a sieve or like magnets for incoming speech sounds

# Assumptions

1. perception and production of a foreign sounds may have dimensions. In this case, the hierarchy could be:

Voiced/voiceless factor



The factor of frication

*Ss in northern dialect zone can obviously notice the categorical difference between fricatives and approximants more easily than within the fricatives, but they use an approximant [ɹ], instead of a voiceless fricative [ɸ] or [ɬ], to substitute a fricative sound [ʒ].*

2. When a local sound, which could have functioned as the counterpart of a foreign sound, is not stable in its phonological status, it might not be used as the substitution of the foreign sound. (*[ʒ] in southern dialect*)
3. The successful differentiation of the categories doesn't necessarily help 2<sup>nd</sup> or 3<sup>rd</sup> language learners establish the proper production space and of a foreign sound. (although a proper perceptual space might be established, in which case, it proves that a proper perceptual space doesn't always mean a proper production space) (*[ɹ] and [ʒ]*)
4. When cross categorical substitution take places, the new production space is definitely different from both of the original ones, in other words, there is hardly a space assimilating both original ones.

A: in northern dialect, when [ɹ] is used to replace [ʒ], it shows no traces of [ʒ] characters in terms of COG and Dispersion( whereas [ʒ] produced by southern Ss shows signs of English [ʒ], southern [ʒ] and southern

B: mandarin [ɹ] produced by southern Ss show no signs of original fricatives characters.(Next page)

# Questions

1. In terms of first language sound transferring into second language sound:

A: Southern dialect Ss establish new sound category [ɹ]-----successful

B: Northern dialect Ss establish new sound category [ʒ]-----unsuccessful (they still stick to [ɹ])

2. In terms of first language sound transferring into the third language sound:

southern dialect Ss couldn't establish proper new

C: [ʒ] category-----half successful

A, C are compatible with Flege's theory. What about B?

Thank you