# English as a lingua franca: mutual intelligibility of Chinese, Dutch and American speakers of English

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# Appendices

**Appendix A4.1 Semantically Unpredictable Sentences (SUS)**

Structure 1: Subject – Intransitive Verb – Adverbial Phrase:

1. The state sang by the long week.
2. The man lay through the wide war.
3. The day hung to the great night.
4. The year smiled through the young head.
5. The time ran with the high side.
6. The way ran of the hot room.
7. The thing hung from the small line.
8. The grass lied on the blue night.
9. The school stayed for the new tube.
10. The hand fell of the high form.

Structure 2: Subject – Transitive Verb – Direct Object

1. The real field made the vote.
2. The white home got the art.
3. The clear friend brought the ground.
4. The white sense held the air.
5. The whole month brought the air.
6. The thin job got the road.
7. The poor sense hit the tax.
8. The short field said the air.
9. The full home took the term.
10. The white sense ate the road.

Structure 3: Imperative Verb – Direct Object

1. Use the game or the hair.
2. Ask the trial and the tree.
3. Leave the sport and the thought.
4. Call the club and the growth.
5. Turn the love or the test.
6. Add the sale or the nose.
7. Start the store or the price.
8. Show the plant or the sound.
9. Feel the stock and the list.
10. Live the sport and the fund.

Structure 4: Question word – Verb – Subject – Direct Object

1. When does the charge like the late plane?
2. Where does the band sell the low set?
3. Why does the cell like the deep length?
4. When does the gun like the deep bed?
5. Why does the range watch the fine rest?
6. When does the sign lead the red roof?
7. How does the chance plan the cold fear?
8. How does the chance send the deep roof?
9. Why does the gun bear the red trade?
10. How does the cloud watch the low text?

Structure 5: Subject – Verb – Complex Direct Object

1. The farm meant the hill that burned.
2. The curve helped the blood that won.
3. The hope rode the boat that failed.
4. The crowd heard the moon that lost.
5. The inch paid the branch that passed.
6. The song paid the ball that stopped.
7. The truth rode the hill that died.
8. The lost paid the moon that worked.
9. The aid rode the glass that rose.
10. The truth rode the leg that failed.

**Appendix A4.2. Sentences of the Speech-in-Noise test (SPIN)**

| Low predictability | High predictability |
|---|---|
| 1. Ruth could have discussed the wits. | 26. Throw out all the useless junk. |
| 2. We could discuss the dust. | 27. She cooked him a hearty meal. |
| 3. We spoke about the knob. | 28. Her entry should win the first prize. |
| 4. Paul hopes we heard about the loot. | 29. The stale bread was covered with mold. |
| 5. David might consider the fun. | 30. The firemen heard her frightened scream. |
| 6. Paul could not consider the rim. | 31. Your knees and your elbows are joints. |
| 7. He heard they called about the lanes. | 32. I ate a piece of chocolate fudge. |
| 8. They had a problem with the cliff. | 33. Instead of a fence, plant a hedge. |
| 9. Harry will consider the trail. | 34. The story had a clever plot. |
| 10. We are considering the cheers. | 35. The landlord raised the rent. |
| 11. She has known about the drug. | 36. Her hair was tied with a blue bow. |
| 12. Bill had a problem with the chat. | 37. He's employed by a large firm. |
| 13. We hear they asked about the shed. | 38. To open the jar, twist the lid. |
| 14. Jane had not considered the film. | 39. The swimmer's leg got a bad cramp. |
| 15. Jane did not speak about the slice. | 40. Our seats were in the second row. |
| 16. Paul was interested in the sap. | 41. The thread was wound on the spool. |
| 17. I am discussing the task. | 42. They tracked the lion to his den. |
| 18. Ruth has discussed the peg. | 43. Spread some butter on your bread. |
| 19. Tom is considering the clock. | 44. A spoiled child is a brat. |
| 20. He's thinking about the roar. | 45. Keep your broken arm in a sling. |
| 21. I should have known about the gum. | 46. The mouse was caught in the trap. |
| 22. They heard I asked about the bet. | 47. I have got a cold and a sore throat. |
| 23. Betty doesn't discuss the curb. | 48. Ruth poured herself a cup of tea. |
| 24. He had a problem with the tin. | 49. The house was robbed by a thief. |
| 25. He wants to know about the rib. | 50. Wash the floor with a mop. |

**Appendix A4.3. Questionnaire.**

**INFORMATION FORM**

***(Note: personal information contained here will not be released)***

Name: _____

Subject Number: _____ Today's date _____

Email: _____ Telephone number _____

Age: ____ Gender: Male / Female

1. Where were you born? (city, state (province), country) _____

2. How long have you lived there? _____

3. Did you move from that place? Y / N
   How old were you then? _____

4. Where did you attend elementary school? _____
   What language did you use at school? _____

5. Where did you attend secondary school? _____
   What language did you use at school? _____

6. Where did you attend college? _____
   What language or languages do you use in class? _____

7. How long have you been in the Netherlands? _____

8. Your native language is _____
   Your parent(s) language is Mother _____
   Father _____

9. Do you have native English speakers in your family? Y / N

10. At what age did you start *learning* English? _____
    In what kind of environment did you start using English?
    at school Y / N
    at home Y / N
    with friends? Y / N

11. At what age did you start *using* English? _____
    In what kind of environment did you start using English?
    at school Y / N

at home Y / N
with friends Y / N

12. Do you have a job? Y / N
What language do you usually use at work? _____

13. Are you a student? Y / N
What language do you usually use in class? _____

14. How many years experience do you have with English? _____

15. Which language do you speak the most often?
at home _____
at school or work _____
with friends _____

16. Do you have any experience living in China? Y / N How long? ____

17. Do you have any experience living in the Netherlands? Y / N How long ? ____

18. Do you have any experience living in the USA? Y / N How long ? ____

19. Do you have any experience living in other English-speaking countries? Y / N
How long? ____

20. Do you think your English is good enough for communication? Y / N

**Thank you for your cooperation!**

**Appendix A4.4. Instructions**

**Instructions part one: Vowels**

In the first part of the test your task is to decide which one of 19 different mono-syllabic words you heard. The words always begin with an *h* and end in a *d*. They differ in the vowel or in the presence of an *r*-sound right after the vowel. Here is a list of the 19 words that you may choose from:

| | *test word* | *rhymes with* | | *test word* | *rhymes with* |
|---|---|---|---|---|---|
| 1. | h**ee**d | f**ee**d, n**ee**d | 11. | h**oe**d | r**oa**d, sh**ow**ed |
| 2. | h**i**d | m**i**d, k**i**d | 12. | h**u**d | m**u**d, bl**oo**d |
| 3. | h**ay**ed | pl**ay**ed, st**ay**ed | 13. | h**ear**d | b**ir**d, w**or**d |
| 4. | h**ea**d | r**e**d, b**e**d | 14. | h**i**de | sl**i**de, r**i**de |
| 5. | h**ar**d | c**ar**d, b**ar**red | 15. | h**oy**ed | t**oy**ed, empl**oy**ed |
| 6. | h**a**d | b**a**d, s**a**d | 16. | h**ow**'d | l**ou**d, all**ow**ed |
| 7. | wh**o'**d | gl**ue**d, r**u**de | 17. | h**ere**'d | b**ear**d, sn**eer**ed |
| 8. | h**oo**d | g**oo**d, w**oo**d | 18. | h**oor**ed | t**oure**d, m**oore**d |
| 9. | h**aw**ed | s**aw**ed, fr**au**d | 19. | h**air**ed | sh**are**d, c**are**d |
| 10. | h**o**d | g**o**d, n**o**d | | | |

In spite of what you may think, each of the 19 words in bold face has a different pronunciation. Please take a minute to study the 19 test-words as they are listed from left to right on your answer sheet (i.e. in the order 1 through 19 in the above table). In order to know how to pronounce the 19 words, carefully study the rhyming words following the test words. Obviously, except for the consonants preceding the vowel, the test words and the rhyming words following it have exactly the same pronunciation.

In the actual test on the tape you will hear six different speakers. Two speakers are native American, two are Dutch, and two are Chinese. Each speaker pronounces each of the 19 test words (or word combinations) that begin with ***h*** and end with ***d***:

heed, hid, head, had, hard, hawed …

We are going to start the tape for a short practice run. You will hear ten words for practice. After each word you should indicate on your answer sheet, by ticking the appropriate box, which of the 19 words you think the speaker intended. **Note that you must make a choice, and one choice only, for each word on the tape.** If you really cannot decide which word you heard, then just gamble.

[ …….]

The words are played to you at a rate of one every six seconds and the speakers vary at random from one word to the next.

If you have no further questions with respect to the test procedure, we will switch on the tape for the actual test. To help you keep track on your answer sheets, there will be a short beep after every fifth word on the tape. There will be 120 words all together; this part of the test will take about 15 minutes.

**Instructions part two: Consonants**

In this part of the test your task is decide which one of 24 different monosyllabic nonsense words you heard. The words always begin with ***a*** and end in ***a***. They differ only in consonants in the middle. Here is a list of the 24 nonsense words with consonants that you may choose from; in order to make you clear about every consonant we provide some real words with the same consonants you are familiar with in the second column:

| | *test word* | *same consonant as in* | | *test word* | *same consonant as in* |
|---|---|---|---|---|---|
| 1. | a**p**a | **p**en, **p**ea | 13. | a**h**a | **h**e, **h**i, |
| 2. | a**b**a | **b**ee, **b**y | 14. | a**r**a | **r**ed, **r**ose |
| 3. | a**t**a | **t**ea, **t**o | 15. | a**f**a | **f**at, **f**oot |
| 4. | a**d**a | **d**esk, **d**id | 16. | a**v**a | **v**ase, **v**est |
| 5. | a**k**a | **k**iss, **k**ey | 17. | a**ch**a | **ch**air, **ch**eese |
| 6. | a**g**a | **g**ate, **g**o | 18. | a**j**a | **j**am, **j**ar |
| 7. | a**s**a | **s**ea, **s**ee | 19. | a**m**a | **m**um, **m**y |
| 8. | a**z**a | **z**oo, **z**ero | 20. | a**n**a | **n**ice, **n**ight |
| 9. | a**sh**a | **sh**y, **sh**e | 21. | a**ng**a | ha**ng**er, |
| 10. | a**zh**a | plea**s**ure, A**s**ia | 22. | a**l**a | **l**ie, **l**ay |
| 11. | a**th**a | **th**in, **th**ink | 23. | a**y**a | **y**es, **y**et |
| 12. | a**dh**a | **th**at, **th**ose | 24. | a**w**a | **w**as, **w**ar |

Please take a minute to study the 24 test "words" as they are listed left to right on your answer sheet (in the same order from 1 to 24 as in the table above). Make sure that you understand which consonant sound is intended in each nonsense word, and know (roughly) where each word is in the order from left to right – so that you will be able to work quickly once the tape starts.

In the actual test on the tape you will hear six different speakers. They are the same speakers as in the first part. Each speaker pronounces each of the 24 test words that begin with *a* and end in *a*:

apa, aba, ada, ata,……..

Speakers will alternate randomly on the tape. Your task is to decide for each nonsense word on the tape which consonant occurs between the vowels. Indicate your answer by ticking the appropriate box. Note that you must make a choice, and one choice only, for each word on the tape. If you really cannot decide which consonant you heard, then just gamble.

We will now play the first part of the tape for practice, just to familiarize you with your task and its time constraints.

[…….]

If you have no further questions with respect to the test procedure, we will switch on the tape for the actual test. To help you keep track on your answer sheets, there will be a short beep after every fifth word on the tape. There will be 150 items all together; this part of the test will take just within15 minutes.

**Instructions part three: Consonant Clusters**

Consonants in English sometimes occur in combinations (pairs or even triplets) at the beginning of words, e.g. in *plane*, *blue*, *pray, bread. Pl, bl, pr* and *br* in these words are called consonant clusters. On the tape you will hear 21 nonsense words with clusters, all of them between vowels *a*. The intended pronunciation of each cluster is also illustrated by words you are familiar with in the second column in the form:

| | *test word* | *as pronounced in* | | *test word* | *as pronounced in* |
|---|---|---|---|---|---|
| 1. | a**pl**a | **pl**ane, **pl**ay | 11. | a**spr**a | **spr**ing, **spr**ead |
| 2. | a**bl**a | **bl**ue, **bl**ow | 12. | a**spl**a | **spl**it, **spl**endid |
| 3. | a**pr**a | **pr**ay, **pr**ice | 13. | a**scr**a | **scr**eam, de**scr**ibe |
| 4. | a**br**a | **br**ead, **br**ing | 14. | a**sp**a | **sp**eak, **sp**eed |
| 5. | a**tr**a | **tr**ee, **tr**y | 15. | a**st**a | **st**ar, **st**ay |
| 6. | a**dr**a | **dr**y, **dr**iver | 16. | a**sc**a | **sc**ale, **sc**hool |
| 7. | a**cr**a | **cr**y, **cr**eam | 17. | a**sm**a | **sm**all, **sm**art |
| 8. | a**gr**a | **gr**ey, **gr**een | 18. | a**sn**a | **sn**ake, **sn**eeze |
| 9. | a**cl**a | **cl**ass, **cl**ean | 19. | a**sl**a | **sl**ow, **sl**im |
| 10. | a**gl**a | **gl**ass, **gl**ue | 20. | a**sw**a | **sw**eat, **sw**im |
| | | | 21. | a**thr**a | **thr**ough **th**row |

Please take a minute to study the 21 consonant clusters listed in the nonsense words in the table above and on your answer sheets. Both in the table and on your answer sheets the clusters will be listed in the same order from 1 to 21).

apla, abla, apra, abra,……

In this part of the experiment your task is to indicate which consonant pair or triplet you heard in each of a series of nonsense words.

You will now hear a practice run of 10 nonsense words. Indicate your answer by ticking the appropriate box. Note that you must make a choice, and one choice only, for each word on the tape. If you really cannot decide which consonant you heard, then just gamble.

If there are no further questions regarding the procedure, we will now proceed with the actual test. There will be 130 items; this part of the test will take about 10 minutes.

You will have about 5 seconds to make your choice; there will be a beep after every fifth item.

**Instructions part four: Nonsense Sentences**

In this part you are going to hear 30 sentences read by the same six speakers as in parts one, two and three. All the sentences are nonsense sentences with very simple words you are familiar with.

e.g. The grass lied on the blue night.
The short field said the air.
Show the plant or the sound.
How does the chance plan the cold fear?
The lost paid the moon that worked.

You can see that in the listed sentences there are no difficult words. In the test we leave the important words in every sentence blank on the answer sheet, e.g. the sentence:

*The grass lied on the blue night.*

will be printed on the answer sheet as

*The _____ _____ on the _____ _____.*

Your task is to listen to the tape and fill in the blanks with the words you hear on the tape.

Every sentence will be played three times in a row. During the second presentation there will pause of 3 seconds after ***every*** blanked-out word, which will allow you sufficient time to fill in the blanks. During the third (uninterrupted) presentation you can then check your answers and spelling, and make last-minute changes. Be sure to write clearly, please.

If you have no further questions with respect to the test procedure, I will now switch on the tape for a series of five practice items (fill in the blanks below).

a. The _____ _____ from the _____ _____.

b. The _____ _____ _____ the _____.

c. _____ the _____ or the _____.

d. How does the _____ _____ the _____ _____?

e. The _____ _____ the _____ that _____.

If there are no further questions regarding the procedure, we will now switch on the tape for the actual test. There will be 30 items all together; this part of the test will take just under 10 minutes.

**Instructions part five: Meaningful sentences**

In this final section you are going to hear 50 sentences read by the same six speakers that you heard before. They are all meaningful sentences with every-day words in them.

In this test, your task is to write down on your answer sheet for each sentence on the tape **only the last word you hear**. Note that last word of any test sentence is **always a one-syllable word**.

Each sentence will be read **only once** with a short pause in between sentences.

Please, write clearly. Do not leave items blank. If you do not recognize a word, then just write down any word that comes close to the sounds you heard on the tape.

If you have no further questions with respect to the test procedure, we will switch on the tape for the actual test. There will be no practice items this time. To help you keep track on your answer sheets, there will be a short beep after every fifth sentence on the tape. This part of the test will take less than 10 minutes.

**Appendix A6.1. Percent correct vowel identification broken down by language background of listener and of speaker. Mean, number of observations, standard deviation and standard error of the mean are indicated.**

| Nationality of | | Mean | N | SD | Se |
|---|---|---|---|---|---|
| Listener | Speaker | | | | |
| Chinese | Chinese | 29.2 | 1368 | 45.5 | 1.2 |
| | Dutch | 33.8 | 1368 | 47.3 | 1.3 |
| | USA | 32.9 | 1368 | 47.0 | 1.3 |
| | Total | 32.0 | 4104 | 46.7 | .7 |
| Dutch | Chinese | 40.3 | 1368 | 49.1 | 1.3 |
| | Dutch | 59.5 | 1368 | 49.1 | 1.3 |
| | USA | 58.6 | 1368 | 49.3 | 1.3 |
| | Total | 52.8 | 4104 | 49.9 | .8 |
| USA | Chinese | 44.7 | 1368 | 49.7 | 1.3 |
| | Dutch | 61.1 | 1368 | 48.8 | 1.3 |
| | USA | 75.4 | 1368 | 43.1 | 1.2 |
| | Total | 60.4 | 4104 | 48.9 | .8 |
| Total | Chinese | 38.1 | 4104 | 48.6 | .8 |
| | Dutch | 51.5 | 4104 | 50.0 | .8 |
| | USA | 55.6 | 4104 | 49.7 | .8 |
| | Total | 48.4 | 12312 | 50.0 | .5 |

**Appendix A6.2. Confusion matrices for vowels of each of nine combinations of speaker and listener nationality.**

Table A6.2.1. Vowel identification (%): Chinese listeners – Chinese speakers.

| | | Response vowel | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | i: | ɪ | e: | ɛ | ɑ: | æ | u: | ʊ | ɔ: | ɔ | o | ʌ | ʌr | ai | ɔi | ɑu | iə | uə | ɛə |
| Stimulus vowel | i: | **39** | 32 | 4 | 4 | 3 | 1 | 1 | | 4 | | | | | 4 | 1 | | 3 | | 1 |
| | ɪ | 38 | **40** | 1 | 3 | 1 | | 3 | | 1 | | 1 | 1 | | 6 | 1 | | 3 | | |
| | e: | 11 | 15 | **44** | 9 | 2 | 1 | | | 6 | 1 | | 1 | 1 | 5 | 2 | | 1 | 2 | |
| | ɛ | 1 | 3 | 6 | **19** | 6 | 22 | | | 11 | | | 1 | 1 | 19 | 1 | 6 | | 1 | 1 |
| | ɑ: | | | | 1 | **58** | 3 | 1 | 1 | 4 | 3 | | 10 | 8 | 1 | 1 | 6 | | 1 | |
| | æ | | 3 | 4 | 29 | 1 | **24** | | 3 | 1 | | 1 | | 6 | 25 | | 1 | | | 1 |
| | u: | | | | 1 | | | **29** | 28 | 1 | 8 | 3 | 13 | | 1 | | 1 | 4 | 10 | |
| | ʊ | | 4 | | | 3 | | 22 | **44** | | 4 | | 15 | 3 | | 1 | 1 | | 1 | |
| | ɔ: | | | | 3 | 47 | 1 | | 4 | **11** | 7 | 1 | 4 | 1 | | 1 | 18 | | | |
| | ɔ | | 3 | | 4 | 15 | | 3 | 3 | 21 | **7** | 4 | 7 | 1 | | 1 | 21 | 3 | 6 | 1 |
| | o | | | | | 1 | | 11 | 22 | 1 | 4 | **33** | 10 | | | 7 | | 1 | 8 | |
| | ʌ | | 4 | 1 | 19 | 36 | 10 | | 2 | 1 | 5 | | **17** | 1 | 2 | | 2 | 1 | 1 | |
| | ʌr | 1 | | | 4 | 4 | 1 | 1 | | 4 | 1 | | 1 | **60** | | | 1 | 13 | 3 | 4 |
| | ai | 42 | 39 | 4 | 3 | | | | | | 1 | | | 1 | **3** | 1 | | 3 | 1 | 1 |
| | ɔi | | 1 | 3 | | 34 | 7 | 6 | | 4 | 6 | | 6 | 1 | 11 | **10** | 1 | 3 | 1 | 6 |
| | ɑu | | 1 | 3 | | 19 | | 1 | 3 | 14 | 6 | 3 | | | | 7 | **36** | 1 | 6 | |
| | iə | 3 | | | 3 | | | | 1 | | | 1 | | 22 | 1 | | | **60** | 1 | 7 |
| | uə | | | | 1 | 6 | 1 | 4 | 1 | 15 | 11 | 4 | 4 | 11 | | 10 | 4 | 3 | **24** | |
| | ɛə | | | | 3 | 60 | 3 | 1 | 1 | 3 | 4 | 1 | 6 | 4 | 1 | 3 | 6 | | | **4** |

Table A6.2.2. Vowel identification (%): Chinese listeners – Dutch speakers.

| | | Response vowel | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | i: | ɪ | e: | ɛ | ɑ: | æ | u: | ʊ | ɔ: | ɔ | o | ʌ | ʌr | ai | ɔi | ɑu | iə | uə | ɛə |
| Stimulus vowel | i: | **39** | 43 | 1 | 1 | | 1 | | 1 | | | | | 3 | 4 | 1 | | 1 | 1 | 1 |
| | ɪ | 17 | **46** | 10 | 6 | 1 | 3 | | | 1 | 1 | | 1 | 1 | 8 | | | 3 | | 1 |
| | e: | 18 | 18 | **35** | 4 | | 1 | 3 | 3 | 3 | | 3 | 1 | 1 | 3 | | 3 | 4 | | |
| | ɛ | 1 | 4 | 3 | **44** | 3 | 26 | 1 | | 1 | | 3 | 1 | | 6 | | 1 | 1 | | 3 |
| | ɑ: | | | | 1 | **49** | 1 | 3 | 3 | 3 | 10 | | 18 | 4 | 1 | | 3 | 1 | 1 | 1 |
| | æ | 3 | 5 | | 46 | 3 | **23** | 1 | | 1 | | 1 | 2 | 2 | 6 | 2 | 1 | | 1 | 4 |
| | u: | | | 1 | 1 | | 1 | **38** | 38 | | 3 | 3 | 11 | | 1 | 1 | | | 1 | |
| | ʊ | | | 1 | | | 1 | 23 | **39** | 1 | 3 | 1 | 14 | 1 | 1 | | 1 | | 11 | |
| | ɔ: | 1 | | | 3 | | | 10 | 13 | **10** | 15 | 22 | 3 | 1 | 3 | 8 | 4 | 1 | 4 | 1 |
| | ɔ | | | 1 | 1 | 31 | | 4 | 3 | 6 | **29** | 8 | 6 | 3 | 1 | 1 | 4 | | 1 | |
| | o | | | 1 | | 1 | | 3 | 6 | 4 | 11 | **53** | 1 | 1 | | 4 | 13 | | 1 | |
| | ʌ | | 1 | 1 | 3 | 40 | 1 | 3 | 3 | 1 | 13 | 3 | **14** | | 3 | 3 | 7 | 1 | 3 | |
| | ʌr | 4 | 1 | | 3 | 3 | 1 | 6 | 8 | 3 | 1 | 1 | 8 | **50** | 1 | | 1 | 1 | 4 | 1 |
| | ai | 10 | 40 | 14 | 7 | 1 | 3 | | 1 | 4 | | 1 | 1 | 3 | **6** | 1 | 1 | 4 | 1 | |
| | ɔi | | | 4 | 4 | 3 | 3 | 1 | 1 | 4 | 6 | 11 | 4 | 6 | 8 | **28** | 6 | 1 | 6 | 4 |
| | ɑu | | | 1 | 1 | 5 | 1 | 2 | 3 | 19 | 9 | 3 | 1 | | 1 | 7 | **40** | 2 | 4 | 2 |
| | iə | | 3 | 3 | 6 | 3 | 1 | 1 | 6 | | 3 | 1 | 1 | 21 | | | 4 | **42** | | 6 |
| | uə | 1 | | | 4 | | 3 | 15 | 8 | 11 | 4 | 1 | 14 | 1 | 1 | 1 | 7 | 4 | **19** | 3 |
| | ɛə | | | 6 | 31 | 1 | 8 | | | | | | | 8 | 3 | | | 4 | 1 | **38** |

Table A6.2.3. Vowel identification (%): Chinese listeners – American speakers.

| Stimulus vowel \ Response vowel | iː | ɪ | eː | ɛ | ɑː | æ | uː | ʊ | ɔː | ɔ | o | ʌ | ʌr | ai | ɔi | ɑu | iə | uə | ɛə |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| iː | **28** | 50 | 4 | | | 1 | 1 | | | 3 | 1 | 1 | | 1 | | 1 | 7 | | |
| ɪ | 6 | **38** | 8 | 28 | 3 | 7 | | 1 | 3 | | 1 | | | 3 | | | 1 | | 1 |
| eː | 7 | 19 | **21** | 18 | 3 | 3 | | 4 | 3 | | 1 | | 3 | 1 | | | 11 | | 6 |
| ɛ | 1 | 3 | 1 | **69** | 1 | 14 | | | | | 3 | | 1 | 3 | | | | 1 | 1 |
| ɑː | | 7 | | 3 | **58** | 3 | 1 | | | 1 | 3 | 10 | 10 | 1 | | 1 | | | 1 |
| æ | 3 | 3 | 6 | 36 | 15 | **28** | 1 | 3 | | | 1 | 3 | 1 | | | | | | |
| uː | | 1 | 1 | 1 | 1 | | **35** | 31 | 3 | 7 | | 6 | 1 | | | 1 | 3 | 8 | |
| ʊ | 1 | 3 | | 3 | 1 | 3 | 10 | **18** | 3 | 7 | 4 | 17 | 25 | | | 3 | 1 | 1 | |
| ɔː | 1 | | | 3 | 68 | 3 | | 3 | **4** | 10 | | 4 | 3 | | | | | 1 | |
| ɔ | | 3 | 4 | 6 | 46 | 2 | | 1 | 3 | **11** | | 10 | 4 | 4 | 3 | | 1 | | 3 |
| o | | 1 | | 1 | | | 3 | 6 | 6 | 18 | **44** | 1 | | 1 | 10 | 3 | 1 | 4 | |
| ʌ | 1 | | | 6 | 13 | 1 | 3 | 8 | 3 | 14 | 3 | **13** | 35 | | | | 1 | | |
| ʌr | | 1 | 1 | 8 | 3 | | | | | 1 | | 1 | **64** | 1 | 1 | 1 | 10 | 3 | 3 |
| ai | 8 | 51 | 3 | 24 | | 3 | | 1 | | 1 | 1 | 1 | | **6** | | | | | |
| ɔi | | 2 | 2 | 1 | | 2 | 2 | 2 | 7 | 2 | 7 | 1 | | 2 | **59** | 3 | | 7 | 1 |
| ɑu | | | 1 | 1 | 4 | | 1 | 3 | 29 | 10 | 6 | 4 | 1 | 1 | 6 | **25** | | 6 | 1 |
| iə | 1 | 3 | | 3 | 4 | | | 3 | | | 1 | 1 | 18 | | 1 | 3 | **57** | | 4 |
| uə | | | | 1 | 13 | 3 | 6 | 8 | 6 | 7 | 3 | 17 | 8 | 1 | 1 | 4 | | **22** | |
| ɛə | 3 | 8 | 3 | 10 | 1 | 3 | | 1 | 1 | | 3 | 1 | 10 | 3 | 1 | 1 | 22 | 1 | **26** |

Table A6.2.4. Vowel identification (%): Dutch listeners – Chinese speakers.

| Stimulus vowel \ Response vowel | iː | ɪ | eː | ɛ | ɑː | æ | uː | ʊ | ɔː | ɔ | o | ʌ | ʌr | ai | ɔi | ɑu | iə | uə | ɛə |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| iː | **75** | 10 | | 3 | 1 | 1 | | | | 3 | 1 | | 1 | | | | 4 | | |
| ɪ | 57 | **23** | | 4 | | | | 1 | | 1 | 1 | | 1 | 3 | | | 7 | | |
| eː | 1 | | **81** | 4 | 1 | 1 | 1 | | 5 | | | | 1 | 1 | 1 | 2 | 1 | | 1 |
| ɛ | | 3 | 1 | **4** | | 6 | | | | | | | | 86 | | | | | |
| ɑː | | | 1 | | **63** | 10 | 1 | 3 | 1 | 6 | | 3 | 4 | | 1 | 3 | | 3 | 1 |
| æ | | | 3 | 22 | | **23** | | 1 | | 3 | | | | 46 | | | 1 | | |
| uː | | | | | | | **31** | 47 | | | 15 | | 1 | | | | | 6 | |
| ʊ | | | | | 1 | | 26 | **60** | 1 | 3 | 6 | 1 | | | | | | 1 | |
| ɔː | | | 2 | | 18 | | | 2 | **6** | 3 | 2 | 3 | 2 | 29 | 6 | 29 | | | |
| ɔ | | | | | 20 | 1 | | | 13 | **19** | 1 | 4 | 4 | | | 37 | | | |
| o | 1 | | | 4 | | 1 | 11 | 37 | 4 | 9 | **20** | 1 | | | 7 | 1 | | 1 | |
| ʌ | | 3 | | 16 | 1 | 59 | | | 1 | 3 | | **8** | 1 | 1 | 3 | 2 | 1 | | 2 |
| ʌr | | | | | 25 | | | | | 1 | | | **59** | | | | 4 | 9 | 1 |
| ai | | 6 | 1 | 1 | 3 | 8 | | | 1 | | | | 3 | **74** | 3 | | | | |
| ɔi | 1 | 4 | 4 | 1 | 1 | | | 3 | 1 | 1 | | | 1 | 46 | **33** | | | 1 | |
| ɑu | | | | 1 | 10 | 1 | 3 | | 7 | 21 | | 1 | 1 | | 1 | **47** | 1 | 3 | |
| iə | | | | | | | | | 1 | | | | 49 | | | | **44** | 1 | 4 |
| uə | | | | | 1 | | | 3 | 3 | 1 | | | 3 | | 1 | | | **86** | 1 |
| ɛə | | | | | 38 | | | | 3 | | | 1 | 23 | 1 | 1 | | 4 | 1 | **26** |

Table A6.2.5. Vowel identification (%): Dutch listeners – Dutch speakers.

| | | Response vowel | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | iː | ɪ | eː | ɛ | ɑː | æ | uː | ʊ | ɔː | ɔ | o | ʌ | ʌr | ai | ɔi | ɑu | iə | uə | ɛə |
| Stimulus vowel | iː | **70** | 7 | 1 | 9 | | | | 1 | | 1 | 1 | | 1 | | 4 | | 3 | | |
| | ɪ | 4 | **94** | | | | | | | | | | | | 1 | | | | | |
| | eː | 1 | 1 | **79** | 1 | | 1 | | | 1 | | | 1 | | 1 | 4 | 4 | | | 1 |
| | ɛ | | 3 | | **68** | | 27 | | 1 | | | | 1 | | | | | | | |
| | ɑː | | | | 1 | **58** | 18 | | 1 | 1 | 15 | | 1 | 1 | | 1 | | | | |
| | æ | | 2 | | 50 | 1 | **39** | | | | | 1 | 1 | 1 | | 4 | 1 | | | |
| | uː | | 1 | | | | | **42** | 42 | | | 3 | 3 | | 1 | | 6 | | 1 | |
| | ʊ | | | | | 3 | | 31 | **54** | 1 | 3 | 4 | | | | | 3 | | | |
| | ɔː | 1 | | | | | | 1 | 12 | **24** | 16 | 25 | | 1 | | 3 | 12 | | 3 | 1 |
| | ɔ | | | | | 6 | 4 | | 3 | 3 | **75** | 3 | 7 | | | | | | | |
| | o | | | | | | | 6 | 7 | 19 | 10 | **33** | | | | 9 | 16 | | | |
| | ʌ | | 1 | | | 13 | 37 | | | 1 | 19 | | **26** | | | | 3 | | | |
| | ʌr | 1 | | | 1 | | | 1 | 3 | | | 4 | 7 | **78** | | | | 3 | 1 | |
| | ai | 3 | 4 | 7 | | 1 | 1 | | | | | 1 | | | **81** | 1 | | | | |
| | ɔi | 1 | | | | | | | | 10 | 3 | | | | 8 | **77** | | | | |
| | ɑu | | | | | 2 | 2 | 2 | 1 | 11 | 2 | 5 | | | | 4 | **70** | 1 | | |
| | iə | | | | 1 | 1 | | | 1 | | | | | 36 | | | | **51** | 1 | 7 |
| | uə | | | 6 | | | | 1 | 4 | | | 4 | 1 | | 1 | 1 | 7 | | **73** | |
| | ɛə | | | 1 | 3 | | | 1 | | | | | | 21 | 1 | | | 8 | | **63** |

Table A6.2.6. Vowel identification (%): Dutch listeners – American speakers.

| | | Response vowel | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | iː | ɪ | eː | ɛ | ɑː | æ | uː | ʊ | ɔː | ɔ | o | ʌ | ʌr | ai | ɔi | ɑu | iə | uə | ɛə |
| Stimulus vowel | iː | **60** | 19 | 1 | 9 | | | | | | | | 1 | 4 | 1 | | | 3 | | 1 |
| | ɪ | | **86** | | 7 | 1 | 3 | | | | | | | 1 | 1 | | | | | |
| | eː | 3 | 1 | **40** | 24 | | 9 | | 1 | 4 | 3 | | | 6 | | | | 4 | | 4 |
| | ɛ | | 3 | | **82** | | 13 | | | | | | 3 | | | | | | | |
| | ɑː | | | | 1 | **92** | 1 | | | | | | | 3 | | | | | | 3 |
| | æ | | 1 | | 36 | 3 | **53** | 1 | | | | 1 | | 3 | | | | | | 1 |
| | uː | | | 3 | | | | **46** | 38 | | | 8 | | | | | 3 | | 3 | |
| | ʊ | | | | | | | | **72** | | 3 | 6 | 14 | 4 | | | | | | 1 |
| | ɔː | | | 1 | | 31 | 15 | | 1 | **10** | 29 | 1 | 7 | | 3 | | 1 | | | |
| | ɔ | | 1 | 2 | 1 | 41 | 11 | | | 2 | **30** | 2 | 7 | | 2 | 1 | 1 | | | |
| | o | | | | 1 | | 1 | 4 | 6 | 13 | 3 | **41** | | | | 6 | 18 | | 6 | |
| | ʌ | | | | 4 | | 3 | 4 | 38 | | 10 | 3 | **29** | 8 | | | | 1 | | |
| | ʌr | 1 | 1 | | 3 | | | | | | | | | **87** | | | | 4 | 1 | 1 |
| | ai | 3 | 3 | 1 | 1 | | | | | | | 1 | | 3 | **86** | 1 | | | | |
| | ɔi | | | 1 | 1 | | | 1 | | 1 | | 3 | 1 | | 1 | **91** | | | 1 | |
| | ɑu | | | | | | | 6 | | 7 | | 3 | | | | 4 | **78** | | 1 | |
| | iə | | | | 1 | 1 | 3 | | | | | 1 | 1 | 53 | | 1 | | **33** | 3 | 1 |
| | uə | | | | | 6 | | 1 | 6 | | 6 | 4 | | 4 | 1 | 1 | 3 | | **66** | 1 |
| | ɛə | | 1 | 1 | 1 | | | | | 1 | | | | 32 | | | | 13 | | **49** |

Table A6.2.7. Vowel identification (%): American listeners – Chinese speakers.

| | | Response vowel | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | i: | ɪ | e: | ɛ | ɑ: | æ | u: | ʊ | ɔ: | ɔ | o | ʌ | ʌr | ai | ɔi | ɑu | iə | uə | ɛə |
| Stimulus vowel | i: | **71** | 25 | 1 | | 1 | | | | | 1 | | | | | | | | | |
| | ɪ | 53 | **36** | 1 | | | | | 6 | | 3 | | | | | | | | 1 | |
| | e: | 1 | | **85** | 4 | | 1 | | | | 1 | | | | 2 | 2 | 4 | | 1 | |
| | ɛ | | 3 | 8 | **10** | 3 | 7 | | | | | | 1 | 1 | 63 | 1 | 1 | | | |
| | ɑ: | | | 1 | | **52** | 10 | 1 | | 7 | 13 | | 3 | 9 | | | | | 3 | |
| | æ | | | 6 | 4 | | **39** | 3 | | 1 | | | | | 46 | | | 1 | | |
| | u: | | 1 | 1 | | | | **45** | 39 | | | 3 | 1 | | | | 3 | 1 | 3 | |
| | ʊ | | | | 1 | 1 | 4 | 46 | **42** | | | | | | | | 4 | | | |
| | ɔ: | | 1 | 3 | | 10 | 1 | 3 | | **18** | | 1 | | 4 | 25 | 3 | 29 | | | |
| | ɔ | | | 2 | 2 | 6 | 2 | | | 18 | **26** | | | | | 2 | 42 | 2 | | |
| | o | 3 | | | 1 | 1 | 3 | 3 | 29 | 1 | 4 | **49** | | | 1 | | 3 | | | |
| | ʌ | | 1 | 1 | 1 | 6 | 69 | 1 | | 1 | 8 | | **9** | | 1 | 2 | | | | |
| | ʌr | | 1 | | | 14 | | | 4 | | | 1 | 1 | **68** | 1 | 1 | | 1 | 6 | |
| | ai | | 1 | 1 | | 4 | 20 | | | 4 | 3 | | 1 | | **61** | | 1 | 1 | | |
| | ɔi | | | 1 | 3 | 1 | | | | | | 4 | | | 37 | **51** | | | 3 | |
| | ɑu | 1 | | | 1 | | 1 | 1 | 1 | 21 | 19 | 1 | | 1 | 1 | 3 | **46** | | | |
| | iə | 1 | 1 | | | | | | | | | | | 21 | 1 | | | **70** | 1 | 3 |
| | uə | | | 1 | | 3 | 1 | | 1 | | | | | 7 | | 6 | 1 | | **79** | |
| | ɛə | | | | | 42 | 4 | | | 1 | | | | 25 | 1 | 4 | | 1 | | **20** |

Table A6.2.8. Vowel identification (%): American listeners – Dutch speakers.

| | | Response vowel | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | i: | ɪ | e: | ɛ | ɑ: | æ | u: | ʊ | ɔ: | ɔ | o | ʌ | ʌr | ai | ɔi | ɑu | iə | uə | ɛə |
| Stimulus vowel | i: | **82** | 10 | | 1 | | | | | | | 3 | | 1 | | | | 1 | | |
| | ɪ | 4 | **90** | | | | | | | | | | | 1 | 4 | | | | | |
| | e: | | 1 | **80** | 3 | 1 | | | | | 1 | 1 | | | | 1 | 6 | | 1 | 3 |
| | ɛ | | | 3 | **84** | | 10 | | | | | | | | | 3 | | | | |
| | ɑ: | | | 1 | | **48** | 7 | 1 | 4 | 13 | 14 | | | 6 | 1 | | 1 | 1 | | 1 |
| | æ | 1 | | 1 | 71 | | **21** | | | 1 | 1 | | | 1 | 1 | 2 | | | | |
| | u: | | | | | | 1 | **74** | 16 | | | 4 | | | 1 | | 1 | | 1 | |
| | ʊ | 1 | | | | 1 | 1 | 44 | **41** | | 3 | 1 | | 1 | | | 1 | | 4 | |
| | ɔ: | 4 | | | | 1 | | 4 | 13 | **16** | 3 | 47 | | 4 | 1 | 1 | 3 | | 1 | |
| | ɔ | | | 1 | | 7 | 1 | 1 | 8 | 10 | **52** | 7 | 4 | 1 | 1 | | | 3 | 1 | |
| | o | | | | 1 | | | | | | 1 | **74** | 1 | | | 10 | 6 | | 6 | |
| | ʌ | | 1 | 1 | 1 | 6 | 17 | | | 11 | 34 | 1 | **24** | 1 | | | | | | |
| | ʌr | | | | 2 | 2 | | 2 | 6 | | | | | **74** | 2 | | | 5 | 9 | |
| | ai | 3 | 6 | 4 | 1 | | 4 | | 1 | 1 | 1 | | | | **76** | | | | | 1 |
| | ɔi | | 1 | 1 | 1 | | | | | | 1 | 9 | | 3 | 4 | **78** | | | | |
| | ɑu | | | | | 1 | | 1 | | 4 | | | | | | 4 | **90** | | | |
| | iə | 1 | | | | | | 3 | | | | | | 20 | | | 1 | **67** | | 7 |
| | uə | | | 5 | | | | 3 | | 2 | 2 | | 2 | | | 2 | 8 | 3 | **76** | |
| | ɛə | | | | 6 | | 1 | | | | 1 | 1 | | 15 | 1 | | 3 | 7 | | **64** |

Table A6.2.9. Vowel identification (%): American listeners – American speakers.

| | | Response vowel | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Stimulus vowel | | i: | ɪ | e: | ɛ | ɑ: | æ | u: | ʊ | ɔ: | ɔ | o | ʌ | ʌr | ai | ɔi | ɑu | iə | uə | ɛə |
| | i: | **86** | 7 | | | | | | | | | | | 4 | 3 | | | | | |
| | ɪ | | **96** | | 3 | | | | | | | 1 | | | | | | | | |
| | e: | | 9 | **60** | 11 | 1 | 3 | 3 | 1 | | | | | 1 | | | 1 | 1 | | 7 |
| | ɛ | | | | **96** | | 1 | | 1 | | | | | 1 | | | | | | |
| | ɑ: | | | 1 | | **87** | 1 | | | 1 | | | | 7 | | | | 1 | | |
| | æ | | 1 | 3 | | 3 | **89** | | 1 | | 3 | | | | | | | | | |
| | u: | | | 1 | | | 1 | **82** | 10 | | | | 1 | | | | | | 3 | |
| | ʊ | | | | 1 | 1 | | | **86** | | | 3 | | 7 | | | | | | 1 |
| | ɔ: | 1 | | 3 | | 3 | 3 | 1 | | **39** | 45 | | | 3 | 1 | | | | | |
| | ɔ | | | 1 | 2 | 1 | 7 | | 2 | 29 | **46** | | 3 | 2 | 3 | 1 | 4 | | | |
| | o | | | | | | 1 | | | 1 | 7 | **81** | | | | 6 | 3 | | | |
| | ʌ | 1 | 1 | | 3 | | 1 | | 40 | | 4 | | **38** | 7 | 1 | | | 1 | 1 | |
| | ʌr | | | | 1 | 1 | | | | | 3 | | | **85** | 3 | | | 3 | 1 | 1 |
| | ai | 3 | 3 | 1 | | 1 | | | | | | 1 | | | **87** | | 1 | | 1 | |
| | ɔi | | | 1 | 1 | | | 2 | 3 | 1 | | 2 | | 1 | | **87** | 2 | | 1 | |
| | ɑu | | | | | | | | | 1 | | 1 | | | | 3 | **94** | | | |
| | iə | | 3 | 1 | 1 | 1 | 3 | | | | | | | 8 | 1 | | | **79** | 1 | |
| | uə | | | 1 | | 7 | | | | | | 1 | | 4 | 3 | | | | **82** | |
| | ɛə | | | 1 | | 1 | 1 | 1 | | | | | | 13 | | | | 3 | | **79** |

| | legend |
|---|---|
| | 0% |
| | 1- 10% |
| | 11- 20% |
| | 21- 30% |
| | 31- 40% |
| | 41- 50% |
| | 51- 60% |
| | 61- 70% |
| | 71- 80% |
| | 81- 90% |
| | 91-100% |

**Appendix A6.3. Dendrograms for 19 vowels for each of nine combinations of speaker and listener nationality.**

Figure A6.3.1. Chinese listeners – Chinese speakers

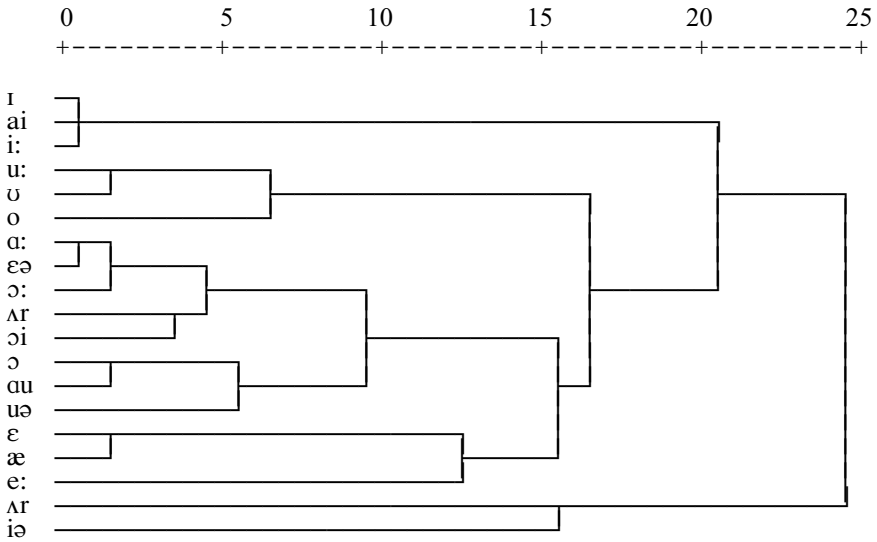



Figure A6.3.2. Chinese listeners – Dutch speakers

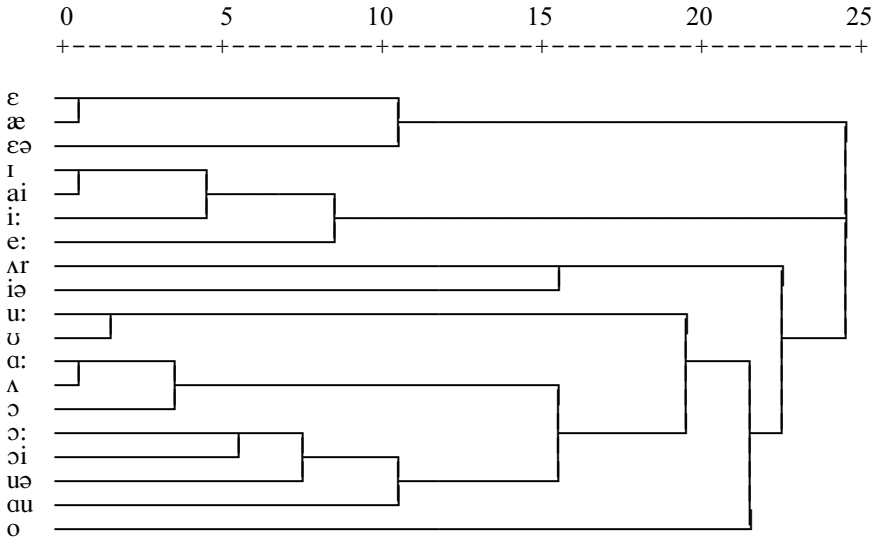


Figure A6.3.3. Chinese listeners – American speakers

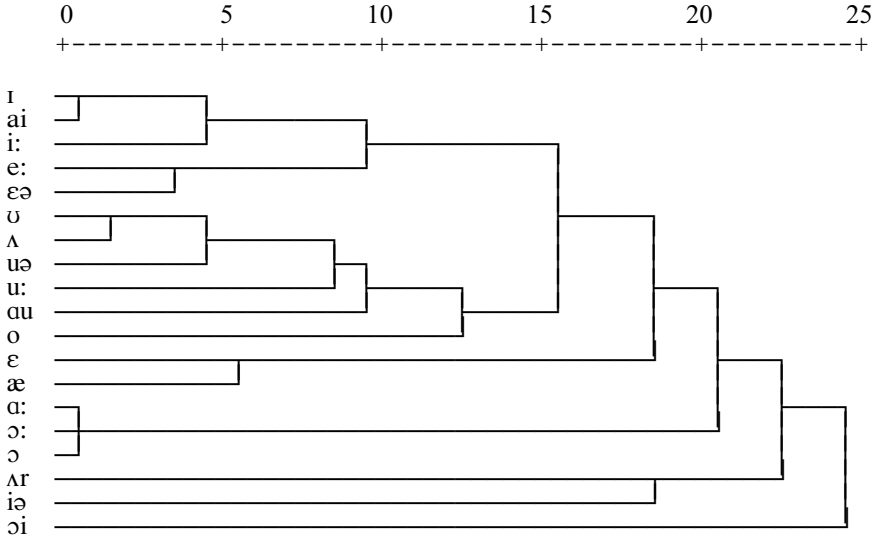



Figure A6.3.4. Dutch listeners– Chinese speakers

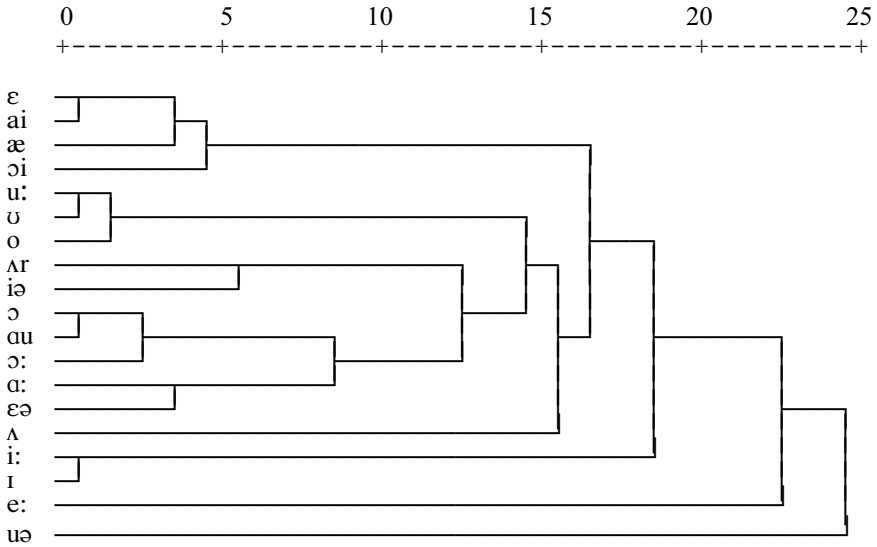


Figure A6.3.5. Dutch listeners – Dutch speakers

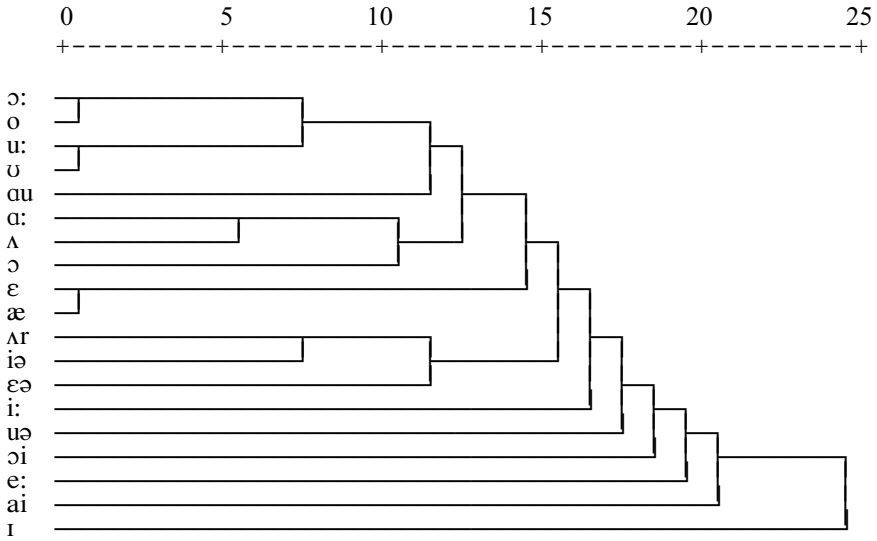



Figure A6.3.6. Dutch listeners – American speakers

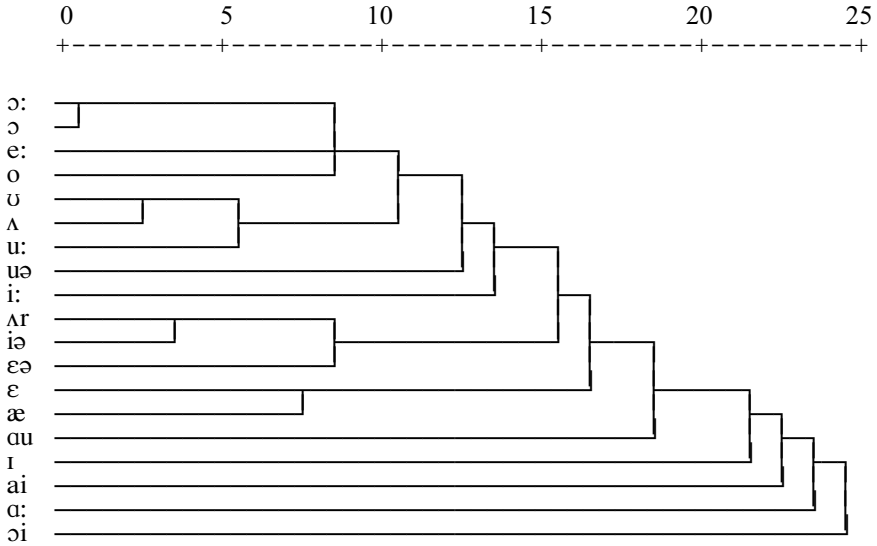


Figure A6.3.7. American listeners – Chinese speakers

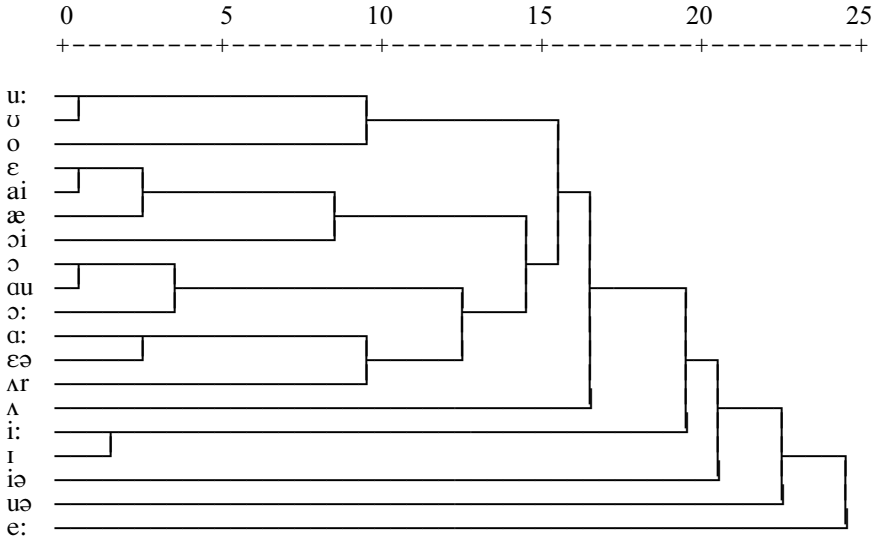



Figure A6.3.8. American listener – Dutch speaker

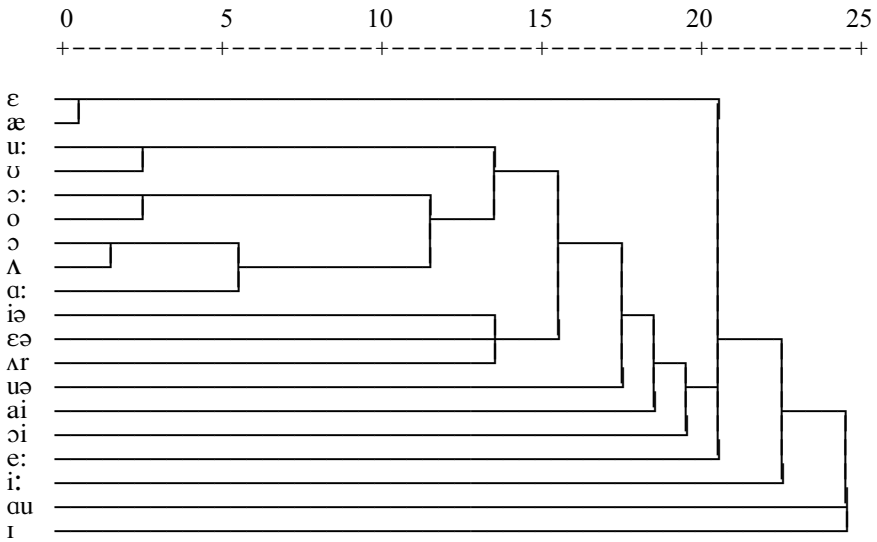
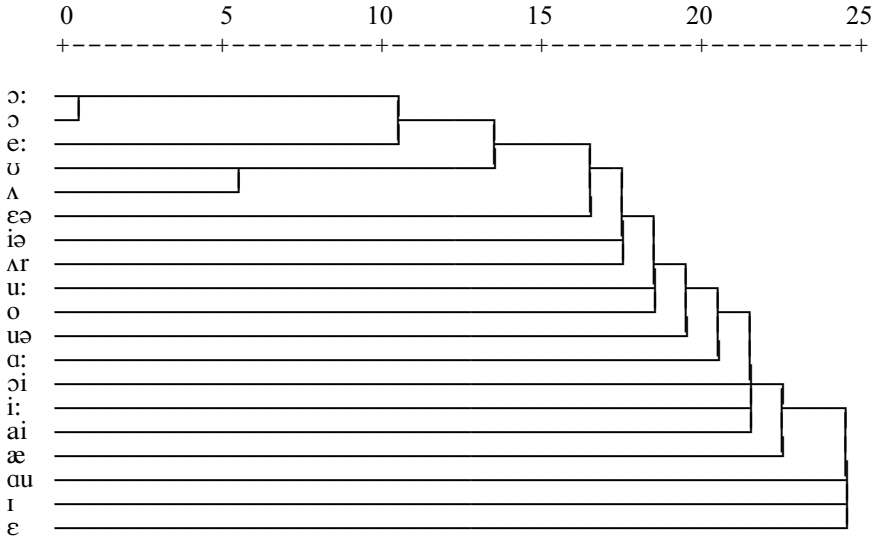


Figure A6.3.9. American listeners – American speakers



**Appendix A7.1 Percent correct consonant identification broken down by language background of listener and of speaker. Mean, number of observations, standard deviation and standard error of the mean are indicated.**

| Nationality of | | Mean | N | SD | Se |
|---|---|---|---|---|---|
| Listener | Speaker | | | | |
| Chinese | Chinese | 57.2 | 1800 | 49.5 | 1.2 |
| | Dutch | 46.8 | 1800 | 49.9 | 1.2 |
| | USA | 58.2 | 1800 | 49.3 | 1.2 |
| | Total | 54.1 | 5400 | 49.8 | .7 |
| Dutch | Chinese | 66.6 | 1800 | 47.2 | 1.1 |
| | Dutch | 73.7 | 1800 | 44.1 | 1.0 |
| | USA | 80.6 | 1800 | 39.5 | .9 |
| | Total | 73.6 | 5400 | 44.1 | .6 |
| USA | Chinese | 70.5 | 1850 | 45.6 | 1.1 |
| | Dutch | 74.1 | 1850 | 43.8 | 1.0 |
| | USA | 83.4 | 1850 | 37.2 | .9 |
| | Total | 76.0 | 5550 | 42.7 | .6 |
| Total | Chinese | 64.8 | 5450 | 47.8 | .6 |
| | Dutch | 64.9 | 5450 | 47.7 | .6 |
| | USA | 74.2 | 5450 | 43.8 | .6 |
| | Total | 68.0 | 16350 | 46.7 | .4 |

**Appendix A7.2 Confusion matrices for simplex consonants for each of nine combinations of speaker and listener nationality.**

Table A7.2.1. Simplex consonants (%): Chinese listeners – Chinese speakers.

| Stimulus Consonants \ Response Consonants | p | b | t | d | k | g | s | z | ʃ | ʒ | θ | ð | h | r | f | v | tʃ | dʒ | m | n | ŋ | l | y | w |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| p | **93** | 4 | | | | | | | 1 | | 1 | | | | | | | | | | | | | |
| b | 3 | **76** | | 1 | | | | | | | 1 | | | 4 | 1 | 4 | | | | | | 1 | | 7 |
| t | 31 | 1 | **54** | 3 | 3 | | | | | | 1 | | 6 | | | | | | | | 1 | | | |
| d | | 43 | 1 | **39** | | 4 | | 3 | | | 3 | 1 | | | | 3 | | | | | | 1 | | 1 |
| k | 7 | | | | **82** | 1 | 1 | | | | | | | 1 | 1 | 3 | 1 | | | | 1 | | | |
| g | | 39 | | 6 | | **43** | | | | | | | | 3 | | | | 4 | | | 4 | | | 1 |
| s | | 1 | | | 1 | 1 | **78** | 3 | 10 | 1 | 3 | 1 | | | | 1 | 1 | | | | | | | 1 |
| z | | | | | | | 1 | **71** | | 8 | 6 | 13 | | | | | | | | 1 | | | | |
| ʃ | | | | | | | 3 | | **89** | | 3 | | | | 1 | | 4 | | | | | | | |
| ʒ | | | | | | 3 | 1 | 21 | 1 | **28** | 3 | 4 | | | | | 1 | 36 | | | 1 | | | |
| θ | | 1 | | | | | 43 | | 4 | 1 | **8** | | | | 40 | 1 | | | | | | | | |
| ð | | 8 | | 22 | 1 | 15 | | 8 | | 3 | 4 | **7** | | | 3 | 8 | | 4 | | | | 4 | | 11 |
| h | 21 | | | | | | 1 | | | | | 6 | **68** | | 1 | 1 | | | | | | | | 1 |
| r | | | | | | | | 7 | | 17 | 1 | 6 | | **43** | | 6 | | 3 | 1 | | | 10 | 1 | 6 |
| f | | 3 | 1 | | | | | | 1 | | | | | | **92** | 3 | | | | | | | | |
| v | 1 | 13 | | 1 | | 1 | 1 | 1 | | | 1 | 1 | 1 | | | **32** | | | 1 | | | 1 | 1 | 40 |
| tʃ | | | | | 1 | | | 1 | | | 1 | 1 | 1 | | | | **92** | | | | | | | 1 |
| dʒ | | | | | | 1 | | 22 | | 18 | 1 | 3 | 1 | | | | 6 | **42** | 3 | | 1 | 1 | | |
| m | | 31 | | | | | | | | | | | | | | 3 | | 1 | **58** | 1 | | 1 | | 4 |
| n | | 1 | 1 | 8 | | 1 | | 3 | | 1 | | 3 | | | | 3 | | 1 | 4 | **42** | 3 | 25 | | 3 |
| ŋ | | | | 1 | 1 | 14 | | | | 8 | 1 | 3 | | 13 | 4 | 8 | | 6 | 11 | 3 | **4** | 15 | | 7 |
| l | | 1 | | | | | 1 | | | 1 | 1 | 1 | | 3 | | | | | | | 1 | 1 | **88** | | |
| y | | | | | 1 | 1 | | | | 3 | | | | 1 | | | | 7 | | 1 | | 26 | **58** | |
| w | | 3 | | | 1 | | | | | | | | | 1 | | 21 | | | 1 | 3 | | 4 | | **65** |

Table A7.2.2. Simplex consonants (%): Chinese listeners – Dutch speakers

| Stimulus Consonants \ Response Consonants | p | b | t | d | k | g | s | z | ʃ | ʒ | θ | ð | h | r | f | v | tʃ | dʒ | m | n | ŋ | l | y | w |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| p | **46** | 15 | 3 | 3 | 6 | 7 | | | | 1 | 1 | | 6 | | 4 | 1 | 1 | | 3 | | | | 3 | |
| b | | **46** | 1 | 1 | | | | | | 1 | 3 | 4 | 13 | | 1 | 11 | | | 8 | 1 | | 1 | | 7 |
| t | | 1 | **57** | 4 | 1 | | | | 4 | 1 | 6 | 6 | 1 | | 1 | | 14 | | | 1 | | 1 | | |
| d | 1 | 10 | 3 | **46** | | | | | | 3 | 4 | 8 | 7 | | | 1 | | | 1 | 1 | 11 | 1 | | 1 |
| k | 1 | | 3 | | **88** | | 1 | 1 | | 1 | | 1 | | | | 1 | | | | | 1 | | | |
| g | | | 4 | 4 | 8 | **53** | | 3 | | | 1 | 7 | 3 | 1 | | | | | | | 13 | | 1 | 1 |
| s | | | | | 1 | | **38** | 1 | 19 | 6 | 11 | 4 | 3 | | | | 10 | 6 | | | 1 | | | |
| z | | | 1 | | | 1 | 4 | **44** | 3 | 15 | 7 | 13 | | 1 | | | 3 | 4 | | | 3 | | | |
| ʃ | | | | | | | 3 | | **82** | 1 | 4 | 1 | | | | | 8 | | | | | | | |
| ʒ | | | 1 | | | 1 | 3 | 1 | 47 | **22** | 3 | 1 | | 4 | | | | 11 | | | 1 | | 3 | |
| θ | 3 | | | | | 1 | 10 | 1 | 1 | 4 | **8** | 14 | 13 | 1 | 33 | 3 | 1 | | | | 3 | 1 | 1 | |
| ð | 1 | | 7 | 19 | | 7 | 1 | 10 | 3 | 4 | 11 | **4** | 3 | 3 | 4 | 1 | | 6 | | | 6 | 7 | 3 | |
| h | | | | 1 | | | | | | | | | **93** | | | | 1 | | | | 1 | 1 | | 1 |
| r | 1 | | | 4 | | 1 | | 3 | | 3 | 4 | 4 | 4 | **40** | 1 | 7 | | 3 | | 1 | 6 | 7 | 3 | 7 |
| f | | | | 1 | | 1 | 3 | 1 | 3 | | 8 | | 4 | 1 | **71** | 3 | | | | | 3 | | | |
| v | 1 | 15 | 1 | | | | | | | 1 | 4 | 6 | 3 | 3 | 50 | **4** | | 1 | | | 3 | | 1 | 6 |
| tʃ | 1 | | 1 | | | | | 1 | 3 | 7 | 6 | | | 1 | | | **58** | 19 | | | | | 1 | |
| dʒ | | | | | 1 | 4 | | 4 | | 18 | 3 | | 1 | | | | 8 | **57** | | | 3 | | | |
| m | | 2 | | 1 | | | | | 1 | 2 | 1 | 1 | 18 | 1 | | 4 | 1 | | **47** | 1 | 10 | 6 | | 4 |
| n | 1 | | | 1 | | | | 3 | | 3 | 4 | 10 | 4 | 1 | | | | | | **36** | 6 | 28 | | 3 |
| ŋ | | | | 6 | 1 | 21 | 1 | | 1 | | 6 | | 4 | 3 | | 4 | | 3 | 1 | | **36** | 7 | 3 | 3 |
| l | 3 | 1 | | | | | | | | 1 | 3 | 1 | 8 | 1 | 1 | 1 | | | 3 | | 4 | **61** | | 10 |
| y | | | | | | | | | | 6 | | 1 | 3 | 7 | | | 1 | 15 | | | 1 | 1 | **64** | |
| w | | 1 | | | | 1 | 1 | | 4 | 3 | 1 | 4 | 14 | 4 | 1 | 32 | 1 | | 3 | 1 | | 3 | | **24** |

Table A7.2.3. Simplex consonants (%): Chinese listeners – American speakers

| Stimulus Consonants | Response Consonants | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | p | b | t | d | k | g | s | z | ʃ | ʒ | θ | ð | h | r | f | v | tʃ | dʒ | m | n | ŋ | l | y | w |
| p | **50** | 13 | 3 | 1 | | | | | | 1 | 3 | | 3 | | 6 | 1 | | | 11 | | 1 | 3 | 1 | 3 |
| b | 1 | **74** | | | | 1 | | | | 1 | 1 | 1 | | | 1 | 8 | | | 1 | 3 | 1 | | | 4 |
| t | 8 | | **74** | 1 | 1 | | | | | 1 | 3 | 4 | 1 | | 1 | | 4 | | | | | | | |
| d | | | 7 | **63** | | | | 6 | | 1 | 1 | 13 | | 1 | | 1 | 1 | | | 1 | | 3 | 1 | |
| k | | | 1 | 1 | **81** | 13 | | | | | | | 1 | | | 1 | | | | 1 | | | | |
| g | | | 3 | 8 | 3 | **67** | | | | 1 | 1 | 1 | | | 1 | 3 | | 1 | | 1 | 6 | 1 | 1 | |
| s | | | 15 | | 1 | | **49** | 8 | 3 | 3 | 14 | 6 | | | | | 1 | | | | | | | |
| z | | | | | | | 6 | **56** | 1 | 10 | 14 | 10 | | | | | | 3 | | | | 1 | | |
| ʃ | | | 1 | | | | 6 | 1 | **54** | 17 | 7 | | | 3 | | | 7 | 3 | | | | | | 1 |
| ʒ | | | | | | 1 | | 4 | 11 | **43** | 6 | 7 | | 18 | | | | 6 | | | 1 | 1 | 1 | |
| θ | 1 | 29 | | 3 | | | 7 | | | | **10** | 3 | 1 | 3 | 35 | 7 | | | | | 1 | | | |
| ð | | 4 | 28 | 14 | | | | 8 | | 1 | 6 | **11** | 3 | | | 8 | | 1 | | 1 | | 7 | 1 | 6 |
| h | 4 | 1 | | 1 | | | | | 1 | | 1 | 4 | **79** | 1 | 1 | | 1 | | | | 1 | | | 1 |
| r | | 1 | 1 | | | | | | | 6 | 1 | 3 | 1 | **75** | | | | 4 | | 1 | | 1 | 4 | |
| f | 2 | 12 | | 1 | | 1 | | | 1 | 1 | 3 | 1 | | 1 | **74** | 2 | | | | | | | | |
| v | 3 | 10 | | 1 | | | | | | | 3 | | 4 | 1 | 1 | **42** | | | 1 | | | | | 33 |
| tʃ | | | 1 | | | | | 1 | 1 | 3 | 4 | 3 | | | | | **78** | 6 | 1 | | 1 | | | |
| dʒ | | | | 3 | | 4 | | 4 | | 25 | 4 | 3 | | 3 | | | 4 | **49** | | | 1 | | | |
| m | | 1 | | | | | | | | 3 | 1 | | | 1 | | 3 | | 3 | **82** | 1 | 3 | | | 1 |
| n | | | | 4 | | | | | 1 | 3 | 3 | 3 | 1 | 11 | | | 1 | | 3 | **56** | 3 | 11 | | |
| ŋ | | 3 | | 4 | 1 | 24 | | | | | 3 | | | 1 | | 3 | | | | 13 | **24** | 22 | 1 | 1 |
| l | | | | | | | | 1 | | 1 | | | | | | | | | 1 | 3 | | **86** | 3 | 4 |
| y | 1 | | | | | | | | | 7 | 1 | | | 10 | 1 | 4 | | 10 | 1 | | | 3 | **60** | 1 |
| w | | | | | | | | | | 1 | | | 1 | 4 | | 36 | | | 1 | 1 | | | 6 | **49** |

Table A7. 2.4. Simplex consonants (%): Dutch listeners – Chinese speakers

| Stimulus Consonants | Response Consonants | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | p | b | t | d | k | g | s | z | ʃ | ʒ | θ | ð | h | r | f | v | tʃ | dʒ | m | n | ŋ | l | y | w |
| p | **97** | | | | | | | | | 1 | 1 | | | | | | | | | | | | | |
| b | | **100** | | | | | | | | | | | | | | | | | | | | | | |
| t | 14 | | **51** | | | | | | | | 30 | 3 | | 1 | 1 | | | | | | | | | |
| d | 1 | 1 | 10 | **61** | 1 | | | | | | 7 | 17 | | | | | | | | 1 | | | | |
| k | 1 | | | 8 | **80** | 6 | | | 1 | | | | | 1 | | | 1 | | | | | | | |
| g | 14 | 7 | 11 | | 7 | **46** | | | | | 7 | 3 | | | 1 | | | 1 | | | 1 | | 1 | |
| s | | | | | | | **83** | 5 | 5 | 4 | 2 | | | | | | 1 | | 1 | | | | | |
| z | | | | | | | 4 | **72** | | 13 | 6 | 4 | | | | | | 1 | | | | | | |
| ʃ | | | | | | | 4 | 1 | **83** | 6 | | | | | | | 4 | 1 | | | | | | |
| ʒ | | | | 10 | | 7 | 1 | 11 | 3 | **13** | | 13 | | 1 | | | 3 | 38 | | | | | | |
| θ | | | 1 | | | | 35 | | 3 | 8 | **42** | 1 | | | 7 | | 3 | | | | | | | |
| ð | | | | 32 | | | | | | 1 | 13 | **35** | | | | 11 | 1 | | | | | | | 6 |
| h | | | | | 3 | | | 1 | | | 1 | 1 | **90** | | | | | | 1 | | | | | 1 |
| r | | | | 1 | | | | 21 | | 13 | | 4 | | **47** | | 1 | | 7 | | | | | | 6 |
| f | | | | | | | | | | | 7 | | | | **87** | 4 | | | | | | 1 | | |
| v | | | | | | | | 3 | | | 1 | | | | 3 | **21** | | | | | | | | 71 |
| tʃ | | | 1 | | | 1 | | 1 | 4 | 4 | 13 | 1 | | | | 3 | **68** | 1 | | 1 | | | | |
| dʒ | | | | | | 1 | 3 | 27 | 1 | 16 | 1 | 10 | | | | | 4 | **33** | | | | | 3 | |
| m | | | | | | | | | | | | | | | | | | | **100** | | | | | |
| n | | 1 | | | | | | | | | 1 | | | | | | | | | **96** | | 1 | | |
| ŋ | | | | | | 40 | | | | | 1 | | | | | | 3 | | 3 | 13 | **38** | | 1 | 1 |
| l | | | | | | | | | | | | 1 | 1 | | | | | | | | | **96** | | 1 |
| y | | | | | | | | | 1 | | | 1 | 1 | | 1 | | | 29 | | 1 | | 6 | **58** | |
| w | | | | | | | | 1 | | | | | 1 | 1 | | 4 | | | | | | | | **92** |

Table A7.2.5. Simplex consonants (%): Dutch listeners – Dutch speakers

| Stimulus Consonants | Response Consonants | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | p | b | t | d | k | g | s | z | ʃ | ʒ | θ | ð | h | r | f | v | tʃ | dʒ | m | n | ŋ | l | y | w |
| p | **91** | 3 | | | 6 | | | | | | | | | | | | | | | | | | | |
| b | 3 | **93** | | | | | | | | | | 1 | 1 | | | 1 | | | | | | | | |
| t | | | **72** | | | | | | | | 22 | 4 | | | | | 1 | | | | | | | |
| d | | | | **79** | 1 | | | | | | 4 | 14 | | | | | | | 1 | | | | | |
| k | | | | 3 | **97** | | | | | | | | | | | | | | | | | | | |
| g | | | | | 16 | **74** | 1 | | 1 | | 1 | | | | | | 1 | 1 | | | 3 | | | |
| s | | | | | | 1 | **78** | 8 | 8 | 3 | 1 | | | | | | | | | | | | | |
| z | | | | | | | 10 | **71** | 4 | 13 | | | | | | | | 1 | | | | | | 1 |
| ʃ | | | | | | | 3 | | **85** | 8 | | | | | | | 4 | | | | | | | |
| ʒ | | | | | | 4 | | 3 | 34 | **31** | | | | 1 | | | 3 | 20 | | | | | 4 | |
| θ | | | | | | | 6 | 18 | 1 | 6 | **40** | 7 | | 1 | 14 | 7 | | | | | | | | |
| ð | | | 4 | 24 | | 1 | | 4 | | | 43 | **19** | | 1 | 1 | | 1 | | | | | | | |
| h | | | 1 | | | | | | | 1 | | 1 | **94** | | | | | | | | | | | 1 |
| r | | | | | 1 | 1 | | | | | | | | **85** | 1 | 3 | | | | | | | | 8 |
| f | | | 1 | | 1 | | | | | | 14 | 1 | | | **74** | 8 | | | | | | | | |
| v | | | 1 | | | | | | | | 3 | | | 1 | 43 | **49** | | | | | | | | 3 |
| tʃ | | | | | | 1 | | | 1 | 3 | 19 | 4 | | | | | **61** | 10 | | | | | | |
| dʒ | | | | 3 | | 4 | | 3 | 1 | 7 | 1 | 16 | | | | | 9 | **53** | | | | | 3 | |
| m | | | | | | 1 | | | | | | | | 1 | | | | 1 | **96** | 1 | 1 | | | |
| n | | 1 | | | | | | | | | 1 | | | | | 1 | | | | **93** | | 3 | | |
| ŋ | | | | | | 3 | | | | | | 1 | 1 | | | | | | 1 | | **93** | | | |
| l | | | | | | | | | | | | 1 | | | | | | | 1 | | | **97** | | |
| y | | | | | | 1 | | | 1 | 1 | | | | | 1 | | | 29 | | | | | **65** | |
| w | | 1 | | | | | | | | | | | | 1 | | 15 | 1 | | | | | 1 | 1 | **77** |

Table A7.2.6. Simplex consonants (%): Dutch listeners – American speakers.

| Stimulus Consonants | Response Consonants | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | p | b | t | d | k | g | s | z | ʃ | ʒ | θ | ð | h | r | f | v | tʃ | dʒ | m | n | ŋ | l | y | w |
| p | **94** | | | 1 | | | | | | | 3 | 1 | | | | | | | | | | | | |
| b | | **96** | | 3 | | | | | 1 | | | | | | | | | | | | | | | |
| t | | | **71** | | | | | | | 1 | 22 | 3 | | | | | 3 | | | | | | | |
| d | | | 1 | **85** | | | | | | | 3 | 11 | | | | | | | | | | | | |
| k | | | | | **93** | 1 | | | | | | 1 | | | 1 | | 3 | | | | | | | |
| g | | | | 1 | 6 | **89** | | | | | | | | | | | | | | | 4 | | | |
| s | | | | | | 3 | **83** | 4 | 4 | 1 | 3 | | 1 | | | | | | | | | | | |
| z | | | | | | | 10 | **81** | 3 | 6 | | | | | | | | 1 | | | | | | |
| ʃ | | | | | | 1 | 1 | | **76** | 8 | | | | | | | 10 | 3 | | | | | | |
| ʒ | | | | | | 4 | | 6 | 17 | **56** | | | | | | | | 17 | | | | | | |
| θ | 3 | | 1 | | | | | | | 1 | **83** | 4 | | | 4 | | | | | | | | | 3 |
| ð | | | 3 | 21 | | | 3 | 3 | | 1 | 21 | **38** | | | | 10 | | | | | | | | 1 |
| h | | | | | | | | | | 3 | 1 | 3 | **83** | 1 | 1 | 1 | | 3 | | | 1 | 1 | | |
| r | | | | | | 1 | | | | | 1 | | | **94** | | | | | | | | 1 | | 1 |
| f | 1 | | 1 | | | | | | | | 7 | | | 1 | **82** | 7 | | | | 1 | | | | |
| v | | 3 | | 1 | | | | | 1 | | 1 | 6 | 3 | | 1 | 6 | **62** | | | | | | | 15 |
| tʃ | | | 1 | | | 1 | | | 1 | 6 | 11 | 6 | | | | | **72** | 1 | | | | | | |
| dʒ | | | | | | 6 | | 3 | 3 | 10 | | 13 | | | | | 6 | **52** | 1 | | | | 6 | 1 |
| m | | | | 1 | | | | | | | | | | | | | | | **93** | 4 | | | 1 | |
| n | | | 1 | | | | | | | | | | | | 1 | | | | | **96** | | 1 | | |
| ŋ | 1 | | | | | 4 | | | | 1 | | | | | 1 | | 1 | | | | **92** | | | |
| l | | | | | | | | | | | | | | | | | | 1 | | | | **97** | | |
| y | | 1 | | | | | | | | | | | 1 | | | 1 | | 15 | | | | | **80** | |
| w | | | | | | | | | | | 1 | | | | | | | | | | | | 3 | **96** |

Table A7.2.7. Simplex consonants (%): American listeners – Chinese speakers.

| Stimulus Consonants | Response Consonants | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | p | b | t | d | k | g | s | z | ʃ | ʒ | θ | ð | h | r | f | v | tʃ | dʒ | m | n | ŋ | l | y | w |
| p | **99** | | | | | | | | | | | | | | 1 | | | | | | | | | |
| b | | **99** | | | | | | | | 1 | | | | | | | | | | | | | | |
| t | 3 | | **83** | | | | | | 1 | | 10 | 3 | | | | | | | | | | | | |
| d | | 4 | 6 | **79** | 1 | | | | 1 | | | 8 | | | | | | | | | | | | |
| k | 1 | | | 1 | **86** | | | | | | | | | 3 | | | 9 | | | | | | | |
| g | 11 | 8 | 4 | 6 | 3 | **61** | | | | | 4 | 1 | | | | | | | | | | | 1 | |
| s | | | 1 | | | 1 | **83** | 10 | 1 | 1 | 2 | | | 1 | | | | | | | | | | |
| z | | | | | | 1 | 3 | **77** | | 13 | 1 | 3 | | | | 1 | | | | | | | | |
| ʃ | | | | | | | 3 | | **93** | 3 | | | | | | | 1 | | | | | | | |
| ʒ | | | | 7 | | 4 | | 3 | | **3** | | | | | | | 6 | 75 | 1 | | | | 1 | |
| θ | | | 1 | | | | 40 | | 4 | 1 | **47** | 1 | | | 4 | | | | | | | | | |
| ð | | | 1 | 41 | | | | 3 | | | 17 | **33** | | | | 3 | | | | | | | 1 | |
| h | | 1 | | | 1 | 1 | | 1 | | | 3 | 1 | **89** | | | | | | | | | | 1 | |
| r | 1 | 1 | | | | | 1 | 6 | 1 | 23 | | 4 | | **44** | 1 | | | 10 | | | | | 4 | 3 |
| f | | | 4 | | | | | | | | 1 | | 3 | 1 | **86** | 3 | | 1 | | | | | | |
| v | | | | | | | 2 | | | | | 2 | | | | **83** | 2 | 3 | | | | | | 9 |
| tʃ | | | 3 | 1 | | | | | 1 | 3 | | 1 | | | | | **90** | | | | | | | |
| dʒ | | | | | | 1 | | 17 | | 14 | | | | | | | 1 | 64 | | | | | 1 | |
| m | 1 | | | | | | | | | | | | | | | | | | **97** | 1 | | | | |
| n | | | | | | | | | | | | | | 1 | | 1 | | | 1 | **96** | | | | |
| ŋ | | | | | 1 | 31 | 3 | | | | | | | 1 | 1 | 1 | | 3 | 10 | 10 | **38** | 1 | | |
| l | | | | | | | 1 | | | | | 1 | | | | | | | 1 | | | **94** | 1 | |
| y | | | | | | | | | | 1 | | | | | | | | | | | 1 | 11 | **86** | |
| w | | 1 | | | | | | | | | | | | 7 | | 28 | | | 1 | | 1 | 4 | | **56** |

Table A7.2.8. Simplex consonants (%): American listeners – Dutch speakers.

| Stimulus Consonants | Response Consonants | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | p | b | t | d | k | g | s | z | ʃ | ʒ | θ | ð | h | r | f | v | tʃ | dʒ | m | n | ŋ | l | y | w |
| p | **87** | | 1 | 1 | 6 | | | | | | 3 | | | | | | 1 | | | | | | | |
| b | | **96** | | | | | | | | | | | | | | 4 | | | | | | | | |
| t | | | **83** | 1 | | | | | | 4 | 7 | | | | | | 3 | 1 | | | | | | |
| d | | | 1 | **93** | | | | | | | | 6 | | | | | | | | | | | | |
| k | | | | | **93** | 1 | | | | | | | 1 | | | | 4 | | | | | | | |
| g | | | | | 4 | **90** | 1 | | | | | | 1 | | | | 3 | | | | | | | |
| s | | | | | | | **80** | 6 | 10 | 4 | | | | | | | | | | | | | | |
| z | | | | | | 3 | 4 | **58** | 3 | 29 | 1 | | | | | | | 1 | | | | | | |
| ʃ | | | 1 | | | | | 1 | **89** | 7 | | | | | | | 1 | | | | | | | |
| ʒ | | 1 | | | | 1 | 1 | 4 | 38 | **42** | | | | | | | 1 | 10 | | | | | | |
| θ | | | | | | | 8 | 7 | | 1 | **43** | 21 | | | 18 | 1 | | | | | | | | |
| ð | | | 6 | 27 | | 3 | | | | | 46 | **15** | | | | | | | 1 | | | | | 1 |
| h | | | | | | 1 | | | 1 | | 1 | | **93** | | | | | 1 | | | 1 | | | |
| r | | | | | | | | | | | | | | **93** | | 1 | | | 1 | | | | 1 | 3 |
| f | 1 | | 4 | | | | 4 | | | | 1 | | | | **86** | 1 | | | | | 1 | | | |
| v | | 1 | 6 | | | | | 1 | | 1 | 1 | 3 | | 1 | 53 | **31** | | | | | | | | |
| tʃ | | | | | | | | | 1 | 3 | | | | | | | **86** | 10 | | | | | | |
| dʒ | | | | | | 1 | | 1 | | 7 | | | 1 | | | | 10 | **79** | | | | | | |
| m | | | | 1 | | | | | | | | | 2 | | | 1 | | | **97** | | | | | |
| n | 1 | 1 | 1 | | | 1 | 1 | | | | | | 1 | | | | | | | **86** | 1 | 4 | | |
| ŋ | | | | | | 1 | | | | | 1 | | | | | | | | | | **96** | | 1 | |
| l | | | | 1 | | | | 1 | | | | 1 | 1 | | | | | | | | | **94** | | |
| y | | | 1 | | | 1 | | | | | | | 1 | | | | | 1 | 1 | | 1 | | **90** | 1 |
| w | | 3 | | | | | | | | | | 1 | | 4 | | 57 | | | | | | 9 | | **26** |

Table A7.2.9. Simplex consonants (%): American listeners – American speakers.

| Stimulus Consonants | Response Consonants | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | p | b | t | d | k | g | s | z | ʃ | ʒ | θ | ð | h | r | f | v | tʃ | dʒ | m | n | ŋ | l | y | w |
| p | **94** | 4 | | | | | | | | | | | | | | 1 | | | | | | | | |
| b | | **93** | 3 | | 1 | 1 | | | | | | | | | | | | | | 1 | | | | |
| t | | | **85** | | | | 1 | | 1 | | 11 | | | | | | | | | 1 | | | | |
| d | | | 3 | **97** | | | | | | | | | | | | | | | | | | | | |
| k | | | 1 | 3 | **86** | 4 | | | | | 1 | | | | 1 | | 3 | | | | | | | |
| g | | | 1 | | 7 | **86** | | | | | | 1 | | | | | | | | | 4 | | | |
| s | | | 1 | | | 1 | **93** | 4 | | | | | | | | | | | | | | | | |
| z | | | | | | 1 | 1 | **87** | | 10 | | | | | | | | | | | | | | |
| ʃ | 1 | | | | | | | | **89** | 6 | 1 | | | | | | 1 | | | 1 | | | | |
| ʒ | | | | | | 1 | | 4 | 4 | **59** | | | | | | | 1 | 30 | | | | | | |
| θ | 4 | | | | | | 7 | 3 | | 1 | **79** | 4 | | | 1 | | | | | | | | | |
| ð | | 4 | 18 | 15 | | | | 4 | | 3 | 21 | **25** | | | | 6 | | 1 | | | | | 1 | |
| h | | | 1 | 1 | | | | | | | | 3 | **89** | 3 | | | | | | | | 1 | 1 | |
| r | | | | | | | | | | | | | 4 | **90** | | | | 1 | | | | | | 4 |
| f | | | 3 | | | | 1 | | 1 | 1 | 3 | 1 | 1 | | **88** | 1 | | | 1 | | | | | |
| v | | 13 | 1 | | | 1 | | 1 | | | 3 | | | | | **76** | | | | | | | 1 | 3 |
| tʃ | | | | | | | | | | | | | | | | | **94** | | | | | | | 6 |
| dʒ | | | | | | 3 | | 1 | 1 | | | | | | | | | **93** | | | | | 1 | |
| m | | | | | | | | | | | | | | | | 3 | | | **96** | | | 1 | | |
| n | | | | | | | | | | | | | | 1 | | | | | | **99** | | | | |
| ŋ | | | | | | | | | | | | | | | | | | | | | **99** | 1 | | |
| l | | | | | 1 | | | | | | | | | | | | | | | | | **99** | | |
| y | 1 | | | | | | | | | 1 | | | | | 1 | | | 1 | | | | | **93** | 1 |
| w | | | | | | | | | | | 1 | | | | | | | | | 1 | | | 1 | **96** |

| legend |
|---|
| 0% |
| 1- 10% |
| 11- 20% |
| 21- 30% |
| 31- 40% |
| 41- 50% |
| 51- 60% |
| 61- 70% |
| 71- 80% |
| 81- 90% |
| 91-100% |

**Appendix A7.3. Dendrograms for consonant confusions for each of nine combinations of speaker and listener nationality.**

Figure A7.3.1. Chinese listeners – Chinese speakers

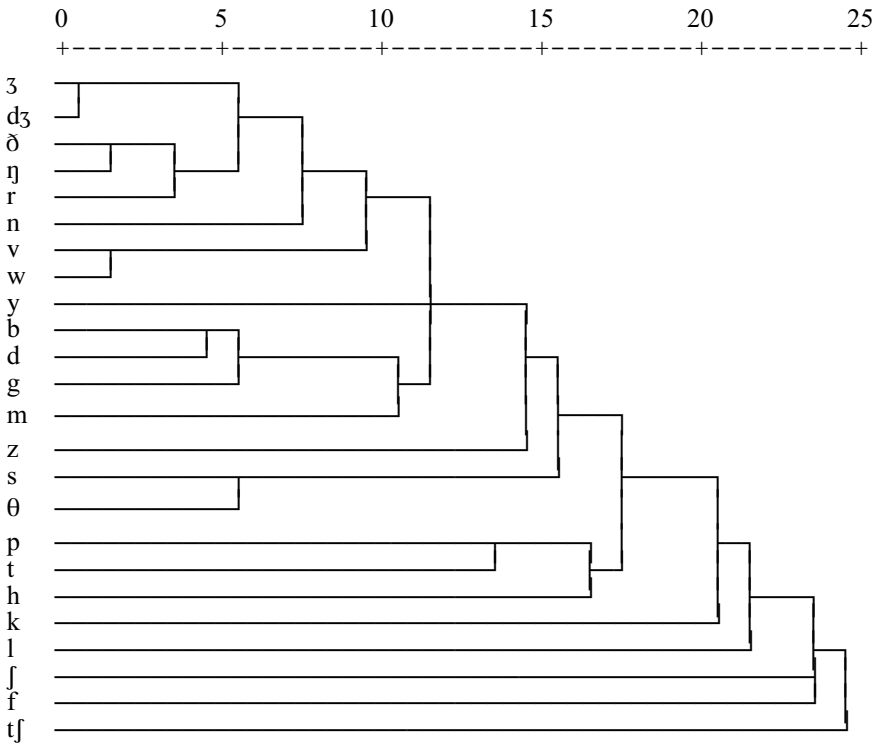


Figure A7.3.2. Chinese listeners – Dutch speakers

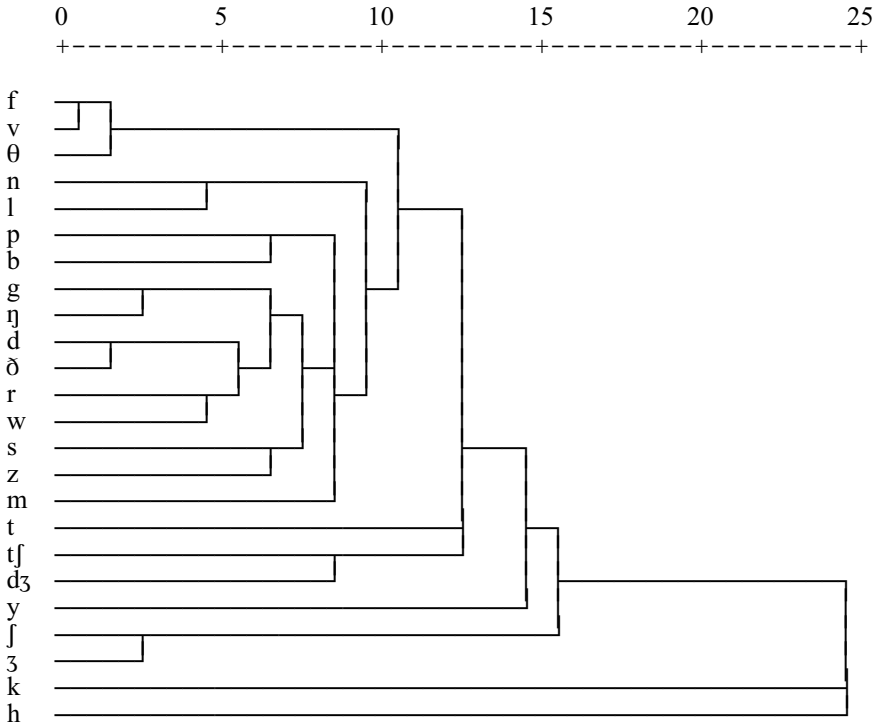


Figure A7.3.3. Chinese listeners – American speakers

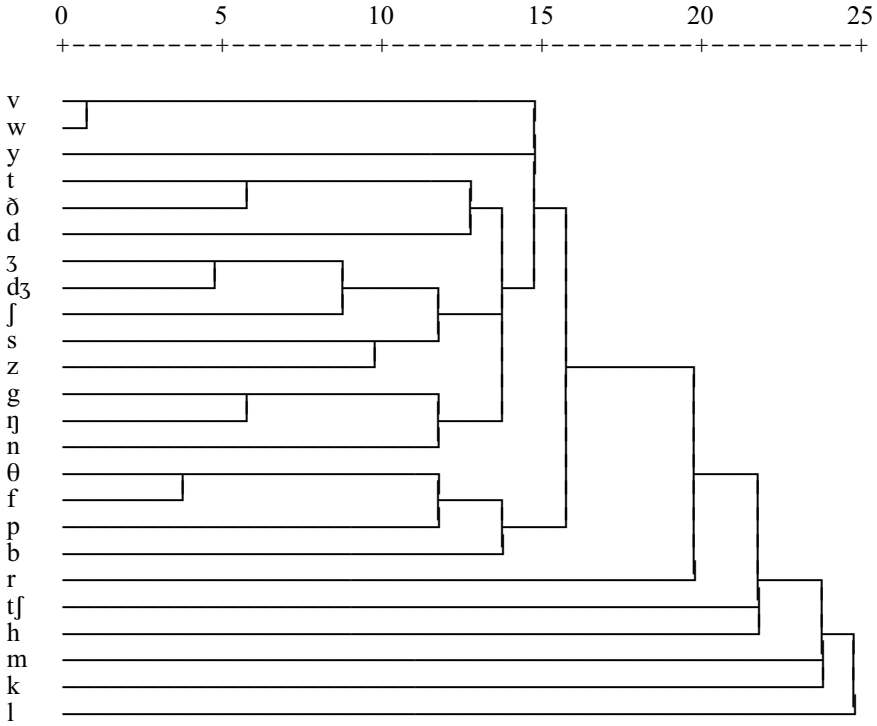


Figure A7.3.4. Dutch listeners – Chinese speakers

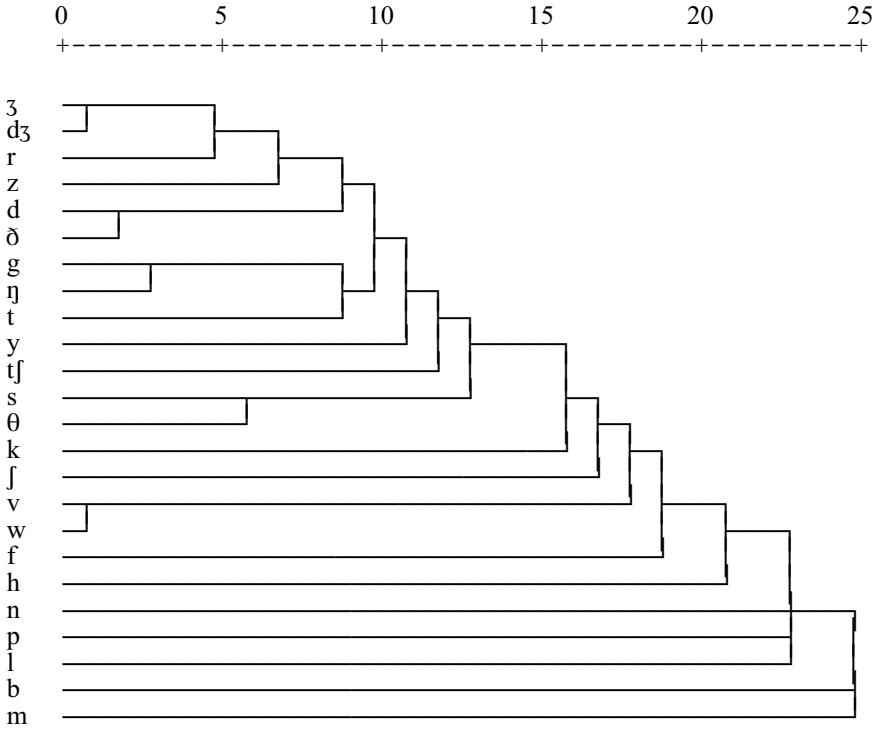


Figure A7.3.5. Dutch listeners – Dutch speakers

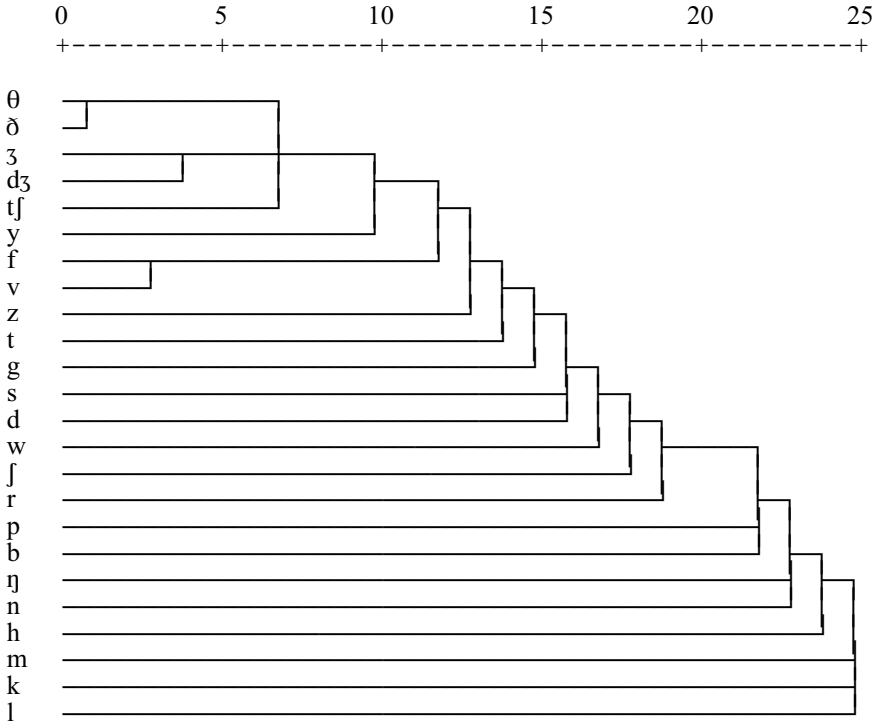


Figure A7.3.6. Dutch listeners – American speakers

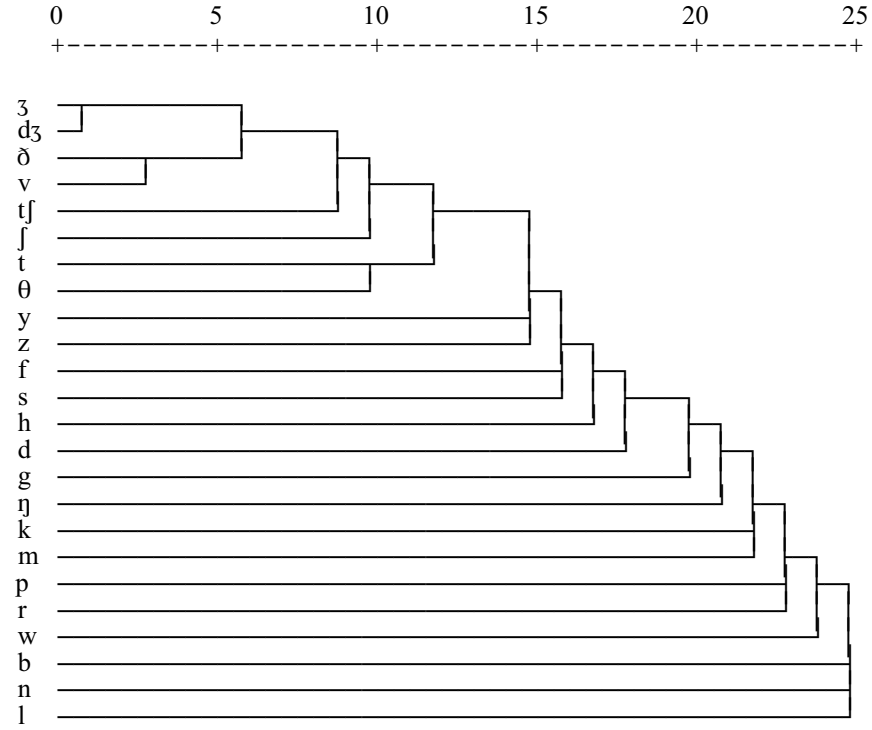


Figure A7.3.7. American listeners – Chinese speakers

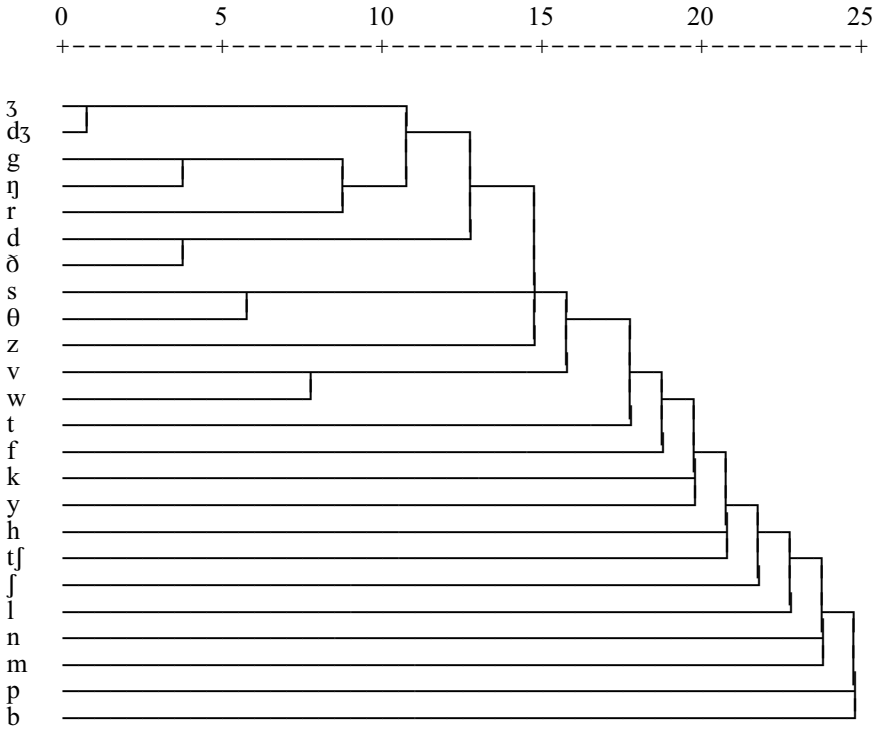


Figure A7.3.8. American listeners – Dutch speakers

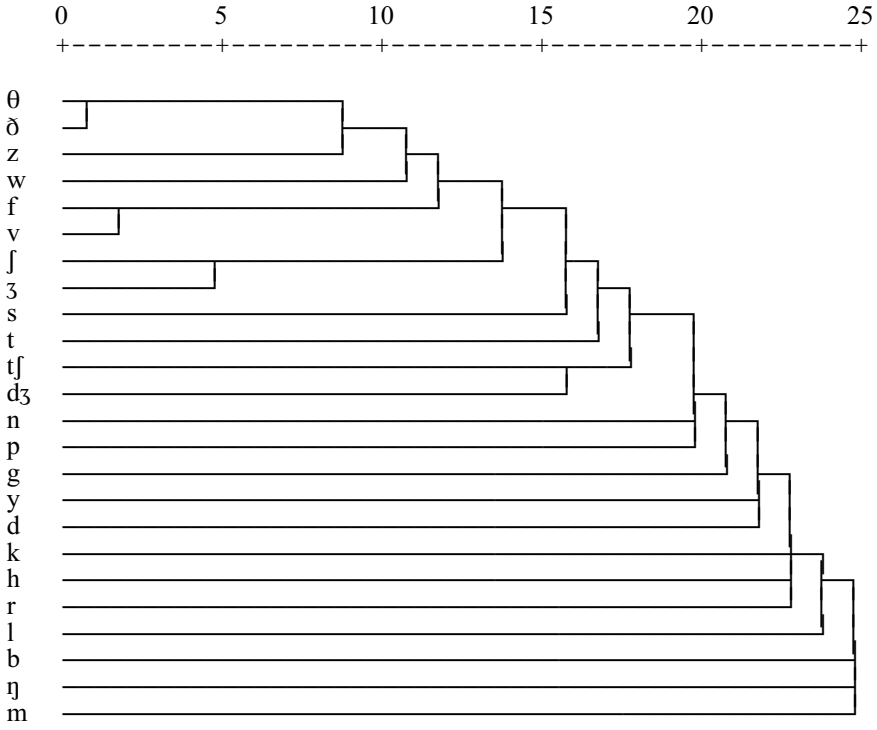
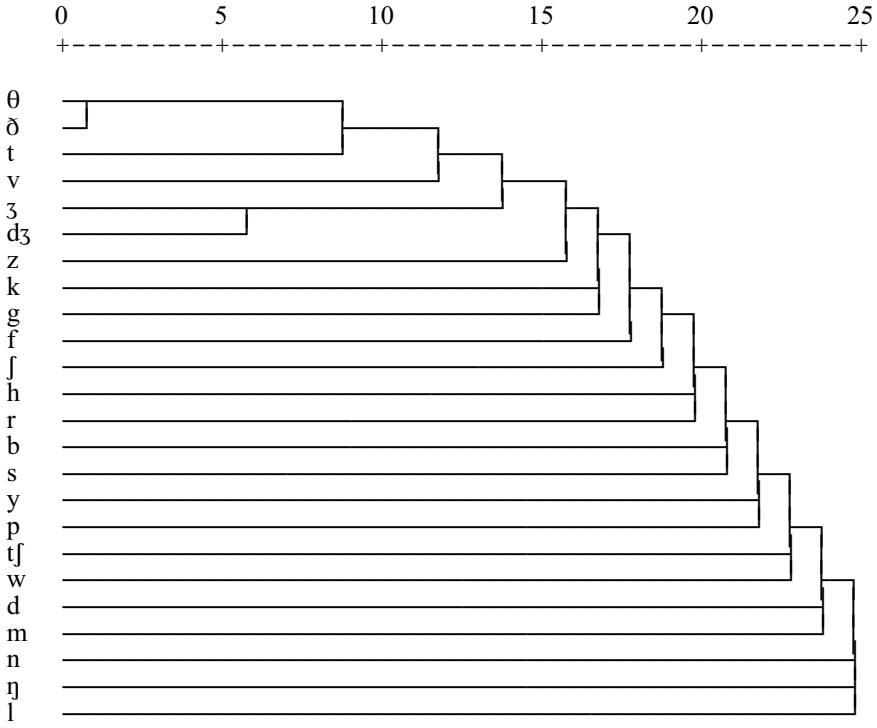


Figure A7.3.9. American listeners – American speakers



**Appendix A8.1. Percent correct consonant clusters identification broken down by language background of listener and of speaker. Mean, number of listeners, standard deviation and standard error of the mean are indicated.**

| Nationality of | | Mean | N | SD | Se |
|---|---|---|---|---|---|
| Listener | Speaker | | | | |
| Chinese | Chinese | 52.8 | 36 | 13.7 | 2.3 |
| | Dutch | 36.9 | 36 | 13.3 | 2.2 |
| | USA | 56.0 | 36 | 15.5 | 2.6 |
| | Total | 48.5 | 108 | 16.4 | 1.6 |
| Dutch | Chinese | 78.8 | 36 | 10.8 | 1.8 |
| | Dutch | 87.8 | 36 | 11.7 | 1.9 |
| | USA | 89.1 | 36 | 9.0 | 1.5 |
| | Total | 85.2 | 108 | 11.4 | 1.1 |
| USA | Chinese | 82.5 | 36 | 9.1 | 1.5 |
| | Dutch | 85.7 | 36 | 9.7 | 1.6 |
| | USA | 89.3 | 36 | 8.7 | 1.4 |
| | Total | 85.8 | 108 | 9.5 | 0.9 |
| Total | Chinese | 71.3 | 108 | 17.4 | 1.7 |
| | Dutch | 70.1 | 108 | 26.3 | 2.5 |
| | USA | 78.2 | 108 | 19.4 | 1.9 |
| | Total | 73.2 | 324 | 21.6 | 1.2 |

**Appendix A8.2 Confusion matrices for consonant clusters for each of nine combinations of speaker and listener nationality.**

Table A8.2.1. Consonant clusters (%): Chinese listeners – Chinese speakers.

| | | Response clusters | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Stimulus clusters | | pl | bl | pr | br | tr | dr | kr | gr | kl | gl | spr | spl | skr | sp | st | sk | sm | sn | sl | sw | θr |
| | pl | **74** | 7 | 7 | 3 | | | | | 3 | | | 4 | 1 | | | | | | 1 | | |
| | bl | 8 | **68** | | 10 | | 1 | | 6 | 1 | 4 | | 1 | | | | | | | | | |
| | pr | 18 | | **58** | 6 | | | 4 | 1 | 1 | | 4 | 4 | 1 | 1 | | | | | | | |
| | br | 1 | 11 | 6 | **53** | | 1 | | 11 | | 8 | 1 | 4 | | 1 | 1 | | | | | | |
| | tr | | 1 | | 1 | **68** | 8 | 3 | | 1 | 3 | 3 | | 1 | | | | | | 1 | | 8 |
| | dr | 1 | 3 | 3 | | 1 | **52** | 4 | 6 | 1 | 11 | 1 | 3 | | | 4 | 1 | | | | 4 | 3 |
| | kr | 11 | | 10 | 4 | | | **53** | 1 | 3 | | 3 | 4 | 4 | 4 | | 1 | | | 1 | | |
| | gr | | | | 1 | | | 1 | **57** | | 8 | 3 | 11 | 10 | | 1 | 4 | | 3 | | | |
| | kl | 10 | | 3 | | | | 14 | 8 | **49** | 7 | | 3 | 1 | 1 | | | 1 | 1 | | | 1 |
| | gl | | 6 | 1 | | | | | 14 | 3 | **54** | | 3 | 1 | 3 | 1 | 1 | | | 8 | 1 | 3 |
| | spr | | 4 | | 4 | | 1 | 3 | 4 | | 1 | 40 | 14 | 13 | 7 | 1 | 1 | | | | 3 | 3 |
| | spl | 4 | 1 | 3 | 1 | 1 | 1 | | 1 | | 1 | 32 | **31** | 6 | 6 | 1 | 4 | 3 | | | 3 | |
| | skr | | | | | | | 10 | 1 | | 3 | 6 | 4 | **67** | 6 | | 1 | 1 | | 1 | | |
| | sp | 3 | 3 | 8 | 6 | | | | | | 1 | 10 | 8 | 1 | **56** | | | 3 | | | | 1 |
| | st | 1 | | | | 1 | 4 | | | | 1 | 3 | 3 | 3 | 31 | **38** | 10 | 3 | 1 | | | 1 |
| | sk | | | | 1 | | 1 | 3 | 1 | 1 | 3 | 4 | 3 | 14 | 4 | 11 | **51** | | | 1 | | |
| | sm | | | | 1 | | | | | 1 | | | 1 | 1 | 8 | | | **81** | 3 | 1 | | 1 |
| | sn | | | | | | 1 | 3 | | | 1 | | | 11 | 1 | 4 | 18 | 3 | **50** | 4 | | 3 |
| | sl | 1 | 1 | | | | | | | 1 | 6 | 1 | **21** | 8 | | 1 | 6 | | 1 | **47** | | 4 |
| | sw | | | | | | | | | 1 | 3 | 10 | 4 | 1 | 7 | 3 | | 8 | 3 | 6 | **49** | 6 |
| | θr | 4 | 1 | 3 | 3 | | 3 | 1 | 4 | 4 | 4 | 10 | 11 | 15 | 4 | 4 | 3 | | 3 | 3 | 3 | **17** |

Table A8.2.2. Consonant clusters (%): Chinese listeners – Dutch speakers.

| | | Response clusters | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Stimulus clusters | | pl | bl | pr | br | tr | dr | kr | gr | kl | gl | spr | spl | skr | sp | st | sk | sm | sn | sl | sw | θr |
| | pl | **31** | 21 | 7 | | | 4 | 1 | 1 | 1 | 1 | 6 | 7 | 4 | 1 | 1 | | | 1 | 3 | 3 | 6 |
| | bl | 11 | **17** | 6 | 4 | | 3 | 1 | 1 | | 6 | | 3 | 1 | | 3 | | 7 | 29 | 3 | 1 | 4 |
| | pr | 4 | 3 | **35** | 4 | 7 | 1 | 17 | 6 | 3 | 1 | 4 | | 1 | 1 | 3 | | | 4 | | | 6 |
| | br | 3 | 6 | 8 | **35** | | 1 | 4 | 28 | | 7 | | 1 | 3 | | | | | 1 | | | 3 |
| | tr | | | 1 | | **68** | 3 | 4 | 3 | 1 | | 1 | | 3 | | 1 | | | | | | 14 |
| | dr | | 4 | 1 | 1 | 4 | **36** | | 22 | 4 | 6 | 3 | | 3 | | 4 | 1 | | | 3 | 1 | 6 |
| | kr | | | 10 | 1 | 4 | 4 | **54** | | 8 | 3 | | | 8 | 1 | | 1 | | 1 | | | 3 |
| | gr | 3 | | 7 | 7 | | 1 | 8 | **46** | 4 | 7 | 1 | 4 | 1 | 1 | 1 | 3 | | | | | 4 |
| | kl | 17 | 1 | 3 | | 6 | 6 | 10 | | **35** | 4 | 4 | 4 | 3 | | | | | | | 3 | 4 |
| | gl | 6 | 4 | 4 | 1 | 3 | 11 | | 10 | 14 | **39** | | | 1 | | | 1 | | | | 1 | 4 |
| | spr | 1 | 4 | | 3 | 1 | 3 | 3 | 1 | 1 | 1 | **35** | 3 | 26 | 3 | 1 | 3 | 1 | | 1 | 3 | 4 |
| | spl | 1 | | 1 | | 1 | | 4 | 3 | 11 | 1 | 4 | **39** | 17 | | 3 | 6 | | | 3 | | 6 |
| | skr | | | 1 | | 3 | | 7 | 6 | 34 | 1 | 6 | 7 | **15** | 6 | 1 | 4 | | | | 1 | 4 |
| | sp | 4 | 3 | | 1 | 3 | 4 | | 1 | | | 10 | 6 | 3 | **35** | 3 | 8 | 6 | | 7 | 1 | 6 |
| | st | 1 | | 3 | 1 | 6 | 1 | 1 | | 3 | 1 | 14 | 1 | 6 | 14 | **20** | 4 | 1 | | 1 | | 20 |
| | sk | | | | | 4 | 1 | 4 | 1 | 4 | 3 | 3 | 4 | 18 | | 6 | **40** | | | 3 | 1 | 7 |
| | sm | | | | 1 | 3 | 1 | 3 | 1 | 1 | | | 1 | | 1 | 3 | | **58** | 13 | 10 | 1 | 1 |
| | sn | | | 1 | 1 | | | | | 1 | | 3 | 3 | 1 | 4 | | | 8 | **53** | 14 | | 10 |
| | sl | | | 1 | 3 | 1 | 3 | 1 | 3 | 3 | | 3 | 14 | 7 | 3 | 1 | 1 | 4 | 4 | **39** | | 8 |
| | sw | 4 | | | | 3 | 3 | | | 1 | | 17 | 4 | 15 | 7 | 3 | 1 | | 1 | 6 | **15** | 19 |
| | θr | 4 | | 4 | | 11 | 6 | 1 | | 3 | | 6 | 4 | 11 | 8 | 6 | 3 | | 1 | 4 | 4 | **24** |

Table A8.2.3. Consonant clusters (%): Chinese listeners – American speakers.

| | | Response clusters | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | pl | bl | pr | br | tr | dr | kr | gr | kl | gl | spr | spl | skr | sp | st | sk | sm | sn | sl | sw | θr |
| Stimulus clusters | pl | **54** | 1 | 4 | | | 3 | 1 | | 7 | 4 | | 8 | 1 | 4 | | 3 | 1 | 1 | 3 | | 3 |
| | bl | 7 | **61** | 1 | 4 | | 1 | | 6 | 3 | 14 | | 1 | | | | | | | 1 | | |
| | pr | 11 | 3 | **65** | 6 | | | 4 | 1 | | 1 | 1 | 4 | | | | | | | 1 | | 1 |
| | br | | 10 | 8 | **63** | 1 | | 1 | 8 | 1 | 4 | | | | | 1 | | | | | | 1 |
| | tr | | | | 1 | **63** | 8 | | 1 | 1 | | | | 1 | 3 | | 1 | | | 3 | | 17 |
| | dr | | 1 | 1 | 1 | 15 | **58** | 3 | 3 | | 3 | | | 1 | | | | 1 | | | 1 | 10 |
| | kr | 3 | | 4 | | | | **74** | 1 | 8 | | | | 7 | | 3 | | | | | | |
| | gr | | | | 1 | | | 1 | **72** | 3 | 10 | 1 | 1 | 4 | 4 | | 1 | | | | | |
| | kl | | | | 1 | 4 | 29 | 1 | 3 | **40** | 3 | | 3 | 7 | | 1 | 3 | | | 1 | 1 | 1 |
| | gl | 4 | 18 | | 3 | | 4 | 3 | 13 | 4 | **38** | 1 | 3 | | 1 | | | | 1 | 4 | 1 | 1 |
| | spr | | 1 | | 11 | | 1 | | 1 | | 1 | **57** | 10 | 4 | 6 | 3 | 1 | | | | | 3 |
| | spl | 1 | | 1 | | | | | | 3 | | 4 | **76** | 7 | 3 | | | | | 4 | | |
| | skr | | | 1 | | | | 6 | 4 | 1 | | 1 | 7 | **50** | 3 | 4 | 17 | 3 | 1 | 1 | | |
| | sp | | 1 | 7 | 1 | | | | | 1 | | 8 | 8 | 3 | **61** | 4 | | 3 | | | 1 | |
| | st | | | 1 | | | 3 | 4 | 1 | 1 | 3 | 8 | 4 | 3 | 10 | **29** | 6 | 3 | 1 | 8 | | 14 |
| | sk | 25 | 6 | 1 | | 3 | | 1 | 7 | 4 | 6 | 13 | 9 | 3 | 3 | | **16** | 1 | | | | |
| | sm | | | | | 1 | | 1 | | | | 1 | 1 | 3 | 4 | 1 | 4 | **74** | 1 | 3 | 1 | 3 |
| | sn | | | | 1 | 1 | | | 3 | | | 1 | 3 | | 1 | 4 | | 4 | **75** | 1 | | 4 |
| | sl | | 1 | 1 | 3 | | | 1 | | | 4 | 3 | 4 | 1 | 4 | 4 | 1 | | 4 | **56** | 3 | 8 |
| | sw | | 1 | 3 | | 4 | | 1 | | 1 | 1 | 1 | 1 | | | | 1 | 3 | | 3 | **71** | 7 |
| | θr | 11 | 3 | 3 | 4 | | 1 | 1 | 6 | 1 | 1 | 6 | 13 | 1 | 4 | 1 | 3 | 3 | | 8 | 6 | **24** |

Table A8.2.4. Consonant clusters (%): Dutch listeners – Chinese speakers.

| | | Response clusters | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | pl | bl | pr | br | tr | dr | kr | gr | kl | gl | spr | spl | skr | sp | st | sk | sm | sn | sl | sw | θr |
| Stimulus clusters | pl | **85** | 1 | 1 | | | | | | | 3 | | 7 | | 3 | | | | | | | |
| | bl | 6 | **85** | | 8 | | | | | | | | | | | 1 | | | | | | |
| | pr | 7 | | **85** | | | | | | | | 6 | 1 | | 1 | | | | | | | |
| | br | | 1 | 1 | **94** | | 1 | | | | | | | | | | | | | | | 1 |
| | tr | | | | 1 | **62** | 4 | | | | | | | 1 | | 4 | 1 | | | | 3 | 23 |
| | dr | | | 3 | 3 | | **78** | | 1 | | 1 | | | | | | | | | | | 13 |
| | kr | | | 3 | | | 1 | **92** | 3 | | 1 | | | | | | | | | | | |
| | gr | | | | | | | 7 | **87** | 1 | 3 | | | | 1 | | | | | | | |
| | kl | | | | | | | 25 | 12 | **54** | 7 | | | 1 | | 1 | | | | | | |
| | gl | | | | | | | 1 | 3 | 15 | **79** | | | | | | | | | 1 | | |
| | spr | | | 3 | 10 | | | | | 1 | | **77** | 3 | | 1 | | 1 | | | | 1 | 1 |
| | spl | | 11 | 1 | 4 | | | | | | | 33 | **40** | | 8 | | | | | 1 | | |
| | skr | | | | | | | 1 | 7 | | | 1 | | **85** | | | 1 | 1 | | 1 | 1 | |
| | sp | | 1 | 1 | | | | | | | | 9 | 9 | 1 | **74** | | | 3 | 1 | | | |
| | st | | | | | 1 | | | 1 | 1 | | | | 1 | 6 | **84** | 1 | | | | | 3 |
| | sk | | | | | | | 3 | | 4 | 1 | | | 3 | 3 | 1 | **82** | 1 | 1 | | | |
| | sm | | | | | | | | | | | | 1 | | | | | **99** | | | | |
| | sn | | | | | | | | 1 | | | | 1 | | 1 | 1 | | | **93** | 1 | | |
| | sl | | 4 | | | | | | | | | | 4 | | | 1 | | | 1 | **89** | | |
| | sw | | | | | | | 1 | | | | | | | | | | | | | **99** | |
| | θr | | | | | 6 | 9 | | | | 1 | 4 | 6 | 3 | 1 | 4 | 1 | 1 | | 3 | 4 | **56** |

Table A8.2.5. Consonant clusters (%): Dutch listeners – Dutch speakers.

| | | Response clusters | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | pl | bl | pr | br | tr | dr | kr | gr | kl | gl | spr | spl | skr | sp | st | sk | sm | sn | sl | sw | θr |
| Stimulus clusters | pl | **88** | 4 | 1 | | | | | | | | 1 | 6 | | | | | | | | | |
| | bl | | **93** | | | | 1 | | | | | | | | | | | | 4 | | 1 | |
| | pr | 4 | 1 | **90** | | | 1 | | 1 | | | | | | 1 | | | | | | | |
| | br | | 1 | | **97** | | | | 1 | | | | | | | | | | | | | |
| | tr | | | | | **81** | 4 | | | | | | | | | | | | 1 | | | 14 |
| | dr | | 1 | | | | **93** | | 1 | | | | | | | 1 | | | | | | 3 |
| | kr | | | | | | | **85** | 3 | 3 | | | | 8 | | | | | | | | 1 |
| | gr | | | | | | | 11 | **83** | 3 | | | | 3 | | | | | | | | |
| | kl | | | | | | | | | **90** | 10 | | | | | | | | | | | |
| | gl | | | | | | | | | 7 | **93** | | | | | | | | | | | |
| | spr | | | 6 | | | | | | | | **76** | 3 | 1 | 3 | 3 | | 1 | | 1 | 1 | 4 |
| | spl | 4 | | | | | | | | | | | **93** | | 1 | | | | | 1 | | |
| | skr | | | | | | | 6 | 6 | 3 | 3 | 11 | 3 | **64** | 1 | 1 | 1 | | | | | 1 |
| | sp | | | 1 | | | | | | | | 6 | 8 | | **85** | | | | | | | |
| | st | | | | | 1 | | | | 1 | | | | | | **96** | 1 | | | | | |
| | sk | | | | | | | 1 | | 4 | | | | 7 | 3 | 3 | **77** | 4 | | | | |
| | sm | | | | | | | | | | | | | | | | | **99** | 1 | | | |
| | sn | | | | | | | | | | | | | | | 3 | | | **97** | | | |
| | sl | | | | | | 1 | | | | 1 | | 1 | | | | 1 | | | **94** | | |
| | sw | | | | | | | | | | | | 1 | | | 3 | 1 | 3 | | | **92** | |
| | θr | | | | | 4 | 1 | | | 1 | | | 3 | 3 | 4 | 1 | | 1 | | 3 | 3 | **75** |

Table A8.2.6. Consonant clusters (%): Dutch listeners – American speakers.

| | | Response clusters | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | pl | bl | pr | br | tr | dr | kr | gr | kl | gl | spr | spl | skr | sp | st | sk | sm | sn | sl | sw | θr |
| Stimulus clusters | pl | **83** | 3 | | | 1 | | | | 3 | | | 4 | | | | | | | 4 | | 1 |
| | bl | | **100** | | | | | | | | | | | | | | | | | | | |
| | pr | 6 | | **85** | 3 | | | 1 | | | | 4 | | | 1 | | | | | | | |
| | br | | 3 | | **96** | | | | 1 | | | | | | | | | | | | | |
| | tr | | | | | **79** | 3 | | | 1 | | | | | | 3 | | | | | | 14 |
| | dr | | | | 1 | | **99** | | | | | | | | | | | | | | | |
| | kr | | | 1 | | | | **90** | 4 | 1 | | | | 1 | | | 1 | | | | | |
| | gr | | | | 1 | | | 3 | **92** | 1 | | | | 3 | | | | | | | | |
| | kl | | | | | | 3 | 1 | | **86** | 7 | | 1 | | | 1 | | | | | | |
| | gl | | 1 | | | | | | 3 | 13 | **81** | | | 1 | | | | | | | | 1 |
| | spr | | | 1 | | | | | | | | **92** | 4 | | 1 | | | | | 1 | | |
| | spl | 1 | | | | | | | | | | 1 | **94** | | | | | | | 3 | | |
| | skr | | | | | | | 1 | 1 | | | 4 | | **88** | | 1 | 4 | | | | | |
| | sp | | | | | | | | | | | 1 | 4 | 4 | **89** | 1 | | | | | | |
| | st | | | | | | | | | 1 | | | | | 1 | **92** | 4 | | | | | 1 |
| | sk | 3 | | | | | | | | 7 | | | 1 | 4 | 1 | | **81** | | | | 1 | |
| | sm | | | | | | | | | | | | | 1 | | | | **92** | 6 | | 1 | |
| | sn | | | | | | | | | | | | | | | | | | **100** | | | |
| | sl | | | | | | | | | | | | | | 1 | 1 | 1 | 3 | | **90** | 3 | |
| | sw | | | | 1 | | | | | | | | | | | | | | | | **99** | |
| | θr | | | | | 15 | 1 | | | 1 | | | 1 | | | | 1 | | | | 1 | **77** |

Table A8.2.7. Consonant clusters (%): American listeners – Chinese speakers.

| Stimulus clusters \ Response clusters | pl | bl | pr | br | tr | dr | kr | gr | kl | gl | spr | spl | skr | sp | st | sk | sm | sn | sl | sw | θr |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| pl | **84** | 3 | 1 | | 1 | | | | | | | 4 | 3 | 1 | | | 1 | | | | |
| bl | | **89** | 1 | 7 | | | | | 1 | | | 1 | | | | | | | | | |
| pr | | | **94** | | | | | | | | 3 | | 1 | 1 | | | | | | | |
| br | | | | **100** | | | | | | | | | | | | | | | | | |
| tr | | 5 | | 2 | **81** | 2 | | | | | | | | | 2 | | | | | 3 | 6 |
| dr | | | | 2 | 3 | **77** | | | | 5 | | | | | | 2 | | | 2 | 8 | 3 |
| kr | | | | | | | **99** | | | | | | | | | 1 | | | | | |
| gr | | | | 1 | | 3 | | **92** | | 3 | | | | | | | | 1 | | | |
| kl | | | | | | | 33 | 7 | **55** | 1 | | | | | | 1 | | | 1 | | |
| gl | | | | | | | | 7 | 6 | **81** | 1 | | 1 | 1 | 1 | 1 | | | | | |
| spr | | 1 | | 1 | | 1 | | | | | **90** | | | 4 | | | | | | 1 | |
| spl | 3 | 6 | 1 | 1 | | | | | | | 26 | **56** | | 6 | | | | | 1 | | |
| skr | | | | | | | 4 | 4 | | 1 | 3 | | **87** | | | | | | | | |
| sp | 1 | | | | | | 1 | 1 | | | 7 | 6 | | **82** | | 1 | | | | | |
| st | | | | | 3 | | | | | | | | 1 | 3 | **87** | 1 | | | | 3 | 1 |
| sk | | | | | | 1 | 1 | 3 | 1 | 4 | 1 | | 7 | | 3 | **76** | | 1 | | | |
| sm | | | | | | | | | | | | | | | | 1 | **99** | | | | |
| sn | | | | | | | | | | | | | | | | | 3 | **96** | 1 | | |
| sl | | | | | | | | | 1 | | | 1 | 1 | | | 1 | | 1 | **90** | 1 | 1 |
| sw | | | | 1 | 1 | 1 | 1 | | | | | 3 | 1 | 3 | | | | | 1 | **85** | |
| θr | | | 1 | | 3 | | | | | 1 | 1 | | 6 | | | | | 1 | | 6 | **80** |

Table A8.2.8. Consonant clusters (%): American listeners – Dutch speakers.

| Stimulus clusters \ Response clusters | pl | bl | pr | br | tr | dr | kr | gr | kl | gl | spr | spl | skr | sp | st | sk | sm | sn | sl | sw | θr |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| pl | **81** | 6 | | 3 | | | | | | | 1 | 7 | 1 | | | | | | | | |
| bl | | **90** | | | | 1 | | | | | 1 | 3 | | | | | | 1 | | 3 | |
| pr | 3 | 1 | **85** | **1** | 1 | 1 | 1 | | | | 4 | 1 | | | | | | | | | |
| br | | | 1 | **99** | | | | | | | | | | | | | | | | | |
| tr | | | | | **83** | 7 | | | | | | | 1 | | | 1 | | | | | 7 |
| dr | | | 1 | 3 | 1 | **87** | | 1 | 3 | | | | 3 | | | | | | | | |
| kr | | | | | | 1 | **93** | | | | | | 4 | | | 1 | | | | | |
| gr | 1 | | | | | | 3 | **93** | | 1 | | | 1 | | | | | | | | |
| kl | 3 | | | | | | 3 | | **92** | 3 | | | | | | | | | | | |
| gl | 1 | | 1 | | | | | 4 | 6 | **87** | | | | | | | | | | | |
| spr | | | | | | | | | | | **93** | | 1 | | | 1 | | 3 | | 1 | |
| spl | | | | | | | | | | 1 | 3 | **92** | 1 | 3 | | | | | | | |
| skr | | | | | | | 11 | | 3 | | 7 | | **76** | | 1 | | | | 1 | | |
| sp | | | | | | | | 1 | | 1 | 7 | 7 | | **82** | | | | | | 1 | |
| st | | | 4 | | | | | | 1 | 1 | 1 | 1 | | 3 | **83** | 1 | | | 3 | | |
| sk | | | | | | | 4 | | | | | | 10 | 3 | 1 | **81** | | | | | |
| sm | | | | | | 1 | | | 3 | 1 | | | | 1 | | 1 | **90** | | | 1 | |
| sn | | | | | | | | | | | | 1 | | | | | 1 | **96** | 1 | | |
| sl | | 1 | | | | | | | | | | 3 | | | | | | 3 | **93** | | |
| sw | | | | | | | | | | | 1 | 3 | 9 | 4 | 1 | | | | 4 | **77** | |
| θr | | | | | 7 | | 1 | 1 | | | 3 | 1 | 6 | 3 | 1 | 1 | | | 4 | 4 | **66** |

Table A8.2.9. Consonant clusters (%): American listeners – American speakers.

| Stimulus clusters \ Response clusters | pl | bl | pr | br | tr | dr | kr | gr | kl | gl | spr | spl | skr | sp | st | sk | sm | sn | sl | sw | θr |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| pl | 83 | 1 | 1 | | | 3 | | | 3 | | | 9 | | | | | | | | | |
| bl | | 93 | 3 | 3 | | | | | | | | | | 1 | | | | | | | |
| pr | | | 94 | | | | | | | | 1 | | 1 | 3 | | | | | | | |
| br | | 3 | | 97 | | | | | | | | | | | | | | | | | |
| tr | | | | | 87 | 3 | | | | | | | | 1 | 1 | | | | | 1 | 6 |
| dr | | | | | | 90 | | | | | | | 4 | 1 | | | 1 | | | 3 | |
| kr | | | | | | | 94 | 3 | 1 | | | | 1 | | | | | | | | |
| gr | | | | | | | | 100 | | | | | | | | | | | | | |
| kl | | | | | | 1 | 3 | 3 | 90 | | | | 3 | | | | | | | | |
| gl | | | | | | 1 | | 3 | 3 | 89 | 1 | | | | | | 1 | | 1 | | |
| spr | | | | | | | 1 | | 1 | | 96 | | 1 | | | | | | | | |
| spl | 1 | | 1 | | | | | | | 1 | 3 | 90 | | | | | | | 3 | | |
| skr | | | | 1 | 1 | | 1 | | | | 1 | | 90 | | | | 1 | | 1 | | 1 |
| sp | | | | | | | | | | | 1 | 3 | | 96 | | | | | | | |
| st | | | | | | | | | | | | 1 | | 1 | 93 | 1 | | | | 3 | |
| sk | 1 | | | | | | 1 | | | | | 1 | 6 | 1 | 3 | 86 | | | | | |
| sm | | | | | | | | | | | | | | | | 1 | 94 | 4 | | | |
| sn | | | | | | | | | | 3 | | | | | 1 | | | 92 | 1 | 3 | |
| sl | | | 1 | | | | | 4 | | | 3 | | | 1 | | | | | 90 | | |
| sw | | 1 | | | | | | | | | 3 | | | | | | | | | 96 | |
| θr | | | 1 | | 17 | 3 | 1 | | 1 | | 4 | | | 1 | 1 | 1 | | | | | 67 |

| legend |
|---|
| 0% |
| 1- 10% |
| 11- 20% |
| 21- 30% |
| 31- 40% |
| 41- 50% |
| 51- 60% |
| 61- 70% |
| 71- 80% |
| 81- 90% |
| 91-100% |

**Appendix A9.1. SUS sentences. Percent correct word recognition broken down by language background of listener and of speaker. Mean, number of listeners, standard deviation and standard error of the mean are indicated. Scoring unit is the content word for Word scores. For sentence scores all the content words in a sentence have to be reported correctly for a sentence to be correct.**

| Nationality of | | Word scores | | | | Sentence scores | | | |
|---|---|---|---|---|---|---|---|---|---|
| Listener | Speaker | Mean | N | SD | Se | Mean | N | SD | Se |
| Chinese | Chinese | 39.3 | 35 | 9.5 | 1.6 | 4.9 | 35 | 7.8 | 1.3 |
| | Dutch | 39.0 | 35 | 11.0 | 1.9 | 5.7 | 35 | 7.0 | 1.2 |
| | USA | 44.2 | 35 | 11.3 | 1.9 | 4.9 | 35 | 7.0 | 1.2 |
| | Total | 40.8 | 105 | 10.8 | 1.1 | 5.1 | 105 | 7.2 | 0.7 |
| Dutch | Chinese | 57.1 | 36 | 9.0 | 1.5 | 16.7 | 36 | 12.6 | 2.1 |
| | Dutch | 86.2 | 36 | 8.8 | 1.5 | 60.3 | 36 | 18.7 | 3.1 |
| | USA | 90.5 | 36 | 6.5 | 1.1 | 71.1 | 36 | 16.9 | 2.8 |
| | Total | 77.9 | 108 | 17.0 | 1.6 | 49.4 | 108 | 28.6 | 2.8 |
| USA | Chinese | 59.5 | 36 | 8.1 | 1.3 | 18.3 | 36 | 9.4 | 1.6 |
| | Dutch | 83.0 | 36 | 6.0 | 1.0 | 51.9 | 36 | 14.9 | 2.5 |
| | USA | 95.5 | 36 | 4.1 | 0.7 | 85.0 | 36 | 13.0 | 2.2 |
| | Total | 79.3 | 108 | 16.2 | 1.6 | 51.8 | 108 | 30.1 | 2.9 |
| Total | Chinese | 52.1 | 107 | 12.6 | 1.2 | 13.4 | 107 | 11.7 | 1.1 |
| | Dutch | 69.7 | 107 | 23.2 | 2.2 | 39.6 | 107 | 27.9 | 2.7 |
| | USA | 77.0 | 107 | 24.4 | 2.4 | 54.1 | 107 | 37.3 | 3.6 |
| | Total | 66.3 | 321 | 23.2 | 1.3 | 35.7 | 321 | 32.4 | 1.8 |

**Appendix A9.2. Low-predictability (LP) and High-predictability (HP) SPIN sentences. Percent correct word recognition broken down by language background of listener and of speaker. Mean, number of listeners, standard deviation and standard error of the mean are indicated. In the left part of the table the results are given for low-predictability contexts, in the right part the scores obtained for the high-predictability targets are listed.**

| Nationality of | | LP targets | | | | HP targets | | | | All targets | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Listener | Speaker | Mn | N | SD | Se | Mn | N | SD | Se | Mn | N | SD | Se |
| Chinese | Chinese | 19.4 | 36 | 15.2 | 2.5 | 16.7 | 36 | 10.4 | 1.7 | 17.7 | 36 | 9.3 | 1.5 |
| | Dutch | 38.9 | 36 | 15.8 | 2.6 | 37.8 | 36 | 19.6 | 3.3 | 39.2 | 36 | 14.9 | 2.5 |
| | USA | 17.9 | 36 | 10.5 | 1.7 | 31.8 | 36 | 12.5 | 2.1 | 24.8 | 36 | 8.4 | 1.4 |
| | Total | 25.4 | 108 | 16.9 | 1.6 | 28.7 | 108 | 17.1 | 1.6 | 27.3 | 108 | 14.3 | 1.4 |
| Dutch | Chinese | 26.9 | 36 | 16.1 | 2.7 | 33.1 | 36 | 11.4 | 1.9 | 30.7 | 36 | 10.4 | 1.7 |
| | Dutch | 81.3 | 36 | 12.1 | 2.0 | 76.1 | 36 | 21.3 | 3.5 | 79.7 | 36 | 12.2 | 2.0 |
| | USA | 77.8 | 36 | 13.4 | 2.2 | 84.9 | 36 | 14.1 | 2.3 | 81.8 | 36 | 11.7 | 2.0 |
| | Total | 62.0 | 108 | 28.6 | 2.7 | 64.7 | 108 | 27.8 | 2.7 | 64.1 | 108 | 26.3 | 2.5 |
| USA | Chinese | 39.4 | 36 | 12.7 | 2.1 | 57.8 | 36 | 11.0 | 1.8 | 50.9 | 36 | 9.2 | 1.5 |
| | Dutch | 67.7 | 36 | 14.5 | 2.4 | 99.4 | 36 | 3.3 | 0.6 | 77.8 | 36 | 10.2 | 1.7 |
| | USA | 95.2 | 36 | 9.0 | 1.5 | 99.1 | 36 | 4.1 | 0.7 | 97.4 | 36 | 5.3 | 0.9 |
| | Total | 67.4 | 108 | 26.0 | 2.5 | 85.4 | 108 | 20.8 | 2.0 | 75.3 | 108 | 20.9 | 2.0 |
| Total | Chinese | 28.5 | 108 | 16.8 | 1.6 | 35.8 | 108 | 20.1 | 1.9 | 33.1 | 108 | 16.7 | 1.6 |
| | Dutch | 62.6 | 108 | 22.7 | 2.2 | 71.1 | 108 | 30.5 | 2.9 | 65.6 | 108 | 22.5 | 2.2 |
| | USA | 63.6 | 108 | 35.1 | 3.4 | 71.9 | 108 | 31.1 | 3.0 | 68.0 | 108 | 32.5 | 3.1 |
| | Total | 51.6 | 324 | 30.6 | 1.7 | 59.6 | 324 | 32.4 | 1.8 | 55.6 | 324 | 29.4 | 1.6 |