**Supplementary materials**

Podcast-based pronunciation training: Enhancing FL learners’ perception and production of fossilised segmental features

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**A. Testing stimuli**

Stimuli for the perception tasks used for the English /s – z/ oddity discrimination task

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Change triads /s - z/ |  | Catch triads /s - z/ |  | Distractors /s - ʃ/ |
| 1 | **s**ap | **z**ap | 11 | **s**ing | **s**ing | 21 | **s**ee | **sh**e |
| 2 | **s**eal | **z**eal | 12 | **z**ap | **z**ap | 22 | **s**ue | **sh**oe |
| 3 | **s**aid | **z** | 13 | **z**ing | **z**ing | 23 | see**s**aw | sea**sh**ore |
| 4 | **s**ing | **z**ing | 14 | **s**ap | **s**ap | 24 | Iri**s** | Iri**sh** |
| 5 | fu**ss**y | fu**zz**y | 15 | pre**c**edent | pre**c**edent | 25 | ma**ss** | ma**sh** |
| 6 | pre**s**ident | pre**c**edent | 16 | mu**sc**le | mu**sc**le |  |  |  |
| 7 | mu**sc**le | mu**zz**le | 17 | fu**zz**y | fu**zz**y |  |  |  |
| 8 | ra**c**ing | rai**s**in | 18 | rai**s**in | rai**s**in |  |  |  |
| 9 | bu**s** | bu**zz** | 19 | bu**zz** | bu**zz** |  |  |  |
| 10 | pri**ce** | pri**ze** | 20 | pri**ce** | pri**ce** |  |  |  |

Familiar and novel words in the identification task for /s – z/ including the number of occurrences of familiar words during training (NO)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|   |  Familiar  |   |  Novel  |   | Distractors |
|  | /s/ | NO |  | /z/ | NO |  | /s/ |  | /z/ |  | /ʃ/ |
| 1 | **s**o | 14 | 11 | mu**s**ic | 4 | 21 | **s**ign | 31 | **z**ero | 41 | **sh**oe |
| 2 | **s**ome | 7 | 12 | rea**s**on | 4 | 22 | **s**oup | 32 | **Z**oe | 42 | **sh**e |
| 3 | **s**ound | 5 | 13 | e**x**ample | 2 | 23 | **c**entre | 33 | **X**erox | 43 | mi**ss**ion |
| 4 | per**s**on | 3 | 14 | e**x**actly | 1 | 24 | **c**eiling | 34 | bo**s**om | 44 | i**ss**ue |
| 5 | an**s**wer | 1 | 15 | ea**s**y | 1 | 25 | **c**ircle | 35 | re**s**ume | 45 | bu**sh** |
| 6 | que**s**tion | 7 | 16 | i**s** | 25 | 26 | profe**ss**or | 36 | trea**s**on | 46 | **s**ugar |
| 7 | ju**s**t | 10 | 17 | noi**se** | 24 | 27 | De**c**ember | 37 | de**s**ire | 47 | man**s**ion |
| 8 | it’**s** | 12 | 18 | a**s** | 9 | 28 | de**c**ent | 38 | ari**se** | 48 | pa**ss**ion |
| 9 | ye**s** | 5 | 19 | ha**s** | 7 | 29 | mou**se** | 39 | era**se** |  |  |
| 10 | offi**ce** | 6 | 20 | wa**s** | 6 | 30 | clo**se** (adj.) | 40 | mu**se** |   |   |

Stimuli used in the delayed accent-mimicry task

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | /b/ | /d/ | /g/ | /p/ | /t/ | /k/ |
| 1 | de**b**ate | i**d**ioma | ha**g**o | com**p**rar | **t**ienes | **qu**é |
| 2 | glo**b**al | Cana**d**á | fi**g**ura | **P**alencia | ir**t**e | **c**omprar |
| 3 | auto**b**ús | me**d**io | Lu**g**o | **p**rimos | **t**omate | **c**uándo |
| 4 | a**b**uelo | pue**d**o | a**g**ua | **P**amplona | **t**ía | **qu**ieres |
| 5 | be**b**e | cui**d**ar | **g**usta | **p**edirme | fal**t**a | **qu**e |

Stimuli used in the perception task for English /b d g/

|  |  |  |  |
| --- | --- | --- | --- |
|  | /b/ | /d/ | /g/ |
|  | Spanish | English | Spanish | English | Spanish | English |
| Initial position | **b**anana | **b**anana | **d**anza | **d**ance | **g**ol | **g**oal |
| **b**anda | **b**and | **d**ólar | **d**ollar | **g**uía | **g**uide |
| **b**ar | **b**ar | **d**aga | **d**agger | **gu**itarra | **gu**itar |
| **b**ase | **b**ase | **d**ebate | **d**ebate | **g**as | **g**as |
| **b**ate | **b**at | **d**efensa | **d**efence | **g**orila | **g**orilla |
| Medial position | É**b**ola | E**b**ola | a**d**icto | a**dd**ict (v.) | da**g**a | da**gg**er |
| a**b**adía | a**bb**ey | cré**d**ito | cre**d**it | me**g**a | me**g**a |
| la**b**or | la**b**our | i**d**ioma | i**d**iom | ri**g**or | ri**g**our |
| o**b**eso | o**b**ese | lí**d**er | lea**d**er | le**g**al | le**g**al |
| I**b**eria | I**b**eria | me**d**io | me**d**ium | fi**g**ura | fi**g**ure |
| Control items (/b d g/ preceded by nasal) | sím**b**olo | sym**b**ol | in**d**ustria | in**d**ustrial | distin**gu**e | distin**g**uish |
| com**b**inar | com**b**ine | referén**d**um | referen**d**um | len**g**ua | lan**g**uage |
| miem**b**ro | mem**b**er | apén**d**ice | appen**d**ix | sin**g**ular | sin**g**ular |
|  | /p/ | /t/ | /k/ |
| Spanish | English | Spanish | English | Spanish | English |
| Distractors (non-target items /p t k/) | **p**in | **p**in | **t**ipo | **t**ype | **c**lan | **c**lan |
| a**p**arte | a**p**art | **t**é | **t**ea | e**c**o | e**ch**o |
| i**P**od | i**P**od | **t**omate | **t**omato |  |  |
|  | **p**an | **p**an |  |  |  |  |

Stimuli used in the imitation task for /z/ and English /b d g/

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|   | /z/ |  | /b/ |  | /d/ |  | /g/ |  | /ʃ/ |
| 1 | **z**eal | 6 | a**b**undance | 11 | come**d**y | 16 | ri**g**our | 21 | **sh**eep  |
| 2 | **z**ing | 7 | a**bb**ey | 12 | a**dd**ict | 17 | for**g**et | 22 | i**ss**ue |
| 3 | **z** | 8 | a**b**ility | 13 | A**d**am | 18 | be**g**in | 23 | fi**sh** |
| 4 | rai**s**in | 9 | Octo**b**er | 14 | i**d**iom | 19 | ne**g**otiate |  |  |
| 5 | fu**zz**y | 10 | I**b**eria | 15 | a**d**equate | 20 | fi**g**ure |  |  |

Stimuli for the sentence-reading task measuring the participants’ production of English /z/

|  |  |
| --- | --- |
| /z/ | /ʃ/ |
|  | Familiar |  | Novel |  | Distractors |
| 1 | mu**s**ic | 11 | **z**oom | 21 | **sh**oes |
| 2 | rea**s**on | 12 | **z**oo | 22 | **sh**ower |
| 3 | e**x**ample[[1]](#footnote-1) | 13 | **z**ipper | 23 | **s**ugar |
| 4 | re**s**idential | 14 | **z**one | 24 | **sh**ip |
| 5 | ea**s**y | 15 | **z**ebra | 25 | **sh**eep |
| 6 | noi**se**  | 16 | **z**ombie |  |  |
| 7 | prize**s** | 17 | cou**s**in |  |  |
| 8 | office**s** | 18 | bu**s**y |  |  |
| 9 | dollar**s** | 19 | pri**s**on |  |  |
| 10 | word**s** | 20 | mu**s**eum |  |  |

Stimuli for the sentence-reading task measuring the participants’ production of /b d g/

|  |  |  |
| --- | --- | --- |
| /b/ | /d/ | /g/ |
| familiar | novel | familiar | novel | familiar | novel |
| a**b**out | lo**bb**y | to**d**ay | a**dd**ict | to**g**ether | su**g**ar |
| a**b**ility | ra**bb**it | i**d**ea | corri**d**or | a**g**o | ti**g**er |
| a**b**use | glo**b**al | a**d**ore | melo**d**y | a**g**ain | le**g**al |
| may**b**e | a**bb**ot | confi**d**ent | mo**d**ern | ne**g**ative | yo**g**urt |
| no**b**ody | a**b**ove | stu**d**y | a**d**apt | pro**g**ramme | be**g**in |
| **b**it |  | **d**idn't |  | **gu**ide |  |
| **b**enefits |  | **d**ifficult |  | **g**overnment |  |
| **B**BC |  | **d**ay |  | **g**ood |  |
| **b**ottle |  | **d**on't |  | **gu**ess |  |
| **b**e  |  | **d**ancer |  | **g**oing |  |

Stimuli for the timed picture-description task for /z/ and /b d g/

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | /z/ |  | /b/ |  | /d/ |  | /g/ |  | /ʃ/ |
|  | familiar |  | familiar |  | familiar |  | familiar |  | distractors |
| 1 | mu**s**ic | 9 | a**b**out | 14 | i**d**ea | 19 | a**g**ain | 24 | **sh**ower |
| 2 | e**x**ample | 10 | may**b**e | 15 | stu**d**y | 20 | ne**g**ative | 25 | **sh**eep |
| 3 | rea**s**on | 11 | no**b**ody |  |  |  |  | 26 | fi**sh** |
| 4 | ea**s**y |  |  |  |  |  |  |  |  |
| 5 | noi**se** |  |  |  |  |  |  |  |  |
|  | novel |  | novel |  | novel |  | novel |  |  |
| 6 | **z**oo | 12 | ra**bb**it | 16 | a**dd**ict | 21 | su**g**ar |  |  |
| 7 | **z**ebra | 13 | glo**b**al | 17 | melo**d**y | 22 | ti**g**er |  |  |
| 8 | **z**oom |  |  | 18 | mo**d**ern | 23 | le**g**al |  |  |

**B. Training stimuli**

Number of examples and percentages of appearance of each target sound in the edited versions of the podcasts used for training (Pod.) and in total (Tot.)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|   | **Pod. 1** | **Pod. 2** | **Pod. 3** | **Tot. per sound** |
|  | **nº** | **%** | **nº** | **%** | **nº** | **%** | nº | **%** |
| **/s/** | 80 | 48.2 | 85 | 54.5 | 119 | 59.8 | 284 | 54.5 |
| **/z/** | 86 | 51.8 | 71 | 45.5 | 80 | 40.2 | 237 | 45.5 |
| **Tot.**  | 166 |   | 156 |   | 199 |   | 521 |   |
|   | **Pod. 1** |  | **Pod. 2** |  | **Pod. 3** |  | **Tot. per sound** |
|  | **nº** | **%** | **nº** | **%** | **nº** | **%** | **nº** | **%** |
| **/b/** | 52 | 37.4 | 50 | 29.6 | 68 | 34.3 | 170 | 33.6 |
| **/d/** | 66 | 47.5 | 73 | 43.2 | 104 | 52.5 | 243 | 48 |
| **/g/** | 21 | 15.1 | 46 | 27.2 | 26 | 13.1 | 93 | 18.4 |
| **Tot.** | 139 |   | 169 |   | 198 |   | 506 |   |

Stimuli learners had to read for the output stage

Group 1: /s/ - /z/

|  |
| --- |
| Text 1 |
| /s/ (n = 16) /z/ (n = 23)  |
| He *i****s*** the per**s**on who hate**s** noi**se**. For e**x**ample, he doe**s**n’t like mu**s**ic. He ju**s**t enjoy**s** pea**ce** and **s**ilen**ce**, he avoid**s** any **s**ound. He hate**s** bar**s**, club**s**, and even car**s**! It’**s** ama**z**ing…Hi**s** brother i**s** a mu**s**ician **s**o… he left hi**s** hou**se** the moment he wa**s** 18 year**s** old. That’**s** the rea**s**on why he live**s** in a re**s**idential area. It’**s** **s**o annoying for u**s**… becau**se** we never **s**ee him now. He could vi**s**it from time to time, but he never doe**s**.  |
| Text 2 |
| /s/ (n = 15) /z/ (n = 22)  |
| Do you think winning pri**z**e**s** i**s** ea**s**y? You don’t need to an**s**wer the que**s**tion. It *i****s***! There’**s** a ca**s**ino Bra**z**il where you can win pri**z**e**s** a**s** big a**s** 3 million dollar**s**! **S**ome people go there and ju**s**t **s**pend two dollar**s**. Ne**x**t thing you know… they’re millionaire**s**! **S**ome guy named Mike, I think it wa**s**…He won five million dollar**s** and he only **s**pent **s**i**x**! You have nothing to lo**se**… That’**s** e**x**actly what I need! I would never take bu**s**e**s** again… I’d buy **s**even car**s**, one for each day. It will be like having **s**even pair**s** of shoe**s**.  |

Group 2: /b, d, g/

|  |
| --- |
| Text 1 |
| /b/ (n = 9) /d/ (n = 10) /g/ (n = 8)  |
| May**b**e I **d**on’t nee**d** to **g**o to the interview. I’ve **b**een thinking a**b**out my jo**b** to**d**ay. I was very ne**g**ative when I saw you two **d**ays a**g**o. It’s not too **b**a**d**. You see… with the **g**overnment now in power it’s very **d**ifficult to see any **b**enefits. The crisis is **g**etting worse. **B**ut thank you for all the **g**oo**d** a**d**vice you **g**ave me. I’ll **d**efinitely remem**b**er it an(**d**) I’ll try to **b**e more positive. I’m so happy I want to hu**g** you! |
| Text 2 |
| /b/ (n = 9) /d/ (n = 20) /g/ (n = 11)  |
| I won**d**er why you **d**i**d**n’t like the pro**g**ramme on the **BB**C yester**d**ay. The **d**ialo**gue** was **g**reat… An(**d**) I love**d** the way they presente**d** it! Although it was a **b**it **b**oring at first… I **d**on’t re**g**ret watching it. I **gu**ess it improve**d** towar**d**s the en**d**, when **g**oing a**b**out people’s a**b**ility to stu**d**y lan**g**uages. They sai**d** they felt more confi**d**ent when they talk to**g**ether. **B**ut that it **g**ot very **d**ifficult when talking to **d**ifferent people. Also, they **d**i**d**n’t like stu**d**ying for exams. When I was a little **b**oy, I kept **b**e**gg**ing my teachers to not have e**x**ams. |

1. Even though the <x> in the word *example* can be pronounced as /ks/ or /gz/, it was considered an interesting token in order to illustrate that <x> can be a potential spelling for /z/, as evinced in the instantiations of this token in the podcasts. Since the version with the voiced segment is the one learners were exposed to during training, the participants’ pronunciation of this word was evaluated based on whether they had assimilated this information or not. [↑](#footnote-ref-1)