**Supplementary materials**

## Auditory stimuli (continued)

In sum, we see that the acoustic stimuli used for the 2AFC task of the present project presents a large amount of between-variety and within-speaker variability. Most notably, our declarative utterances are often difficult to distinguish and we do not often see the typical L+H\* L%) nuclear configuration that most commonly seen in the extant literature. We believe this is likely due to the fact that the manner in which we elicited narrow focus differs from other studies, which tend to use more specific pragmatic contexts (narrow focus correction, narrow focus contradiction), as opposed to a narrow focus utterance produced from answering an information seeking wh- question. That is, it may be the case that the use of a different pragmatic context and lab speech may result in contours different from those attested in other studies. This likely resulted in our narrow focus condition being easier than we initially intended. Our method of eliciting narrow focus follows that of Brandl et al. (2020), of which our study is a conceptual replication. We do not have access to their auditory stimuli, thus we cannot confirm which pitch contours were most common in their narrow focus condition. To illustrate the panhispanic and within-speaker variability of statements and questions, we plot the individual pitch contours from each utterance type by variety in Figure 21.

Figure 21.  Pitch contours as function of time for utterance type and variety of Spanish. Thinner, opaque lines represent individual items, and thicker, dark lines represent the average contour trajectory. F0 values were log transformed and standardized for between speaker/variety comparability.

*Figure* *21.*  Pitch contours as function of time for utterance type and variety of Spanish. Thinner, opaque lines represent individual items, and thicker, dark lines represent the average contour trajectory. F0 values were log transformed and standardized for between speaker/variety comparability.

**Randomization check across participants**. For the purposes of our research questions, it was important that every participant be presented with stimuli from all of the Spanish varieties to which we had access. Recall that the 2AFC task contained 64 items, 16 of each utterance type. Using javascript we assigned each variety an equal probability of being selected in a given trial (0.125). To ensure that our randomization worked as planned (i.e., with each variety represented approximately equally across all trials and all participants), we calculated the average number of times each variety was presented in the data set (n = 225, and 14400 trials). One can observe in Figure 22 that this is indeed the case.

Figure 22.  Average number of tokens (±1 SD) presented from each speaker variety across all 14,400 trials. The experiment was programmed such that each of the 8 varieties had an equal probability of being presented (12.50%) across 64 experimental trials.

*Figure* *22.*  Average number of tokens (±1 SD) presented from each speaker variety across all 14,400 trials. The experiment was programmed such that each of the 8 varieties had an equal probability of being presented (12.50%) across 64 experimental trials.

*Items*. Table 12 provides a list of all of the target items used for each utterance type.

Table 12: Experimental items produced in auditory stimuli.

| Utterance type | Item |
| --- | --- |
| Broad focus statement | Ana lleva el abrigo |
|  | Daniel iba a Bolivia |
|  | David leía el libro |
|  | El bebe comía muy bien |
|  | El hombre mira la luna |
|  | El niño oye el río |
|  | Emilio ama la marcha |
|  | La maestra vive en Paris |
|  | La niña lava el plato |
|  | Manuela vende el carro |
|  | María bebe el vino |
|  | Maríano habla del tiempo |
|  | Marta abre el regalo |
|  | Mi madre come la fruta |
|  | Mi novio viene del lago |
|  | Mi tía odia la lluvia |
| Narrow focus statement | (¿Qué lleva Ana?) Ana lleva el abrigo |
|  | (¿A dónde iba Daniel?) Daniel iba a Bolivia |
|  | (¿Qué leía David?) David leía el libro |
|  | (¿Cómo comía el bebé?) El bebe comía muy bien |
|  | (¿Qué mira el hombre?) El hombre mira la luna |
|  | (¿Qué oye el niño?) El niño oye el río |
|  | (¿Qué ama Emilio?) Emilio ama la marcha |
|  | (¿Dónde vive la maestra?) La maestra vive en Paris |
|  | (¿Qué lava la niña?) La niña lava el plato |
|  | (¿Qué vende Manuela?) Manuela vende el carro |
|  | (¿Qué bebe María?) María bebe el vino |
|  | (¿De qué habla Mariano?) Maríano habla del tiempo |
|  | (¿Qué abre Marta?) Marta abre el regalo |
|  | (¿Qué come tu madre?) Mi madre come la fruta |
|  | (¿De dónde viene tu novio?) Mi novio viene del lago |
|  | (¿Qué odia tu tía?) Mi tía odia la lluvia |
| Wh- question | ¿Cuándo bebía el vino? |
|  | ¿Cuándo comía la fruta? |
|  | ¿Cuándo lavaba el plato? |
|  | ¿Cuándo leía el libro? |
|  | ¿Cuándo lleva el abrigo? |
|  | ¿Cuándo miraba la luna? |
|  | ¿Cuándo vendia el carro? |
|  | ¿Por qué abre el regalo? |
|  | ¿Por qué ama la navidad? |
|  | ¿Por qué desayuna muy bien? |
|  | ¿Por qué hablaba del agua? |
|  | ¿Por qué iba a Bolivia? |
|  | ¿Por qué odiaba la lluvia? |
|  | ¿Por qué oia el río? |
|  | ¿Por qué venia del lago? |
|  | ¿Por qué vivia en Paris? |
| yes/no question | ¿Ana lleva el abrigo? |
|  | ¿Daniel iba a Bolivia? |
|  | ¿David leía el libro? |
|  | ¿El bebe comía muy bien? |
|  | ¿El hombre mira la luna? |
|  | ¿El niño oye el río? |
|  | ¿Emilio ama la marcha? |
|  | ¿La maestra vive en Paris? |
|  | ¿La niña lava el plato? |
|  | ¿Manuela vende el carro? |
|  | ¿María bebe el vino? |
|  | ¿Maríano habla del tiempo? |
|  | ¿Marta abre el regalo? |
|  | ¿Mi madre come la fruta? |
|  | ¿Mi novio viene del lago? |
|  | ¿Mi tía odia la lluvia? |

## Author contributions

Figure 23.  Author contributions according to the CREDiT author roles taxonomy. Contributions are indicated as being substantial (dark diamonds) or moderate (light diamonds).

*Figure* *23.*  Author contributions according to the CREDiT author roles taxonomy. Contributions are indicated as being substantial (dark diamonds) or moderate (light diamonds).

## Reproducibility information

**About this document**

This document was written in RMarkdown using papaja (Aust & Barth, 2018).

**Session info**

setting value  
 version R version 4.2.1 (2022-06-23)  
 os macOS Big Sur ... 10.16  
 system x86\_64, darwin17.0  
 ui X11  
 language (EN)  
 collate en\_US.UTF-8  
 ctype en\_US.UTF-8  
 tz America/New\_York  
 date 2022-11-11  
 pandoc 2.18 @ /Applications/RStudio.app/Contents/MacOS/quarto/bin/tools/ (via rmarkdown)

loadedversion date  
abind 1.4-5 2016-07-21  
arrayhelpers 1.1-0 2020-02-04  
assertthat 0.2.1 2019-03-21  
backports 1.4.1 2021-12-13  
base64enc 0.1-3 2015-07-28  
bayesplot 1.9.0 2022-03-10  
bayestestR 0.13.0 2022-09-18  
beeswarm 0.4.0 2021-06-01  
bit 4.0.4 2020-08-04  
bit64 4.0.5 2020-08-30  
bookdown 0.29 2022-09-12  
bridgesampling 1.1-2 2021-04-16  
brms 2.18.0 2022-09-19  
Brobdingnag 1.2-7 2022-02-03  
cachem 1.0.6 2021-08-19  
callr 3.7.2 2022-08-22  
cellranger 1.1.0 2016-07-27  
checkmate 2.1.0 2022-04-21  
cli 3.4.1 2022-09-23  
cmdstanr 0.5.3 2022-08-25  
coda 0.19-4 2020-09-30  
codetools 0.2-18 2020-11-04  
colorspace 2.0-3 2022-02-21  
colourpicker 1.1.1 2021-10-04  
contributoR 0.3.0 2022-10-12  
crayon 1.5.2 2022-09-29  
crosstalk 1.2.0 2021-11-04  
datawizard 0.6.2 2022-10-04  
DBI 1.1.3 2022-06-18  
devtools 2.4.5 2022-10-11  
digest 0.6.29 2021-12-01  
distributional 0.3.1 2022-09-02  
dplyr 1.0.10 2022-09-01  
DT 0.25 2022-09-12  
dygraphs 1.1.1.6 2018-07-11  
effectsize 0.8.0 2022-10-09  
ellipsis 0.3.2 2021-04-29  
emmeans 1.8.1-1 2022-09-08  
estimability 1.4.1 2022-08-05  
evaluate 0.17 2022-10-07  
extrafont 0.18 2022-04-12  
extrafontdb 1.0 2012-06-11  
fansi 1.0.3 2022-03-24  
farver 2.1.1 2022-07-06  
fastmap 1.1.0 2021-01-25  
forcats 0.5.2 2022-08-19  
fs 1.5.2 2021-12-08  
ganttrify 0.0.0.9008 2022-10-12  
generics 0.1.3 2022-07-05  
ggbeeswarm 0.6.0 2017-08-07  
ggdist 3.2.0 2022-07-19  
ggplot2 3.3.6 2022-05-03  
ggrepel 0.9.1 2021-01-15  
ggridges 0.5.4 2022-09-26  
glue 1.6.2 2022-02-24  
gridExtra 2.3 2017-09-09  
gtable 0.3.1 2022-09-01  
gtools 3.9.3 2022-07-11  
here 1.0.1 2020-12-13  
highr 0.9 2021-04-16  
hms 1.1.2 2022-08-19  
htmltools 0.5.3 2022-07-18  
htmlwidgets 1.5.4 2021-09-08  
httpuv 1.6.6 2022-09-08  
igraph 1.3.5 2022-09-22  
inline 0.3.19 2021-05-31  
insight 0.18.5 2022-10-12  
knitr 1.40 2022-08-24  
later 1.3.0 2021-08-18  
lattice 0.20-45 2021-09-22  
lifecycle 1.0.3 2022-10-07  
loo 2.5.1 2022-03-24  
magrittr 2.0.3 2022-03-30  
markdown 1.1 2019-08-07  
Matrix 1.5-1 2022-09-13  
matrixStats 0.62.0 2022-04-19  
memoise 2.0.1 2021-11-26  
mime 0.12 2021-09-28  
miniUI 0.1.1.1 2018-05-18  
munsell 0.5.0 2018-06-12  
mvtnorm 1.1-3 2021-10-08  
nlme 3.1-160 2022-10-10  
papaja 0.1.1 2022-07-05  
parameters 0.19.0 2022-10-05  
patchwork 1.1.2 2022-08-19  
pillar 1.8.1 2022-08-19  
pkgbuild 1.3.1 2021-12-20  
pkgconfig 2.0.3 2019-09-22  
pkgload 1.3.0 2022-06-27  
plyr 1.8.7 2022-03-24  
png 0.1-7 2013-12-03  
posterior 1.3.1 2022-09-06  
prettyunits 1.1.1 2020-01-24  
printy 0.0.0.9003 2022-10-17  
processx 3.7.0 2022-07-07  
profvis 0.3.7 2020-11-02  
promises 1.2.0.1 2021-02-11  
ps 1.7.1 2022-06-18  
purrr 0.3.5 2022-10-06  
R6 2.5.1 2021-08-19  
Rcpp 1.0.9 2022-07-08  
RcppParallel 5.1.5 2022-01-05  
readr 2.1.3 2022-10-01  
readxl 1.4.1 2022-08-17  
remotes 2.4.2 2021-11-30  
reshape2 1.4.4 2020-04-09  
rlang 1.0.6 2022-09-24  
rmarkdown 2.17 2022-10-07  
rprojroot 2.0.3 2022-04-02  
rstan 2.21.7 2022-09-08  
rstantools 2.2.0 2022-04-08  
rstudioapi 0.14 2022-08-22  
Rttf2pt1 1.3.11 2022-10-08  
scales 1.2.1 2022-08-20  
sessioninfo 1.2.2 2021-12-06  
shiny 1.7.2 2022-07-19  
shinyjs 2.1.0 2021-12-23  
shinystan 2.6.0 2022-03-03  
shinythemes 1.2.0 2021-01-25  
StanHeaders 2.21.0-7 2020-12-17  
stringi 1.7.8 2022-07-11  
stringr 1.4.1 2022-08-20  
svUnit 1.0.6 2021-04-19  
tensorA 0.36.2 2020-11-19  
threejs 0.3.3 2020-01-21  
tibble 3.1.8 2022-07-22  
tidybayes 3.0.2 2022-01-05  
tidyr 1.2.1 2022-09-08  
tidyselect 1.2.0 2022-10-10  
timeDate 4021.106 2022-09-30  
timeSeries 4021.104 2022-07-17  
tinylabels 0.2.3 2022-02-06  
tzdb 0.3.0 2022-03-28  
urlchecker 1.0.1 2021-11-30  
usethis 2.1.6 2022-05-25  
utf8 1.2.2 2021-07-24  
vctrs 0.4.2 2022-09-29  
vipor 0.4.5 2017-03-22  
vroom 1.6.0 2022-09-30  
withr 2.5.0 2022-03-03  
writexl 1.4.0 2021-04-20  
xfun 0.33 2022-09-12  
xtable 1.8-4 2019-04-21  
xts 0.12.1 2020-09-09  
yaml 2.3.5 2022-02-21  
zoo 1.8-11 2022-09-17