Convergence
Acoustic cues and phonetic categories
language production (Morel, 2013)
Measure using laboratory tasks (Olmstead, Viswanathan, & Bent, 2008; Pardo, 2006) and may be difficult to
Lots of noise
Natural Setting
Voiced
ghost
bat
dip
tart
tip
/P/

METHOD
Participants solved puzzles in the computer game Minecraft
30 word-initial voicing minimal pairs provided key information that
interlocutors had to provide to each other
Measured degree to which VOT values converged over the
course of the one hour experiment

INTRODUCTION
Acoustic cues and phonetic categories
Listeners map cues onto phonetic categories
However, cues are variable and context-dependent
Convergence
Interlocutors often show increased similarity in phonetic cues
during conversational speech (phonetic convergence)
Extent to which talkers converge is affected by a number of factors
(Bradlow & Bent, 2008; Pardo, 2006) and may be difficult to
measure using laboratory tasks (Olmstead, Viswanathan, Alvar, &
Manuel, 2013)
More engaging tasks have been found to have an effect on
language production (Toscano, Buxó-Lugo, & Watson, 2015)

RESULTS
1. Analysis Approach
2. Patterns of VOT Change

3. Effect of Task Difficulty (Time to Completion)
Participants completing all six blocks in one hour

4. VOT Distributions

DISCUSSION
Summary of Results
Some subjects showed phonetic convergence, whereas others diverged
Overall, subjects who took longer to complete the task
converged more, whereas subjects who completed the
experiment more quickly were less likely to converge
We also examined the overall distribution of VOT values,
comparing them with previous measures for English (Lisker
& Abramson, 1964). Mean VOT values for voiced and
voiceless stops were longer than what has been previously
reported (voiced VOT: 25 ms; voiceless VOT: 101 ms)

Conclusions
Together, these results suggest that engaging, naturalistic
tasks may yield results that more accurately reflect real-
world phonetic variation than traditional laboratory
experiments.

Future Directions
Future studies will look at how interlocutors with different
native language backgrounds converge.

ACKNOWLEDGEMENTS & REFERENCES

Thank you to our team of super coders: Jacklyn Coelho,
Nicole Johnson, John Michael Kay, Rakshana
Selvarajan, and Christopher Burley; thanks to David
Saltzman and Michael Phelan for help programming the
Minecraft puzzles, and thanks to Emma Folk for
assistance with running subjects. TMB was supported by
a Villanova Graduate Student Fellowship.

References
study of voicing in initial stops: Acoustical
Olmstead, A. J., Viswanathan, N., Alvar, M. P., & Manuel,
S. (2013). Comparison of native and non-native
phone imitation by English and Spanish speakers.
Frontiers in psychology, 4.
conversational interaction. Journal of the Acoustical
Society of America, 119, 2382–93.
Using game-based approaches to increase level of
engagement in research and education.
In TeacherCraft (pp. 139–151). ETC Press.