

## Ben Parrell

Dept. of Communication Sciences & Disorders  
University of Wisconsin–Madison  
1975 Willow Dr.  
Madison, WI 53706

smac.waisman.wisc.edu  
bparrell@wisc.edu  
+1 608-957-1371  
he/him/his

### Academic Appointments

- 2017-current     Assistant Professor, Department of Communication Sciences & Disorders  
Faculty Trainer, Neuroscience Training Program  
*University of Wisconsin–Madison*
- 2015-2017     Assistant Professor, Department of Linguistics & Cognitive Science  
Faculty, Biomechanics and Movement Science program  
*University of Delaware*
- 2014-2015     NIH NRSA Postdoctoral fellow, Department of Psychology  
*University of California, Berkeley*

### Education

- 2014     Ph.D., Linguistics  
*University of Southern California*
- 2013     Diploma in Innovation  
*University of Southern California*
- 2009     M.A., Linguistics  
*University of Southern California*
- 2006-2007     Visiting Academic  
*Universitat Rovira i Virgili (Tarragona, Spain)*
- 2004     B.A., Spanish, *summa cum laude* with departmental honors  
*University of Oregon*

### Publications

\* denotes equal contribution, \_\_\_\_\_ denotes trainee

#### **Journal Publications**

Pre-prints / submitted

J. Gaines, K. Kim, **B. Parrell**, V. Ramanarayanan, S. Nagarajan, & J. Houde (submitted). Discrete constriction locations describe a comprehensive range of vocal tract shapes in the Maeda model.

L. Hantzsch, **B. Parrell\***, & C. Niziolek\* (2021). A single exposure to altered auditory feedback causes observable sensorimotor adaptation in speech. *bioRxiv*. doi: 10.1101/2021.07.26.453857

B. Roop, **B. Parrell**, & A. Lammert (2021). A compressive sensing approach to inferring cognitive representations with reverse correlation. *bioRxiv*. doi: 10.1101/2021.09.02.458720

D. Tang, **B. Parrell\***, & C. Niziolek\* (2021). Variability is actively regulated in speech. *bioRxiv*. doi: 10.1101/2021.10.08.462639

- 2021 **B. Parrell**, H. Kim, A. Breska, A. Saxena, & R. Ivry (online ahead of press). Differential effects of cerebellar degeneration on feedforward versus feedback control across speech and reaching movements. *Journal of Neuroscience*. doi: 10.1523/JNEUROSCI.0739-21.2021
- R. Karlin, C. Naber, & **B. Parrell** (2021). Auditory feedback is used for both online and adaptive control of timing in speech. *Journal of Speech, Language, and Hearing Research*, 64, 3361-3381. doi: 10.1044/2021\_JSLHR-21-00021
- B. Parrell** (2021). A potential role for reinforcement learning in speech production. *Journal of Cognitive Neuroscience*, 33, 1470–1486. doi: 10.1162/jocn\_a\_01742
- B. Parrell**, R. Ivry, S. Nagarajan, & J. Houde (2021). Intact correction for self-produced vowel formant variability in individuals with cerebellar ataxia regardless of auditory feedback availability. *Journal of Speech, Language, and Hearing Research*, 64, 2234-2247. doi: 10.1044/2021\_JSLHR-20-00270
- B. Parrell\*** & C. Niziolek\* (2021). Increased speech contrast induced by sensorimotor adaptation to a non-uniform auditory perturbation. *Journal of Neurophysiology*, 125, 638-647. doi: 10.1152/jn.00466.2020
- C. Niziolek\* & **B. Parrell\*** (2021). Responses to auditory feedback manipulations may be affected by previous exposure to auditory errors. *Journal of Speech, Language, and Hearing Research*, 64, 2169-2181. doi: 10.1044/2020\_JSLHR-20-00263
- Y. Lee, L. Goldstein, **B. Parrell**, & D. Byrd (2021). Who converges? Variation reveals individual speaker adaptability. *Speech Communication*, 131, 22-34. doi: 10.1016/j.specom.2021.05.001
- 2020 H. Kothare, I. Raharjo, V. Ramanarayanan, K. Ranasinghe, **B. Parrell**, K. Johnson, J. Houde, & S. Nagarajan (2020). Sensorimotor adaptation of speech depends on the direction of auditory feedback alteration. *Journal of the Acoustical Society of America*, 148, 3682. doi: 10.1121/10.0002876
- J. Krivokapic, W. Styler, & **B. Parrell** (2020). Pause postures: the relationship between articulation and cognitive processes during pauses. *Journal of Phonetics*, 79, 100953. doi: 10.1016/j.wocn.2019.100953.
- 2019 **B. Parrell\*** & A. Lammert\* (2019). Bridging dynamical and optimal approaches to speech motor control with Dynamic Movement Primitives. *Frontiers in Psychology*, 10, 2251. doi: 10.3389/fpsyg.2019.02251.
- B. Parrell\***, V. Ramanarayanan\*, S. Nagarajan, & J. Houde (2019). The FACTS model of speech motor control: fusing state estimation and task-based control. *PLoS Computational Biology*, 15(9), e1007321. doi: 10.1371/journal.pcbi.1007321.
- B. Parrell** & J. Houde (2019). Modeling the role of sensory feedback in speech motor control and learning. *Journal of Speech, Language, and Hearing Research*, 62, 2963-2985. doi: 10.1044/2019\_JSLHR-S-CSMC7-18-0127.

- 2019 J. Houde, J. Gill, Z. Agnew, H. Kothare, G. Hickok, **B. Parrell**, R. Ivry, S. Nagarajan (2019). Abnormally increased vocal responses to pitch feedback perturbations in patients with cerebellar degeneration. *Journal of the Acoustical Society of America*, 145, EL372. doi: 10.1121/1.5100910.
- B. Parrell\***, A. Lammert\*, G. Ciccarelli, & T. Quatieri (2019). Current models of speech motor control: A control-theoretic overview of architectures and properties. *Journal of the Acoustical Society of America*, 145, 1456. doi: 10.1121/1.5092807.
- 2018 Y. Lee, S. Gordon Danner, **B. Parrell**, S. Lee, L. Goldstein, & D. Byrd (2018). Articulatory, acoustic, and prosodic accommodation in a cooperative maze navigation task. *PLoS One*, 13(8), e0201444. doi: 10.1371/journal.pone.0201444.
- B. Parrell** & S. Narayanan (2018). Explaining coronal reduction: prosodic structure and articulatory posture. *Phonetica*, 75(2), 151-181. doi: 10.1159/000481099.
- 2017 **B. Parrell**, Z. Agnew, J. Houde, S. Nagarajan, & R. Ivry (2017). Impaired feedforward control and enhanced feedback control of speech in patients with cerebellar degeneration. *Journal of Neuroscience*, 37(38), 9249-9258. doi: 10.1523/JNEUROSCI.3363-16.2017.
- 2014 **B. Parrell**, L. Goldstein, S. Lee, & D. Byrd (2014). Spatiotemporal coupling between speech and manual motor actions. *Journal of Phonetics*, 42, 1-11. doi: 10.1016/j.wocn.2013.11.002.
- 2013 **B. Parrell**, S. Lee, & D. Byrd (2013). Evaluation of prosodic juncture strength using functional data analysis. *Journal of Phonetics*, 41(6), 442-452. doi: 10.1016/j.wocn.2013.08.001.
- 2012 **B. Parrell** (2012). The role of gestural phasing in Western Andalusian Spanish aspiration. *Journal of Phonetics*, 40(1), 37-45. doi: 10.1016/j.wocn.2011.08.004.
- 2011 **B. Parrell** (2011). A dynamical account of how /b, d, g/ differ from /p, t, k/ in Spanish: evidence from labials. *Laboratory Phonology*, 2(2), 423-450. doi: 10.1515/labphon.2011.016.
- B. Parrell** (2011). Articulatory Phonology and the Task Dynamics model. *Studies in Hispanic and Lusophone Linguistics*, 4(2), 531-542. doi: 10.1515/shll-2011-1112.

***Papers in Peer-Reviewed Conference Proceedings***

- 2021 T. Chen, A. Lammert, & **B. Parrell**. (2021) Modeling Sensorimotor Adaptation in Speech Through Alterations to Forward and Inverse Models. Proceedings of Interspeech 2021, 3201-3205, doi: 10.21437/Interspeech.2021-1746
- B. Parrell**, M. Tiede, V. Gracco, & D. Shiller (2021). Kinematic evidence of centering during vowel production. Proceedings of the 12<sup>th</sup> International Seminar on Speech Production, held virtually, December 2020.

- 2018 **B. Parrell\***, V. Ramanarayanan\*, S. Nagarajan, & J. Houde (2018). FACTS: A hierarchical task-based control model of speech incorporating sensory feedback. Proceedings of Interspeech 2018, 1497-1501. doi: 10.21437/Interspeech.2018-2087
- 2016 V. Ramanarayanan\*, **B. Parrell\***, L. Goldstein, S. Nagarajan, & J. Houde (2016). A New Model of Speech Motor Control based on Task Dynamics and State Feedback. Proceedings of Interspeech 2016 , 3564-3568. doi: 10.21437/Interspeech.2016-1499
- 2014 **B. Parrell** & S. Narayanan (2014). Interaction between general prosodic factors and language-specific articulatory patterns underlies divergent outcomes of coronal stop reduction. In Proceedings of the tenth International Seminar on Speech Production, Cologne, Germany, May 2014.
- 2011 **B. Parrell**, L. Goldstein, S. Lee, & D. Byrd (2011). Temporal coupling between speech and manual motor actions. Proceedings of the ninth International Seminar on Speech Production, Montreal, Canada, June 2011.
- 2010 **B. Parrell**, S. Lee & D. Byrd (2010). Evaluation of juncture strength using articulatory synthesis of prosodic gestures and Functional Data Analysis. Proceedings of Speech Prosody V, Chicago, Illinois, May 2010.
- B. Parrell**, L. Goldstein, S. Lee & D. Byrd (2010). Articulatory evidence for functional coupling of speech and non-speech motor tasks. Proceedings of Speech Prosody V, Chicago, Illinois, May 2010.

### ***Book Chapters***

- 2009 M. Riera, J. Romero, & **B. Parrell** (2009). Schwa in American English V+/r/ sequences. In M. Vigário, S. Frota, & M.J. Freitas (Eds.), *Phonetics and Phonology: Interactions and interrelations*. John Benjamins: Amsterdam.

### **Honors, Fellowships, and Awards**

- 2019 Grant Writing Bootcamp  
*University of Wisconsin-Madison, College of Letters & Sciences*
- 2019 “Lessons for Success” Conference Fellow  
*American Speech, Language and Hearing Association*
- 2019, Spring University Housing Honored Instructor Award  
*University of Wisconsin–Madison*
- 2018, Spring University Housing Honored Instructor Award  
*University of Wisconsin–Madison*
- 2012-2013 Russell Fellowship  
*The Graduate School, University of Southern California*
- 2012 Raymond H. Stetson scholarship in phonetics and speech science  
*Acoustical Society of America*
- 2012 Best paper award for students and young professionals (second place):  
“How tongue posture differences affect reduction in coronals: Differences between Spanish and English”  
*164th Meeting of the Acoustical Society of America, Kansas City, MO*

- 2010-2012 NIH NRSA Pre-doctoral fellowship (T32), Hearing and Communication Neuroscience Training Program  
*University of Southern California/House Research Institute*
- 2010 Scholarship to attend the São Paulo School of Advanced Studies in Speech Dynamics (June 2010)  
*Fundação de Amparo à Pesquisa do Estado de São Paulo*
- 2010 Best student paper (with Sungbok Lee & Dani Byrd):  
“Evaluation of juncture strength using articulatory synthesis of prosodic gestures and Functional Data Analysis”  
*Speech Prosody V, Chicago, IL*
- 2007-2008 Del Amo Graduate Fellowship  
*University of Southern California*

## **Funding**

### ***External grants***

- 2021-2026 “Establishing the clinical utility of sensorimotor adaptation for speech rehabilitation”  
R01 DC019134 (PI: Parrell & Niziolek)  
*National Institute on Deafness and other Communication Disorders*  
Role: Co-PI
- 2021-2024 “Sensorimotor adaptation as a window to speech movement planning”  
BCS 2120506 (PI: Parrell & Niziolek)  
*National Science Foundation*  
Role: Co-PI
- 2021-2023 “Cerebellar contributions to temporal deficits in ataxic dysarthria”  
F32 DC019535 (PI: Karlin)  
*National Institute on Deafness and other Communication Disorders*  
Role: Primary sponsor
- 2018-2023 “The role of the cerebellum in speech”  
R01 DC017091 (PI: Houde)  
*National Institute on Deafness and other Communication Disorders*  
Role: Co-Investigator (subcontract PI)  
Total direct costs to subcontract: \$964,215
- 2018-2021 “CRCNS: Modeling the role of auditory feedback in speech motor control”  
R01 DC017696 (PI: Houde)  
*National Institute on Deafness and other Communication Disorders*  
Role: Co-Investigator (subcontract PI)  
Total direct costs to subcontract: \$46,083
- 2014-2015 “Control of duration in speech and temporal deficits in Ataxic Dysarthria”  
F32 DC014211, NIH Ruth L. Kirschstein National Research Service Award  
*National Institute on Deafness and other Communication Disorders*  
Role: PI  
Total direct costs: \$49,850

**Internal grants**

- 2020-2021 “Modulating speech behavior to predict the effectiveness of sensorimotor training”  
*University of Wisconsin–Madison Fall Competition*  
Role: Co-PI  
Total costs: \$70,607
- 2016-2018 “Reinforcement learning in speech motor control”  
*University of Delaware Research Foundation*  
Role: PI  
Total costs: \$35,000
- 2012-2013 “Ultrasound imaging and automatic quantification of glottal dynamics during speech”  
*University of Southern California Diploma in Innovation grant*  
Role: co-PI (with Adam Lammert)  
Total costs: \$5,000
- 2012 Del Amo Research Award  
*University of Southern California*  
Total costs: \$4,000
- 2011 Del Amo Research Award  
*University of Southern California*  
Total costs: \$3,200
- 2010 Del Amo Research Award  
*University of Southern California*  
Total costs: \$5,000
- 2009 Del Amo Research Award  
*University of Southern California*  
Total costs: \$5,000
- 2008 Del Amo Research Award  
*University of Southern California*  
Total costs: \$5,000

**Invited Talks and Colloquia**

- 2021 **B. Parrell.** What altered auditory feedback can tell us about speech motor control, planning, and disorders. Department of Communicative Sciences and Disorders seminar, New York University, October 2021.  
**B. Parrell.** Using altered auditory feedback to study speech motor control, SPAN group meeting, University of Southern California, June 2021.
- 2019 **B. Parrell.** Control theory in models of speech production. Articulatory Phonology Workshop, Monterey, CA, July 2019.
- 2018 J. Krivokpić, W. Styler, **B. Parrell.** Articulation during pauses, SPAN group meeting, University of Southern California, August 2018.
- 2017 **B. Parrell.** Feedforward and feedback control in patients with cerebellar degeneration, Neural Bases of Speech Production Symposium, San Francisco, March 2017.

- 2017 **B. Parrell.** Speech as a feedback control system, Department of Communication Sciences & Disorders seminar, University of Wisconsin–Madison, January 2017.
- 2017 **B. Parrell.** A sensory feedback control framework for speech: model architecture, neural bases, and open questions, Staff Talks seminar, Haskins Laboratories, January 2017.
- 2016 **B. Parrell.** The wide world of prosody: Prosodic structure in sound change and prosodic breakdown in disordered speech, Department of Linguistics Thursday Thoughts series, University of Pennsylvania, February 2016.
- 2014 **B. Parrell.** Time and space in speech: control and production, Department of Linguistics and Cognitive Science colloquium, University of Delaware, March 2014.
- B. Parrell.** Time and space in phonology, Department of Hispanic and Italian Studies talk series, University of Illinois at Chicago, January 2014.
- 2011 **B. Parrell.** (New) approaches to old problems: Articulatory Phonological applications in Spanish, Phonetics seminar series, University of California Los Angeles, May 2011.

## Presentations

\* denotes equal contribution, \_\_\_\_\_ denotes trainee

### **Conference Presentations & Published Abstracts**

- 2021 T. Chen, A. Lammert\* & **B. Parrell\*** (2021). Modelling sensorimotor adaptation in speech through alterations to forward and inverse models. Paper presented at Interspeech 2021, Brno, Czechia, August 2021.
- D. Tang, C. Niziolek\* & **B. Parrell\*** (2021). Movement variability is actively regulated in speech. Blitz talk presented at the 2021 Annual meeting of the Society for the Neural Control of Movement, held virtually, April 2021.
- T. Chen, A. Lammert\* & **B. Parrell\*** (2021). Modelling sensorimotor adaptation in speech through alterations to forward and inverse models. Poster presented at the 2021 Boston Speech Motor Control Symposium, held virtually, May 2021.
- R. Karlin & **B. Parrell** (2021). Cross-domain generalizability of cerebellar timing mechanisms. Poster presented at the 2021 Boston Speech Motor Control Symposium, held virtually, May 2021.
- R. Karlin, C. Naber, & **B. Parrell** (2021). Effects of /ai/ perturbation on the production of following consonants. Poster presented at the 2021 Boston Speech Motor Control Symposium, held virtually, May 2021.
- J. Krakauer, C. Naber, C. Niziolek\* & **B. Parrell\*** (2021). The Role of Attention in Compensation for Altered Auditory Feedback. Poster presented at the 2021 Boston Speech Motor Control Symposium, held virtually, May 2021.
- 2020 **B. Parrell\*** & A. Lammert\* (2020). Modeling adaptation in speech motor control. Poster presented at the 12th International Seminar on Speech Production, held virtually, December 2020.
- B. Parrell**, M. Tiede, V. Gracco & D. Shiller (2020). Kinematic evidence of centering during vowel production. Poster presented at the 12th International Seminar on Speech Production, held virtually, December 2020.

2020

**B. Parrell\*** & C. Niziolek (2020). Increased vowel contrast induced by adaptation to a non-uniform auditory perturbation in speech. Poster presented at the 12th International Seminar on Speech Production, held virtually, December 2020.

C. Niziolek & **B. Parrell\*** (2020). Formant variability is actively regulated in vowel production. Poster presented at the 12th International Seminar on Speech Production, held virtually, December 2020.

R. Karlin, C. Naber & **B. Parrell** (2020). Auditory feedback is used for both online and adaptive control of timing in speech. Poster presented at the 12th International Seminar on Speech Production, held virtually, December 2020.

J. Gaines, H. Kothare, I. Raharjo, K. Ranasinghe, R. Ivry, **B. Parrell**, Z. Agnew, S. Nagarajan & J. Houde (2020). State feedback control model can account for differences in abnormal pitch perturbation responses in Alzheimer's disease and cerebellar ataxia. Poster presented at the 12th International Seminar on Speech Production, held virtually, December 2020.

J. Gaines, K. Kim, **B. Parrell**, V. Ramanarayanan, S. Nagarajan & J. Houde (2020). Discrete constriction locations describe a comprehensive range of vocal tract shapes in the Maeda model. Poster presented at the 12th International Seminar on Speech Production, held virtually, December 2020.

**B. Parrell\*** & C. Niziolek (2020). Increased vowel contrast induced by adaptation to a non-uniform auditory perturbation in speech. Poster presented at the 179th Meeting of the Acoustical Society of America (Acoustics Virtually Everywhere), held virtually, December 2020.

C. Niziolek & **B. Parrell\*** (2020). Formant variability is actively regulated in vowel production. Poster presented at the 179th Meeting of the Acoustical Society of America (Acoustics Virtually Everywhere), held virtually, December 2020.

R. Karlin, C. Naber, **B. Parrell** (2020). Auditory feedback is used for both online and adaptive control of timing in speech. Poster presented at the 179th Meeting of the Acoustical Society of America (Acoustics Virtually Everywhere), held virtually, December 2020.

C. Niziolek\* & **B. Parrell\*** (2020). Increased vowel contrast induced by adaptation to a non-uniform auditory perturbation in speech. Poster presented at the 12th annual meeting of the Society for the Neurobiology of Language, held virtually, October 2020.

**B. Parrell\*** & C. Niziolek\* (2020). Movement variability is actively regulated in speech. Talk accepted for presentation at the 30th annual meeting of the Society for the Neural Control of Movement, Dubrovnik, Croatia, May 2020 [*conference cancelled due to COVID-19*].

T. Chen & **B. Parrell** (2020). Generalization of speech motor learning in vowel space area. Poster presented at the UW–Madison Undergraduate Research Symposium, held virtually, April 2020.



- 2020 **B. Parrell**, S. Nagarajan, R. Ivry & J. Houde (2020). Patients with cerebellar degeneration correct for sub-categorical vowel variation even when auditory feedback is blocked. Talk presented at the 2020 Speech Motor Conference, Santa Barbara, CA, February 2020.
- V. Ramanarayanan\*, **B. Parrell\***, S. Nagarajan & J. Houde (2020). Simulating adaptation in the FACTS model of speech motor control. Poster presented at the 2020 Speech Motor Conference, Santa Barbara, CA, February 2020.
- B. Parrell\*** & C. Niziolek\* (2020). Assessing the consistency of compensation for auditory errors across error sources, testing sessions, and changes in feedback reliability. Poster presented at the 2020 Speech Motor Conference, Santa Barbara, CA, February 2020.
- 2019 **B. Parrell\*** & C. Niziolek\* (2019). Assessing the consistency of compensation for auditory errors across error sources, testing sessions, and changes in feedback reliability. Poster presented at Society for Neuroscience 2019, Chicago, IL, October 2019.
- T. Chen & **B. Parrell** (2019). Unreliable auditory feedback leads to decreased sensitivity to auditory errors. Poster presented at the UW–Madison Undergraduate Research Symposium, Madison, WI, April 2019.
- J. Houde, **B. Parrell**, V. Ramanarayanan & S. Nagarajan (2019). The FACTS model: using state estimation and task-based feedback control to model the speech motor system. Poster presented at the Cognitive Neuroscience Society 2019 meeting, San Francisco, CA, March 2019.
- B. Parrell\*** & C. Niziolek\* (2019). Previous exposure to sensory feedback noise causes a decrease in online compensation for sensory perturbations in speech. Talk presented at Neural Bases of Speech Production Symposium, San Francisco, CA, March 2019.
- 2018 **B. Parrell**, H. Kim, A. Breska, A. Saxena & R. Ivry (2018). Augmented use of feedback for online control in patients with cerebellar ataxia across different motor domains. Poster presented at Society for Neuroscience 2018, San Diego, CA, November 2018.
- H. Kothare, I. Raharjo, K. Ranasinghe, V. Ramanarayanan, **B. Parrell** & J. Houde, S. Nagarajan (2018). Sensorimotor adaptation in speech is sensitive to vowel targets of altered feedback. Poster presented at the 10th annual meeting of the Society for the Neurobiology of Language, Quebec City, Quebec, Canada, August 2018.
- B. Parrell\***, V. Ramanarayanan\*, S. Nagarajan & J. Houde (2018). A hierarchical task-based control model of speech incorporating sensory feedback. Talk presented at the Madonna Motor Speech Conference, Savannah, GA, February 2018.
- 2017 W. Styler, J. Krivokapic, **B. Parrell** & J. Kim (2017). Using machine learning to identify articulatory gestures in time course data. *Journal of the Acoustical Society of America* 142, 2579.
- J. Krivokapic, W. Styler, **B. Parrell** & J. Kim (2017). Pause postures in American English. *Journal of the Acoustical Society of America* 142, 2584.

2017

**B. Parrell** (2017). Evidence for reward learning in speech production. Poster presented at Society for Neuroscience 2017, Washington, DC, November 2017.

**B. Parrell\***, V. Ramanarayanan\*, S. Nagarajan & J. Houde (2017). A hierarchical state feedback control model for speech simulates task-specific responses to auditory and articulatory perturbations. Poster presented at the 7th International Conference on Speech Motor Control, Groningen, the Netherlands, July 2017. (\*equal contribution)

**B. Parrell** (2017). Evidence for reward learning in speech production. Poster presented at the 7th International Conference on Speech Motor Control, Groningen, the Netherlands, July 2017.

J. Houde, S. Nagarajan, **B. Parrell** & V. Ramanarayanan (2017). Advances in modeling speech production as state feedback control. Talk presented at the 7th International Conference on Speech Motor Control, Groningen, the Netherlands, July 2017.

**B. Parrell**, Z. Agnew, J. Houde, S. Nagarajan & R. Ivry (2017). Cerebellar damage leads to changes in both feedforward and feedback control of speech. Poster presented at the 2017 Boston Speech Motor Control Mini-Symposium, Boston, MA, March 2017.

2016

**B. Parrell**, Z. Agnew, J. Houde, S. Nagarajan & R. Ivry (2016) Individuals with cerebellar degeneration correct for within-category variation of vowels even in the absence of auditory feedback. Talk presented at Society for Neuroscience 2016, San Diego, CA, November 2016.

H. Kothare, V. Ramanarayanan, **B. Parrell**, J. Houde & S. Nagarajan (2016). Sensorimotor adaptation to real-time formant shifts is influenced by the direction and magnitude of shift. Talk presented at Society for Neuroscience 2016, San Diego, CA, November 2016.

Y. Lee, S. Gordon Danner, **B. Parrell**, S. Lee, L. Goldstein & D. Byrd (2016). Acoustic and articulatory measures of prosodic convergence in a cooperative maze navigation task. Poster presented at the 5th Joint Meeting of the Acoustical Society of America and Acoustical Society of Japan, Honolulu, HI, November 2016.

V. Ramanarayanan\*, **B. Parrell\***, L. Goldstein, S. Nagarajan & J. Houde (2016). A New Model of Speech Motor Control based on Task Dynamics and State Feedback. Talk presented at SECNS 2016: The 1st Workshop on Speech Engineering and Computational Neuroscience of Speech, San Francisco, CA, September 2016. (\*equal contribution)

V. Ramanarayanan\*, **B. Parrell\***, L. Goldstein, S. Nagarajan & J. Houde (2016). A New Model of Speech Motor Control based on Task Dynamics and State Feedback. Talk presented at Interspeech 2016, San Francisco, CA, September 2016. (\*equal contribution)

Y. Lee, S. Gordon Danner, **B. Parrell**, S. Lee, L. Goldstein & D. Byrd (2016). Prosodic Convergence During and After a Cooperative Maze Task. Poster presented at LabPhon 15, Ithaca, NY, July 2016.

- 2015 **B. Parrell, J. Houde, S. Nagarajan & R. Ivry.** (2015) Disrupted feedforward but spared feedback control during speech in patients with cerebellar degeneration. Poster presented at Society for Neuroscience 2015, Chicago, IL, October 2015.
- 2015 **B. Parrell, J. Houde, S. Nagarajan & R. Ivry.** (2015) Disrupted feedforward but spared feedback control during speech in patients with cerebellar degeneration. Poster presented at the Seventh Annual Meeting of the Society for the Neurobiology of Language, Chicago, IL, October 2015.
- 2014 **B. Parrell & S. Narayanan** (2014). Interaction between general prosodic factors and language-specific articulatory patterns underlies divergent outcomes of coronal stop reduction. Talk presented at the 10th International Seminar on Speech Production, Cologne, Germany, May 2014.
- 2013 **B. Parrell, A. Lammert, S. Narayanan & L. Goldstein** (2013). Simulations of sound change resulting from a production-recovery loop. *Journal of the Acoustical Society of America*, 134(5), 4167.
- 2012 **B. Parrell** (2012). How tongue posture differences affect reduction in coronals: Differences between Spanish and English. *Journal of the Acoustical Society of America*, 132(3), 1936.
- 2011 **B. Parrell, A. Lammert, L. Goldstein, D. Byrd, & S. Narayanan** (2011). Imaging and quantification of glottal kinematics with ultrasound during speech. *Journal of the Acoustical Society of America*, 130(4), 2548.
- B. Parrell, L. Goldstein, S. Lee, & D. Byrd** (2011). Temporal coupling between speech and manual motor actions. Poster presented at the ninth International Seminar on Speech Production, Montreal, Canada, June 2011.
- B. Parrell & S. Tilsen** (2011). Control of duration and magnitude in speech imitation. Paper presented at the sixth International Conference on Speech Motor Control, Groningen, The Netherlands, June 2011.
- 2010 **B. Parrell** (2010). Articulation from acoustics: estimating constriction degree from the acoustic signal. *Journal of the Acoustical Society of America*, 128(4), 2289.
- B. Parrell, S. Lee, & D. Byrd** (2010). Quantifying prosodic boundary strength using functional data analysis of articulatory movement. *Journal of the Acoustical Society of America*, 128(4), 2289.
- B. Parrell** (2010). Romance lenition revisited: articulatory and model evidence from Spanish. Poster presented at the Workshop on Sound Change, Barcelona, Spain, October 2010.
- B. Parrell, M. Proctor & L. Goldstein** (2010). Towards a computational articulatory model of Spanish phonology. Paper presented at Laboratory Approaches to Romance Phonology, Provo, Utah, September 2010.
- B. Parrell** (2010). How /b d g/ differ from /p t k/ in Spanish: A dynamic account. Paper presented at LabPhon 12, Albuquerque, New Mexico, July 2010.
- B. Parrell** (2010). How /b d g/ differ from /p t k/ in Spanish: A dynamic account. Poster presented at São Paulo School of Advanced Studies in Speech Dynamics, São Paulo, Brazil, June 2010.

- 2010 **B. Parrell, S. Lee & D. Byrd** (2010). Evaluation of juncture strength using articulatory synthesis of prosodic gestures and Functional Data Analysis. Paper presented at Speech Prosody V, Chicago, Illinois, May 2010.
- B. Parrell, L. Goldstein, S. Lee & D. Byrd** (2010). Articulatory evidence for functional coupling of speech and non-speech motor tasks. Poster presented at Speech Prosody V, Chicago, Illinois, May 2010.
- 2009 **B. Parrell** (2009). Rate conditioned aspiration change in Western Andalusian Spanish. Poster presented at the Phonetics and Phonology in Iberia conference, Las Palmas, Spain, June 2009.
- S. Lee, **B. Parrell**, & D. Byrd (2009). Computational modeling of juncture strength using articulatory synthesis of prosodic gestures. *Journal of the Acoustical Society of America*, 125(4), 2572 - 2572.
- B. Parrell** (2009). Rate conditioned variability in Western Andalusian Spanish aspiration. *Journal of the Acoustical Society of America*, 125(4), 2570 - 2570.
- 2008 **B. Parrell** (2008). /s/ + stop gestural reorganization in Western Andalusian Spanish. Poster presented at the Southern California Workshop on Phonetics/Phonology, Pomona, California, November 2008.
- 2007 J. Romero, **B. Parrell**, & M. Riera (2007). What distinguishes /p/, /t/, /k/ from /b/, /d/, /g/ in Spanish? Poster presented at the Phonetics and Phonology in Iberia Conference, Braga, Portugal, June 2007.
- M. Riera, J. Romero, & **B. Parrell** (2007). Schwa in American English V+/r/ sequences. Paper presented at the Phonetics and Phonology in Iberia Conference, Braga, Portugal, June 2007.

***Campus and community talks***

- 2021 What altered auditory feedback can tell us about speech motor control, planning, and disorders. Department of Communication Sciences & Disorders seminar, University of Wisconsin–Madison, October 2021.
- Neural mechanisms of speech motor control. Talk presented at a meeting of the Undergraduate Neuroscience Society, University of Wisconsin–Madison, March 2021.
- 2020 The computational and neurological basis of speech motor control. Zoology 500 guest lecture, University of Wisconsin–Madison, February 2020.
- 2019 The cerebellum: motor control and beyond. Wisconsin Ataxia Support Group meeting, Madison, WI, July 2019.
- From language to action: mechanisms of speech motor control. Language Sciences Colloquium, University of Wisconsin–Madison, March 2019.
- The computational and neurological basis of speech motor control. Zoology 500 guest lecture, University of Wisconsin–Madison, February 2019.
- 2018 Towards a new theory of speech motor control. Department of Communication Sciences & Disorders seminar, University of Wisconsin–Madison, November 2018.

- 2018                    Speech motor control: models, neural bases, and learning. Department of Communications Sciences & Disorders seminar, University of Wisconsin–Madison, April 2018.
- Speech as a dynamical system. Chaos and Complex Systems Seminar, University of Wisconsin–Madison, March 2018.
- 2016                    Cerebellar function in speech motor control: feedforward and feedback processes. Biomechanics and Movement Science seminar, University of Delaware, May 2016.
- Towards a new theory of speech motor control. Department of Linguistics and Cognitive Science colloquium, University of Delaware, May 2016.
- 2015                    The role of the cerebellum in speech motor control: Evidence from speakers with ataxia. Berkeley Phonetics and Phonology Forum, University of California, Berkeley, April 2015.

**Teaching** (\* new course, \*\* redeveloped course)

**University of Wisconsin–Madison**

*Undergraduate courses:*

Speech Science (Anatomy & Physiology of Speech Production)\* (8x, 2017-current)

**University of Delaware**

*Undergraduate courses:*

Laboratory Phonology\*\* (2x, 2015-2017)

Acoustic Phonetics (2x, 2015-2017)

*Graduate courses:*

Acoustic Phonetics (2x, 2015-2017)

Articulatory Phonology\* (2016)

Articulatory and Acoustic Phonetics\* (2017)

**Postgraduate Program in Phonetic Studies, CSIC, Madrid, Spain**

*Graduate courses:*

Articulatory Phonology\* (4x, 2013-2016)

**Mentoring**

**Postdoctoral Trainees**

Dinglan Tang, UW–Madison	2021-current
Robin Karlin, UW–Madison	2019-current

**PhD Dissertation Committees**

Sean Anderson, UW–Madison	In progress
Margarethe McDonald, UW–Madison	2020
Hyun Jin Hwangbo, Univ. Delaware	2018

**PhD Preliminary / Qualifying Committees**

Anne Neveu, UW–Madison	2021
Sean Anderson, UW–Madison	2020
Margarethe McDonald, UW–Madison	2018
Huan Luo, Univ. Delaware	2016
Hyun Jin Hwangbo, Univ. Delaware	2015

**Master's Theses / Research Supervised**

Hung-Shao Cheng, MA research, Univ. Delaware 2017  
Alba Agüete Cajiao, master's thesis, CSIC (Madrid, Spain) 2013

**Master's Thesis Committees**

Helen Vradelis, UW–Madison 2019

**Undergraduate Theses Supervised**

Jenna Krakauer, UW–Madison 2021-2022

**Undergraduate Research Supervised**

Jenna Krakauer, Hilldale research apprenticeship, UW–Madison 2021  
Emma Baumgardt, Undergraduate research scholar, UW–Madison 2020-2021  
Stephanie Zumba, Undergraduate research scholar, UW–Madison 2020  
Taijing Chen, Hilldale research fellowship, UW–Madison 2020  
Jenna Krakauer, Welton research apprenticeship, UW–Madison 2020  
Taijing Chen, Sophomore research fellowship, UW–Madison 2019  
Taijing Chen, Undergraduate research scholar UW–Madison 2017-2018

**Undergraduate & Masters RAs supervised**

*Undergraduate RAs*

Angela Pescatore	2021-current	Stephanie Zumba	2020
Emily Murdoch	2021-current	Liz Markland	2018-2020
Bailey Meyers	2021-current	Samara Lauffer	2018-2020
Amanda Goldstein	2021-current	Shannon Sibrel	2019-2020
MacKenzie Maccaux	2021-current	Dylan Senn	2018-2020
Emily Tesch	2021-current	Brittany Daane	2019
Riya Patel	2020-current	Katrina Connor	2016-2017
Jenna Krakauer	2019-current	Emma Smith	2016-2017
Tahseen Shaik	2019-current	Marissa Montano	2016-2017
Emma Baumgardt	2020-2021	Sabrina Picone	2016-2017
Brenden Mock	2019-2021	Kenneth Schlattmann	2016-2017
Kenzie Bugg	2019-2021		
Kathleen Zarnott	2018-2021		
Taijing Chen	2018-2021		

*MS RAs*

Chris Naber 2019  
Hannah Smith 2019  
Hung-Shao Cheng 2016-2017

**Research Assistants Supervised:**

Chris Naber (research intern), UW–Madison 2020-current  
Lana Hantzsch (lab manager/research assistant), UW–Madison 2020-2021  
Alexa Bushinski (lab manager/research assistant), UW–Madison 2019-2020

**Professional Activities**

***External Service***

Journal Reviews

*Brain and Language*, 2015

*Cerebellar Cortex*, 2021  
*Cognitive Science*, 2017  
*Computer Speech & Language*, 2016  
*Experimental Brain Research*, 2017-2019  
*Frontiers in Psychology*, 2019  
*International Journal of Speech-Language Pathology*, 2019  
*Journal of the Acoustical Society of America*, 2015-2018, 2020  
*Journal of Cognitive Neuroscience*, 2015, 2017, 2020, 2021  
*Journal of the International Phonetic Association*, 2016-2017  
*Journal of Neurophysiology*, 2017  
*Journal of Neuroscience*, 2019  
*Journal of Phonetics*, 2016, 2020  
*Journal of Speech, Language, and Hearing Research*, 2020, 2021  
*Laboratory Phonology*, 2014, 2020  
*Language and Speech*, 2019  
*Loquens: Spanish Journal of Speech Science*, 2014, 2018  
*Neuroscience*, 2020  
*Neuroscience Letters*, 2015  
*Motor Control*, 2014  
*Movement Disorders*, 2021  
*Phonetica*, 2014  
*Phonology*, 2021  
*Scientific Reports*, 2020  
*Quarterly Journal of Experimental Psychology*, 2018, 2019, 2021

Journal Guest Editor

Guest Associate Editor, *Journal of Speech, Language, and Hearing Research*, 2020

Grant Reviews

Ad-hoc reviewer for *Czech Science Foundation*, 2020  
Ad-hoc reviewer for *German Research Foundation (DFG)*, 2018  
Ad-hoc reviewer for *National Science Foundation*, 2015, 2019  
Ad-hoc reviewer for *Ohio University Research Council*, 2017

Conference Abstract Reviews

*2022 Conference on Motor Speech Scientific Review Committee*, 2021-2022  
*LabPhon 17*, 2020  
*LabPhon 16*, 2018  
*LabPhon 15*, 2016  
*International Seminar on Speech Production*, 2014, 2020  
*International Congress of Phonetic Sciences*, 2019  
*Motor Learning and Motor Control Program Committee*, 2020, 2021

***Institutional Service***

2021-current      Search Committee, tenure track faculty search  
                          *Dept. of Communication Sciences and Disorders, University of Wisconsin–  
                          Madison*

2020-current	Admissions Committee <i>Neuroscience Training Program, University of Wisconsin–Madison</i>
2020 (Fall)	Organizer, Professional Development Seminar series (Prosem) <i>Dept. of Communication Sciences and Disorders, University of Wisconsin–Madison</i>
2019-current	Awards Committee <i>Dept. of Communication Sciences and Disorders, University of Wisconsin–Madison</i>
2018-current	Undergraduate Committee <i>Dept. of Communication Sciences and Disorders, University of Wisconsin–Madison</i>
2017-current	Faculty Senator <i>Dept. of Communication Sciences and Disorders, University of Wisconsin–Madison</i>
2017-current	Technology Committee <i>Dept. of Communication Sciences and Disorders, University of Wisconsin–Madison</i>
2016-2017	Colloquium Committee <i>Dept. of Linguistics and Cognitive Science, University of Delaware</i>
2015-2017	Graduate Student Committee <i>Dept. of Linguistics and Cognitive Science, University of Delaware</i>
2015-2016	Search Committee, tenure track faculty search <i>Dept. of Linguistics and Cognitive Science, University of Delaware</i>
2010-2013	Secretary, Hispanic Linguistics Student Association <i>University of Southern California</i>
2009-2010	Vice President, Hispanic Linguistics Student Association <i>University of Southern California</i>
2008-2009	President, Hispanic Linguistics Student Association <i>University of Southern California</i>
2007-2008	Treasurer, Hispanic Linguistics Student Association <i>University of Southern California</i>

***Professional Societies***

Society for Neuroscience  
Society for the Neural Control of Movement

***Languages***

English (Native), Spanish (Fluent), Catalan (Intermediate)