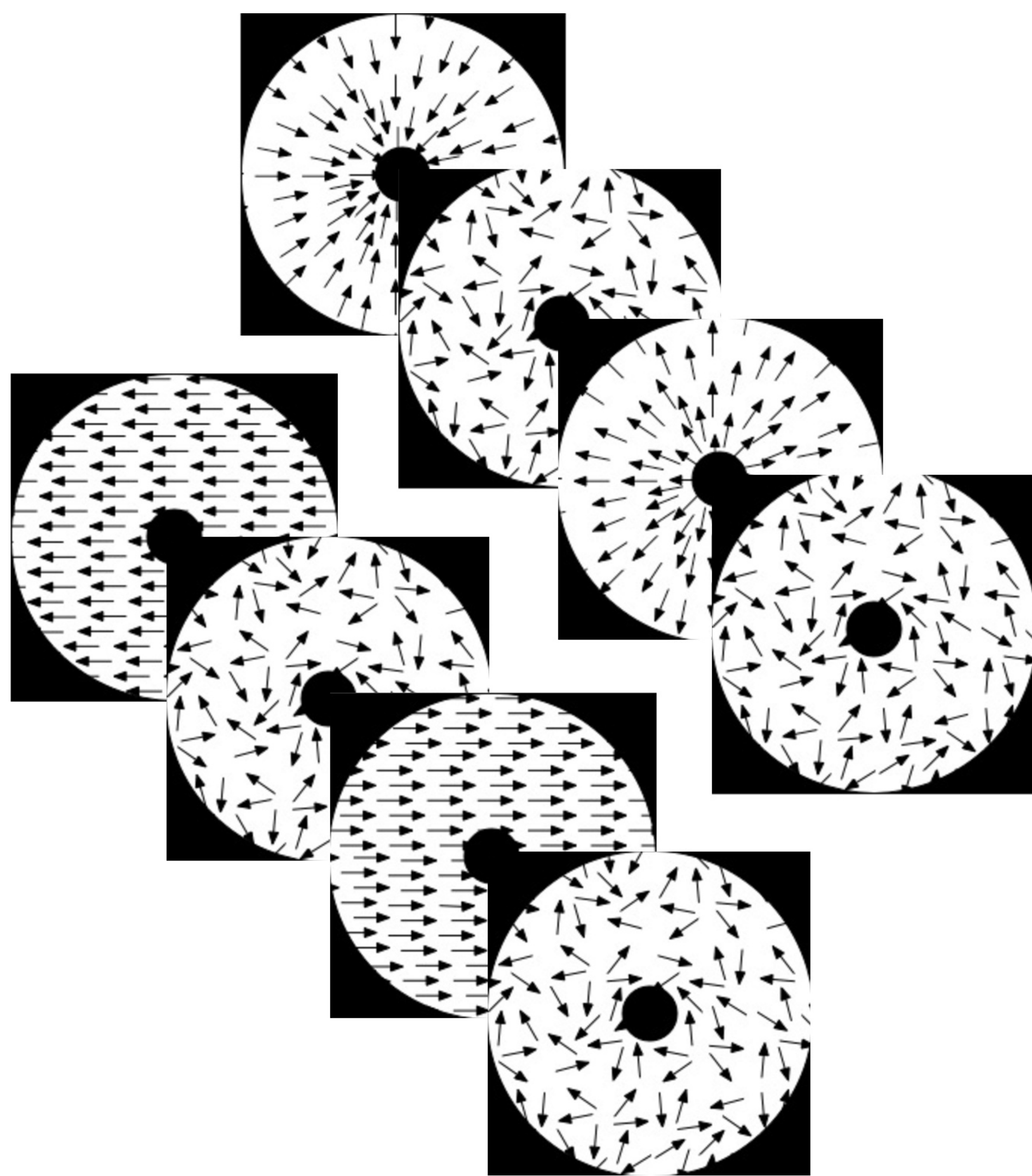


MOTIVATION

Optic flow informs infants' perception of the geometry, speed, and motion of objects in their environment and their own movements through space. Prior research suggests that infants show larger amplitude electroencephalographic (EEG) responses to direction-reversing linear patterns of optic flow [1] than to radial or rotational patterns. Infants also show larger EEG responses to coherence-modulating rotational flow patterns when motion speeds are faster [2]. Moreover, children 4-8 years old show larger amplitude EEG responses to fast radial and rotational optic flow [3], suggesting that the motion processing network undergoes prolonged development throughout childhood.

METHODS & DISPLAY

High density (128 channel) EEG responses were recorded from (n=23; 13 female) 17- to 38-week-old infants who viewed radial and linear optic flow patterns at 2 and 8 deg/s. Motion coherence varied from 100% (coherent) to 0% (incoherent/random) every 833 ms (1F1: 1.2 Hz). EEG data were cleaned and filtered before being subjected to a frequency domain analysis (discrete FFT). Movies of the displays, metadata about the participants, and raw data files are available at <http://databrary.org/volume/218>.



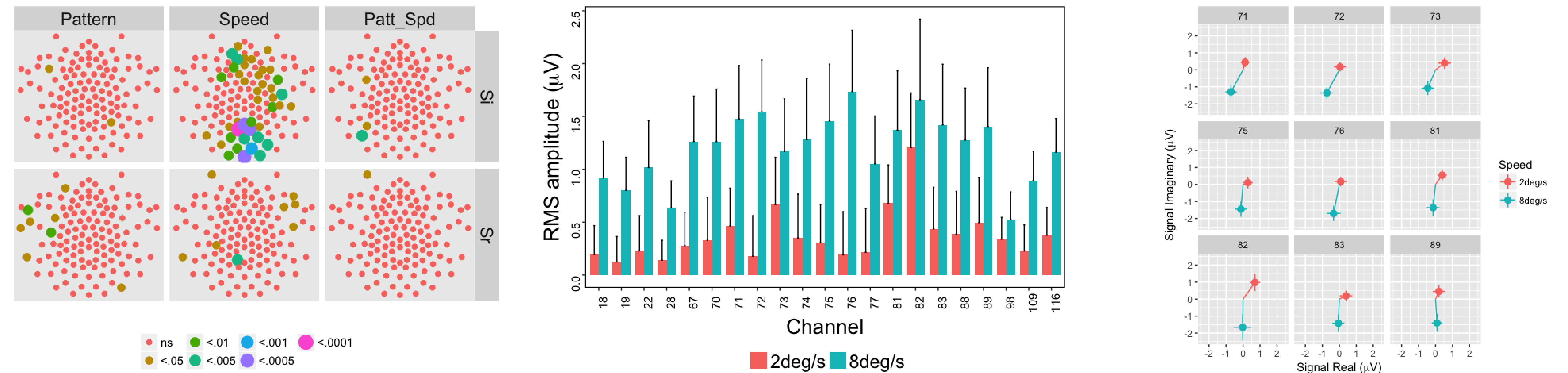
ACKNOWLEDGEMENTS

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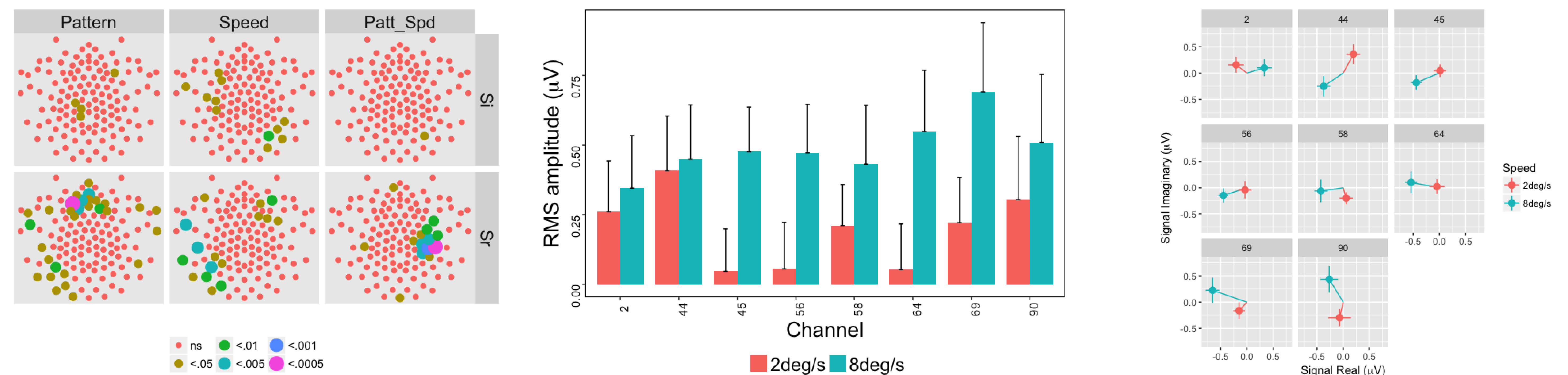
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- [1] R. O. Gilmore, C. Hou, M. W. Pettet, and A. M. Norcia, "Development of cortical responses to optic flow," *Visual neuroscience*, vol. 24, no. 06, pp. 845-856, Nov. 2007. [Online]. Available: http://journals.cambridge.org/article_S0952523807070769
- [2] C. Hou, R. O. Gilmore, M. W. Pettet, and A. M. Norcia, "Spatio-temporal tuning of coherent motion evoked responses in 4-6 month old infants and adults," *Vision research*, vol. 49, no. 20, pp. 2509-2517, Oct. 2009. [Online]. Available: <http://www.sciencedirect.com/science/article/pii/S0042698909003666>
- [3] R. O. Gilmore, A. L. Thomas, and J. Fesi, "Children's brain responses to optic flow vary by pattern type and motion speed," *PLoS one*, vol. 11, no. 6, p. e0157911, Jun. 2016. [Online]. Available: <http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0157911>

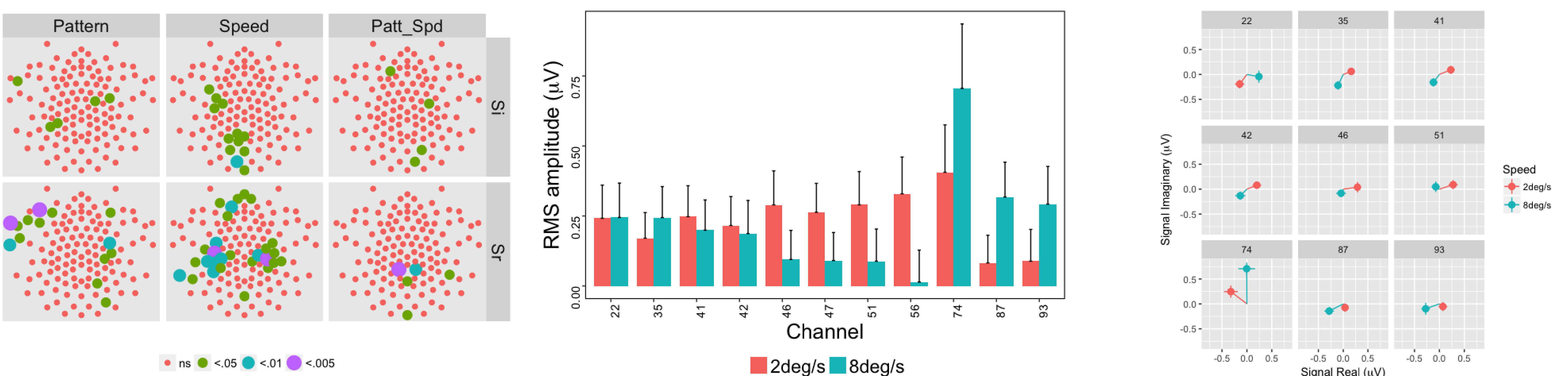
RESULTS: 1F1 (1.2 Hz)



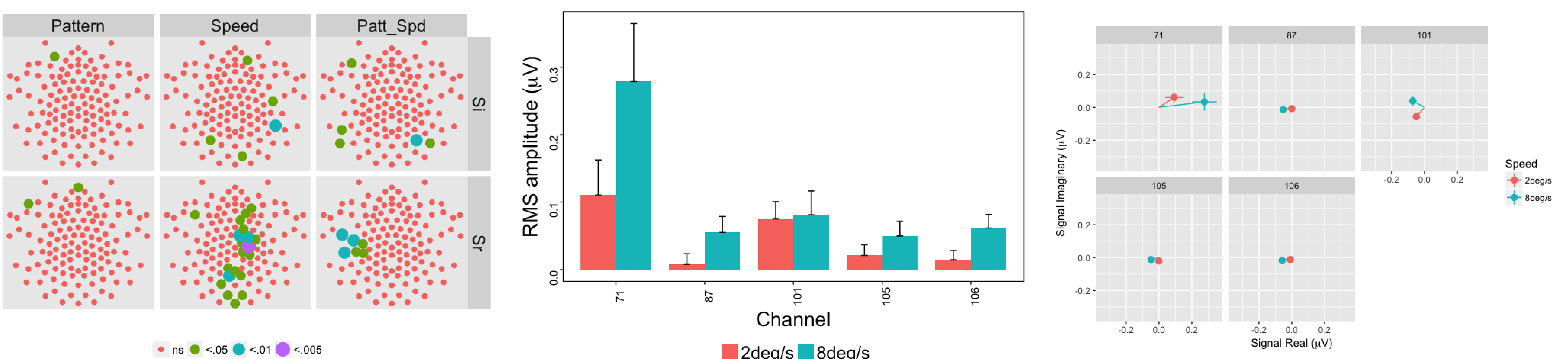
RESULTS: 2F1 (2.4 Hz)



RESULTS: 3F1 (3.6 Hz)



RESULTS: 1F2 (24 Hz)



RESULTS SUMMARY

Faster (8 deg/s) speeds produce larger amplitude responses, consistent with predictions, but radial patterns activate larger amplitude responses than linear ones, contrary to predictions. Channels showing speed or pattern sensitivity differ between infants, children, and adults.