

July 6, 2026

Publications of the Indo-German Eye and Brain Lab

Journal articles

- P39. Hassett, J.D., Hölig, C., Lingareddy, S., Kekunnaya, R., & Röder, B. (2026). Individuals born with congenital cataracts exhibit both persisting impairment and considerable recovery of white matter microstructure after sight restoration. *Aperture Neuro*, 6. <https://doi.org/10.52294/001c.158797>
- P38. Sourav, S., Feucht, M.E., Kekunnaya, R., & Röder, B. (2026). The temporal stability of visual cortical processing in humans depends on early experience. *Journal of Neurophysiology*, 135(4), 983-1001. <https://doi.org/10.1152/jn.00343.2025>
- P37. Ossandón, J.P., Rossion, B., Dormal, G., Kekunnaya, R., & Röder, B. (2025). Impaired rapid neural face categorization after reversing long-lasting congenital blindness. *Cortex*, 187, 124-139. <https://doi.org/10.1016/j.cortex.2025.04.007>
- P36. Pant, R., Pitchaimuthu, K., Ossandon, J., Shareef, I., Lingareddy, S., Finsterbusch, J., Kekunnaya, R., & Röder, B. (2025). Altered visual cortex excitatory/inhibitory ratio following transient congenital visual deprivation in humans. *eLife*, 13, RP98143. <https://doi.org/10.7554/eLife.98143>
- P35. Racz, K., Linke, M., van den Hurk, J., Heitmann, C., Guerreiro, M.J.S., Zhan, M., Kekunnaya, R., Goebel, R., & Röder, B. (2025). Visual and auditory object representations in ventral visual cortex after restoring sight in humans. *Human Brain Mapping*, 46(12), e70316. <https://doi.org/10.1002/hbm.70316>
- P34. Hötting, K., Shareef, I., Rogge, A.-K., Hamacher, D., Zech, A., Kekunnaya, R., Christy, B., Röder, B. (2024). Postural control depends on early visual experience. *Journal of Vision*, 24(9), 3. <https://doi.org/10.1167/jov.24.9.3>
- P33. Sourav, S., Kekunnaya, R., Bottari, D., Shareef, I., Pitchaimuthu, K., Röder, B. (2024). Sound suppresses earliest visual cortical processing after sight recovery in congenitally blind humans. *Communications Biology*, 7(1), 118. <https://doi.org/10.1038/s42003-023-05749-3>
- P32. Heitmann, C., Zhan, M., Linke, M., Hölig, C., Kekunnaya, R., van Hoof, R., Goebel, R., & Röder, B. (2023). Early visual experience refines the retinotopic organization within and across visual cortical regions. *Current Biology*, 33(22), 4950-4959.e4. <https://doi.org/10.1016/j.cub.2023.10.010>
- P31. Hölig, C., Guerreiro, M.J.S., Lingareddy, S., Kekunnaya, R., & Röder, B. (2023). Sight restoration in congenitally blind humans does not restore visual brain structure. *Cerebral Cortex*, 33(5), 2152-2161. <https://doi.org/10.1093/cercor/bhac197>
- P30. Ossandón, J. P., Stange, L., Gudi-Mindermann, H., Rimmele, J. M., Sourav, S., Bottari, D., Kekunnaya, R., & Röder, B. (2023). The development of oscillatory and aperiodic resting state activity is linked to a sensitive period in humans. *NeuroImage*, 275, 120171. <https://doi.org/10.1016/j.neuroimage.2023.120171>

- P29. Pant, R., Ossandón, J.P., Stange, L., Shareef, I., Kekunnaya, R., & Röder, B. (2023). Stimulus-evoked and resting-state alpha oscillations show a linked dependence on patterned visual experience for development. **NeuroImage: Clinical**, 38, 103375. <https://doi.org/10.1016/j.nicl.2023.103375>
- P28. Bruns, P., Li, L., Guerreiro, M.J.S., Shareef, I., Rajendran, S.S., Pitchaimuthu, K., Kekunnaya, R., & Röder, B. (2022). Audiovisual spatial recalibration but not integration is shaped by early sensory experience. **iScience** 25(6), 104439. <https://doi.org/10.1016/j.isci.2022.104439>
- P27. Guerreiro, M., Kekunnaya, R., & Röder, B. (2022). Top-down modulation of visual cortical processing after transient congenital blindness. **Neuropsychologia**, 174, 108338. <https://doi.org/10.1016/j.neuropsychologia.2022.108338>
- P26. Ossandón, J., Zerr, P., Shareef, I., Kekunnaya, R., & Röder, B. (2022). Active vision in sight recovery individuals with a history of long-lasting congenital blindness. **eNeuro**, 9(5). <https://doi.org/10.1523/ENEURO.0051-22.2022>
- P25. Raczy, K., Hölig, C., Guerreiro M.J.S., Lingareddy, S., Kekunnaya, R., & Röder, B. (2022). Typical resting-state activity of the brain requires visual input during an early sensitive period. **Brain Communications**, 4(4), fcac146. <https://doi.org/10.1093/braincomms/fcac146>
- P24. Guerreiro, M., Linke, M., Lingareddy, S., Kekunnaya, R., & Röder, B. (2021). The effect of congenital blindness on resting-state functional connectivity revisited. **Scientific Reports**, 11(1), 12433. <https://doi.org/10.1038/s41598-021-91976-9>
- P23. Pant, R., Guerreiro, M.J.S., Ley, P., Bottari, D., Shareef, I., Kekunnaya, R., & Röder, B. (2021). The size-weight illusion is unimpaired in individuals with history of congenital visual deprivation. **Scientific Reports**, 11(1), 6693. <https://doi.org/10.1038/s41598-021-86227-w>
- P22. Pitchaimuthu, K., Dormal, G., Sourav, S., Shareef, I., Rajendran, S.S., Ossandón, J.P., Kekunnaya, R., & Röder, B. (2021). Steady state evoked potentials indicate changes in nonlinear neural mechanisms of vision in sight recovery individuals. **Cortex**, 144, 15-28. <https://doi.org/10.1016/j.cortex.2021.08.001>
- P21. Röder, B., & Kekunnaya, R. (2021). Visual experience dependent plasticity in humans. **Current Opinion in Neurobiology**, 67, 155-162. <https://doi.org/10.1016/j.conb.2020.11.011>
- P20. Röder, B., Kekunnaya, R., & Guerreiro, M.J.S. (2021). Neural mechanisms of visual sensitive periods in humans. **Neuroscience and Biobehavioral Reviews**, 120, 86-99. <https://doi.org/10.1016/j.neubiorev.2020.10.030>
- P19. Badde, S., Ley, P., Rajendran, S.S., Shareef, I., Kekunnaya, R., & Röder, B. (2020). Sensory experience during early sensitive periods shapes cross-modal temporal biases. **eLife**, 9, e61238. <https://doi.org/10.7554/eLife.61238>
- P18. Rajendran, S.S., Bottari, D., Shareef, I., Pitchaimuthu, K., Sourav, S., Troje, N.F., Kekunnaya, R., & Röder, B. (2020). Biological action identification does not require early visual input for development. **eNeuro**, 7(5). <https://doi.org/10.1523/ENEURO.0534-19.2020>

- P17. Sourav, S., Bottari, D., Shareef, I., Kekunnaya, R., & Röder, B. (2020). An electrophysiological biomarker for the classification of cataract-reversal patients: A case-control study. *EClinicalMedicine*, 27, 100559. <https://doi.org/10.1016/j.eclinm.2020.100559>
- P16. Zerr P., Ossandón, J.P., Shareef, I., Van der Stigchel, S., Kekunnaya, R., & Röder, B. (2020). Successful visually guided eye movements following sight restoration after congenital cataracts. *Journal of Vision*, 20(7), 3. [*equal contribution]. <https://doi.org/10.1167/jov.20.7.3>
- P15. Pitchaimuthu, K., Sourav, S., Bottari, D., Banerjee, S., Shareef, I., Kekunnaya, R., & Röder, B. (2019). Color vision in sight recovery individuals. *Restorative Neurology and Neuroscience*, 37(6), 583-590. <https://doi.org/10.3233/RNN-190928>
- P14. Sourav, S., Kekunnaya, R., Shareef, I., Banerjee, S., Bottari, D., & Röder, B. (2019). A protracted sensitive period regulates the development of cross-modal sound-shape associations in humans. *Psychological Science*, 30(10), 1473-1482. <https://doi.org/10.1177/0956797619866625>
- P13. Bottari, D., Kekunnaya, R., Hense, M., Troje, N.F., Sourav, S., & Röder, B. (2018). Motion processing after sight restoration: No competition between visual recovery and auditory compensation. *Neuroimage*, 167, 284-296. <https://doi.org/10.1016/j.neuroimage.2017.11.050>
- P12. Sourav, S., Bottari, D., Kekunnaya, R., & Röder, B. (2018). Evidence of a retinotopic organization of early visual cortex but impaired extrastriate processing in sight recovery individuals. *Journal of Vision*, 18(3), 22. <https://doi.org/10.1167/18.3.22>
- P11. Bottari, D., Troje, N.F., Ley, P., Hense, M., Kekunnaya, R., & Röder, B. (2016). Sight restoration after congenital blindness does not reinstate alpha oscillatory activity in humans. *Scientific Reports*, 6, 24683. <https://doi.org/10.1038/srep24683>
- *P10. Guerreiro, M., Putzar, L., & Röder, B. (2016). Persisting cross-modal changes in sight-recovery individuals modulate visual perception. *Current Biology*, 26(22), 3096-3100. <https://doi.org/10.1016/j.cub.2016.08.069>
- P9. Bottari, D., Troje, N.F., Ley, P., Hense, M., Kekunnaya, R., & Röder, B. (2015). The neural development of the biological motion processing system does not rely on early visual input. *Cortex*, 71, 359-367. <https://doi.org/10.1016/j.cortex.2015.07.029>
- *P8. Guerreiro, M., Putzar, L., & Röder, B. (2015). The effect of early visual deprivation on the neural bases of multisensory processing. *Brain*, 138(6), 1499-1504. <https://doi.org/10.1093/brain/awv076>
- P7. Ley, P., Bottari, D., Shenoy, B.H., Kekunnaya, R., & Röder, B. (2013). Partial recovery of visual-spatial remapping of touch after restoring vision in a congenitally blind man. *Neuropsychologia*, 51(6), 1119-1123. <https://doi.org/10.1016/j.neuropsychologia.2013.03.004>
- P6. Röder, B., Ley, P., Shenoy, B.H., Kekunnaya, R., & Bottari, D. (2013). Sensitive periods for the functional specialization of the neural system for human face processing. *Proceedings of the National Academy of Sciences of the United States of America*, 110(42), 16760-16765. <https://doi.org/10.1073/pnas.1309963110>

- *P5. Putzar, L., Gondan, M., & Röder, B. (2012). Basic multisensory functions can be acquired after congenital visual pattern deprivation in humans. *Developmental Neuropsychology*, 37(8), 697-711. <https://doi.org/10.1080/87565641.2012.696756>
 - *P4. Putzar, L., Goerendt, I., Heed, T., Richard, G., Büchel, C., & Röder, B. (2010). The neural basis of lip-reading capabilities is altered by early visual deprivation. *Neuropsychologia*, 48(7), 2158-2166. <https://doi.org/10.1016/j.neuropsychologia.2010.04.007>
 - *P3. Putzar, L., Hötting, K., & Röder, B. (2010). Early visual deprivation affects the development of facerecognition and of audio-visual speech perception. *Restorative Neurology and Neuroscience*, 28(2), 251-257. <https://doi.org/10.3233/RNN-2010-0526>
 - *P2. Putzar, L., Goerendt, I., Lange, K., Rösler, F., & Röder, B. (2007). Early visual deprivation impairs multisensory interactions in humans. *Nature Neuroscience*, 10(10), 1243-1245. <https://doi.org/10.1038/nn1978>
 - *P1. Putzar, L., Hötting, K., Rösler, F., & Röder, B. (2007). The development of visual feature binding processes after visual deprivation in early infancy. *Vision Research*, 47(20), 2616-2626. <https://doi.org/10.1016/j.visres.2007.07.002>
- * publications of the Biological and Neuropsychology lab prior collaborating with the LVPEI.

Book Chapters

- BC1. Röder, B., Kekunnaya, R. (2022). Effects of early deprivation. In: *Oxford Research Encyclopedia of Psychology*. Oxford: University Press. <https://doi.org/10.1093/acrefore/9780190236557.013.839>

Events jointly organized in India

INSA-Leopoldina Symposium “The challenge to learn: New approaches to study the problem of stability vs. plasticity in the brain”, Hyderabad (India), November 28-29, 2017 (together with D. Balasubramanian, Jozsef Fiser, Neeraj Jain).

INSA-Leopoldina Symposium “Brain and Eye”, in Hyderabad (India), February 1-2, 2016 (together with D. Balasubramanian).

Talks of Brigitte Röder in India

University of Hyderabad, School of Medical Sciences (Hyderabad, India): “Cognitive Neuroscience approaches to understand human brain development”, February 24, 2026.

L V Prasad Eye Institute, Eye and Brain Health Symposium (Hyderabad, India): “Indo-German Eye and Brain Lab”, February 2, 2026.

Conference on Cognitive Science and Human Development: A Transdisciplinary International Conclave (ACCL) (University of Hyderabad, India): “The role of visual experience for the development of active vision and underlying neural representations”, February 12-14, 2024.

Indian Institute of Technology (Gandhinagar, India): How research in sight restoration helps us understanding human brain development. February 14, 2023.

Champalimaud Research Symposium Hyderabad (India) (online lecture): “How neuroscience helps to understand functional recovery after congenital cataract surgery”. January 31, 2021.

L V Prasad Eye Institute Eleventh Annual Champalimaud Symposium (Hyderabad, India): Keynote “The neural basis of sight recovery after cataract surgery”, January 28, 2018.

L V Prasad Eye Institute (Hyderabad, India): “Neuroplasticity”, January 17, 2018.

Indian Institute for Science, Education and Research (Kolkata, India): “Early experience leaves permanent traces in the human brain”, January 5, 2018.

Brain Modes (Manesar, India): “Experience and age dependent development of neural representation”, December 13, 2017.

XXXIV Annual Meeting of Indian Academy of Neurosciences (Manesar, India): Special Lecture “Experience-dependent development of (multi)sensory functions”, October 20, 2016.

Leibniz-Lecture in Hyderabad (Hyderabad, India): “Sensitive phases in human brain development”, February 3, 2016.

German House for Research and Innovation (New Delhi, India): First Leopoldina-Leibniz Lecture “Age-dependent learning plasticity in humans”, January 21, 2015.

National Brain Research Center (New Delhi, India): “Multisensory processing and neuroplasticity”, January 20, 2015.

ISSA (Pune, India): “The role of experience in brain development”. January 15, 2015.

Public Outreach (examples)

The “*Times of India*” reports in their article “Vision must for infant brain to develop face recognition skills” from November 27, 2025, about the results of a study conducted by the Indo-German Lab at the L V Prasad Eye Institute in Hyderabad, India, which was published by Rączy et al. in 2025 in **Human Brain Mapping** (see <https://www.psy.uni-hamburg.de/arbeitsbereiche/biologische-psychologie-und-neuropsychologie/news/uploads-dateien/20271127-times-of-india-vision-must-for-infant-brain-to-develop-face-recognition-skills.pdf>)

Fascinating Brain – Brigitte Röder and Her Research on Neuroplasticity. Film by the Hector Fellow Academy. Published on YouTube, 22.02.2024. <https://www.youtube-nocookie.com/embed/cfvwOoVsnUc?rel=0>

Why Do Children and Adults learn differently? Annual Symposium of the Hector Fellow Academy (Hamburg, Germany), July 11, 2024. Film by the Hector Fellow Academy. Published on YouTube, 16.07.2024. <https://www.youtube-nocookie.com/embed/ofR2VaTYYt4?rel=0>

International neuroscience research. Can People Born Blind Learn to See? Interview with Brigitte Röder by Anna Priebe. Newsroom of the University of Hamburg, Doing the Research series

38, 04.12.2024. <https://www.uni-hamburg.de/en/newsroom/forschung/2024/1203-fv-38-pb-gehirnforschung.html>

Hölig, C., Kekunnaya, R., Röder, B. (2023, May 12). *Adversity in early childhood can impair brain development*. **Scientific American**. <https://www.scientificamerican.com/article/adversity-in-early-childhood-can-irreversibly-impair-the-brain/>