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CURRICULUM VITAE

Jeffrey Robert Binder, M.D.
Professor of Neurology

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Birth Place: Chicago, IL, U.S.A

Education:

1976-1980 B.A., 1980; University of Nebraska, Lincoln, NE
1980-1981 Graduate Studies; Michigan State University, East Lansing, MI
1982-1986 M.D., 1986; University of Nebraska Medical Center, Omaha, NE

Postgraduate Training and Fellowship Appointments:

1986-1987 Resident, Internal Medicine; Northwestern University, Chicago, IL;
R. Patterson, M.D., Director
1987-1990 Resident, Neurology; The Neurological Institute of New York,
Presbyterian Hospital, New York, NY; Lewis P. Rowland, M.D., Director
1990-1992 Fellow, Stroke and Behavioral Neurology; The Neurological Institute of
New York, Presbyterian Hospital; New York, NY; J. P. Mohr, M.D.,
Director

Faculty Appointments:

1990-1992 Assistant in Clinical Neurology; Presbyterian Hospital; New York, NY
1992-1996 Assistant Professor, Department of Neurology; The Medical College of
Wisconsin; Milwaukee, WI
1996-2002 Associate Professor, Department of Neurology; The Medical College of
Wisconsin; Milwaukee, WI
1996-present Associate Professor, Department of Cellular Biology, Neurobiology and
Anatomy; The Medical College of Wisconsin; Milwaukee, WI
2002-present Professor, Department of Neurology; The Medical College of Wisconsin;
Milwaukee, WI
2003-present Adjunct Professor, Department of Psychology, University of Wisconsin,
Madison, WI

Awards and Honors:

1980 Graduation with High Distinction, University of Nebraska
1980 Phi Beta Kappa
1983 Regents Scholarship, University of Nebraska Medical Center
1985 Michaelson Student Research Grant, University of Nebraska Medical Center
1985 Alpha Omega Alpha Medical Honor Society

Specialty Boards and Certification Boards:

American Board of Psychiatry and Neurology 10/1991

Membership in Professional Societies:

1987-present American Academy of Neurology
1993-present American Association for the Advancement of Science
1995-present Society for Neuroscience
1996-present World Federation of Neurology, Research Group on Aphasia and Cognitive Disorders
1997-present Cognitive Neuroscience Society

Editorial Boards:

1997-present Neuroscience News
1999-present Epilepsy and Behavior

National Committee Positions:

2000-present Member, NIH Study Section on Integrative and Functional Cognitive Neuroscience (IFCN-8); S. Schiff, Chair

Current Research Grants and Contracts:

Title: Presurgical Applications of Functional MRI in Epilepsy
Source: NINDS – R01 NS35929
Role: Principal Investigator
Dates: 09/01/97 - 08/31/03
Direct Funds: \$786,308

Title: Functional Magnetic Resonance Imaging of the Brain (Hyde, PI)
Source: NIMH – P01 MH51358
Role: Co-Investigator and Project Leader
Dates: 04/01/95 - 03/31/04
Direct Funds: \$5,882,901

Title: Functional MRI of Human Brain Language Systems
Source: NINDS – R01 NS33576
Role: Principal Investigator
Dates: 12/01/94 - 08/31/05
Direct Funds: \$1,250,000

Title: Neurophysiology of Speech Perception (Liebenthal, PI)
Source: NIDCD – R01 DC006287
Role: Co-Investigator
Dates: 07/01/03 - 06/30/08
Direct Funds: \$1,250,000

Title: Structural and Functional Neuroanatomy of Language Laterality (Eckert, PI)
Source: NSF –
Role: Co-Investigator
Dates: 03/01/03-02/28/05
Direct Funds:

Medical College of Wisconsin Administrative Positions:

1992-present Director, Stroke and Neurobehavior Programs, Department of Neurology
1994-1999 Director, Froedtert and Medical College Stroke Center
1994-present Director, Language Imaging Laboratory, Department of Neurology

Medical College of Wisconsin Committees:

1995-present	Project and Core Leaders Committee, Program Project on Functional MRI of the Brain
1996-present	Research Committee, Department of Neurology
2001-present	MCW Neuroscience Research Initiative Committee

PUBLICATIONS

A. Original Peer Reviewed Articles:

1. Sun SF, **Binder JR**, Streib E, Goodlin RC. Myotonic dystrophy: Obstetric and neonatal complications. *Southern Medical Journal*, 1985; 787: 823-26.
2. Chamorro A, Sacco RL, Ciecierski K, **Binder JR**, Tatemichi TK, Mohr JP. Visual hemineglect and hemihallucinations in a patient with subcortical infarction. *Neurology*, 1990; 40: 1463-64.
3. **Binder JR**, Lazar RM, Tatemichi TK, Mohr JP, Desmond DW, Ciecierski KA. Left hemiparalexia. *Neurology*, 1992; 42: 562-569.
4. **Binder JR**, Marshall RS, Lazar RM, Benjamin JL, Mohr JP. Distinct syndromes of hemineglect. *Archives of Neurology*, 1992; 49: 1187-1194.
5. **Binder JR**, Mohr JP. The topography of callosal reading pathways: A case-control analysis. *Brain*, 1992; 115: 1807-1826.
6. Rao SM, **Binder JR**, Bandettini PA, Hammeke TA, Yetkin FZ, Jesmanowicz A, Lisk LM, Morris GL, Mueller WM, Estkowski LD, Wong EC, Haughton VM, Hyde JS. Functional magnetic resonance imaging of complex human movements. *Neurology*, 1993, 43: 2311-2318.
7. **Binder JR**, Rao SM, Hammeke TA, Yetkin FZ, Jesmanowicz A, Bandettini PA, Wong EC, Estkowski LD, Goldstein MD, Haughton VM, Hyde JS. Functional magnetic resonance imaging of human auditory cortex. *Annals of Neurology*, 1994; 35: 662-672.
8. **Binder JR**, Rao SM, Hammeke TA, Bandettini PA, Frost JA, Hyde JS. Effects of stimulus rate on signal response during functional magnetic resonance imaging of auditory cortex. *Cognitive Brain Research*, 1994; 2: 31-38.
9. Marshall RS, Lazar RM, **Binder JR**, Desmond DW, Drucker PM, Mohr JP. Intrahemispheric localization of drawing dysfunction. *Neuropsychologia*, 1994; 32: 493-501.
10. Hammeke TA, Yetkin FZ, Mueller WM, Morris GL, Haughton VM, Rao SM, **Binder JR**. Functional magnetic resonance imaging of somatosensory stimulation. *Neurosurgery*. 1994; 35: 677-681.
11. **Binder JR**, Rao SM, Hammeke TA, Frost JA, Bandettini PA, Jesmanowicz A, Hyde JS. Lateralized human brain language systems demonstrated with task subtraction functional magnetic resonance imaging. *Archives of Neurology*, 1995; 52: 593-601.
12. Rao SM, **Binder JR**, Hammeke TA, Bandettini PA, Bobholz JA, Frost JA, Myklebust BM, Jacobson RD, Hyde JS. Somatotopic mapping of the human primary motor cortex with functional magnetic resonance imaging. *Neurology*, 1995; 45: 919-924.
13. **Binder JR**, Swanson SJ, Hammeke TA, Morris GL, Mueller WM, Fischer M, Benbadis S, Frost JA, Rao SM, Haughton VM. Determination of language dominance using functional magnetic resonance imaging: A comparison with the Wada test. *Neurology*, 1996; 46: 978-984.
14. Rao SM, Bandettini PA, **Binder JR**, Bobholz JA, Hammeke TA, Stein EA, Hyde JS. Relationship between movement rate and functional magnetic resonance signal change in human primary motor cortex. *Journal of Cerebral Blood Flow and Metabolism*, 1996; 16: 1250-1254.
15. **Binder JR**, Frost JA, Hammeke TA, Rao SM, Cox RW. Function of the left planum temporale in auditory and linguistic processing. *Brain*, 1996; 119: 1239-1247.
16. **Binder JR**, Frost JA, Hammeke TA, Cox RW, Rao SM, Prieto T. Human brain language areas identified by functional magnetic resonance imaging. *Journal of Neuroscience*, 1997; 17: 353-362.

17. Rao SM, Bobholz JA, Hammeke TA, Rosen AC, Woodley SJ, Cunningham JM, Cox RW, Stein EA, **Binder JR**. Functional MRI evidence for subcortical participation in conceptual reasoning skills. *Neuroreport*, 1997; 8: 1987-1993.
18. Rao SM, Harrington DL, Haaland KY, Bobholz JA, Cox RW, **Binder JR**. Distributed neural systems underlying the timing of movements. *Journal of Neuroscience*, 1997; 17: 5528-5535.
19. Arnett PA, Rao SM, Bernardin L, Luchetta T, **Binder JR**, Lobeck L. Executive functions in multiple sclerosis: an analysis of temporal ordering, semantic encoding, and planning abilities. *Neuropsychology*, 1997; 11: 535-544.
20. Bellgowan PSF, **Binder JR**, Swanson SJ, Hammeke TA, Springer JA, Frost JA, Mueller WM, Morris GL. Side of seizure focus determines left medial temporal lobe activation during verbal encoding. *Neurology*, 1998; 51: 479-484.
21. Benbadis SR, **Binder JR**, Swanson SJ, Fischer M, Hammeke TA, Morris GL, Frost JA, Springer JA. Is speech arrest during Wada testing a valid method for determining hemispheric representation of language? *Brain and Language*, 1998; 65: 441-446.
22. **Binder JR**, Frost JA, Hammeke TA, Bellgowan PSF, Rao SM, Cox RW. Conceptual processing during the conscious resting state: a functional MRI study. *Journal of Cognitive Neuroscience*, 1999; 11: 80-93.
23. Rosen AC, Rao SM, Caffarra P, Scaglioni A, Bobholz JA, Woodley SJ, Hammeke TA, Cunningham JM, **Binder JR**. Neural basis of endogenous and exogenous spatial orienting: a functional MRI study. *Journal of Cognitive Neuroscience*, 1999; 11: 135-152.
24. Frost JA, **Binder JR**, Springer JA, Hammeke TA, Bellgowan PSF, Rao SM, Cox RW. Language processing is strongly left lateralized in both sexes: Evidence from FMRI. *Brain*, 1999; 122: 199-208.
25. Crosson B, Rao SM, Woodley SJ, Rosen AC, Hammeke TA, Bobholz JA, Mayer A, Cunningham JM, Fuller SA, **Binder JR**, Cox RW, Stein EA. Mapping of semantic, phonological, and orthographic verbal working memory in normal adults with FMRI. *Neuropsychology*, 1999; 13: 171-187.
26. Tanne D, Bates VE, Verro P, Kasner SE, **Binder JR**, Patel SC, Mansbach HH, Daley S, Schultz LR, Karanjia PN, Scott P, Dayno JM, Vereczkey-Porter K, Benesch C, Book D, Coplin WM, Dulli D, Levine SR, et al. Initial clinical experience with IV tissue plasminogen activator for acute ischemic stroke: A multicenter survey. *Neurology*, 1999; 53: 424-427.
27. Springer JA, **Binder JR**, Hammeke TA, Swanson SJ, Frost JA, Bellgowan PS, Brewer CC, Perry HM, Morris GL, Mueller WM. Language dominance in neurologically normal and epilepsy subjects: a functional MRI study. *Brain*, 1999; 122: 2033-2045.
28. Leveroni CL, Seidenberg M, Mayer AR, Mead LA, **Binder JR**, Rao SM. Neural systems underlying the recognition of familiar and newly learned faces. *Journal of Neuroscience*, 2000; 20: 878-886.
29. Tanne D, Gorman MJ, Bates VE, Kasner SE, Scott P, Verro P, **Binder JR**, Dayno JM, Schultz LR, Levine SR, et al. Intravenous tissue plasminogen activator for acute ischemic stroke in patients aged 80 years and older. The tPA stroke survey experience. *Stroke*, 2000; 31: 370-375.
30. Harrington DL, Rao SM, Haaland KY, Bobholz JA, Mayer AR, **Binder JR**, Cox RW. Specialized neural systems underlying representations of sequential movements. *Journal of Cognitive Neuroscience*, 2000; 12: 56-77.
31. **Binder JR**, Frost JA, Hammeke TA, Bellgowan PSF, Springer JA, Kaufman JN, Possing ET. Human temporal lobe activation by speech and nonspeech sounds. *Cerebral Cortex*, 2000; 10: 512-528.
32. Alsaadi T, **Binder JR**, Lazar RM, Doorani T, Mohr JP. Pure topographical disorientation: A distinctive syndrome with varied localization. *Neurology*, 2000; 54: 1864-1866.
33. Demchuk AM, Tanne D, Hill MD, Kasner SE, Hanson S, Grond M, Levine SR, and the Multicenter tPA Stroke Survey Group. Predictors of good outcome after intravenous tPA for acute ischemic stroke: The multi-centre tPA acute stroke survey. *Neurology*, 2001; 57: 474-480.

34. Mohr JP, Thompson JLP, Lazar RM, Levin B, Sacco RL, Furie KL, Kistler JP, Albers GW, Pettigrew LC, Adams HP, Jackson CM, Pullicino P, and the Warfarin-Aspirin Recurrent Stroke Study Group. A comparison of warfarin and aspirin for the prevention of recurrent ischemic stroke. *New England Journal of Medicine*, 2001; 345: 1444-1451.
35. Szaflarski JP, **Binder JR**, Possing ET, McKiernan KA, Ward BD, Hammeke TA. Language lateralization in left-handed and ambidextrous people: fMRI data. *Neurology*, 2002; 59: 238-244.
36. **Binder JR**, McKiernan KA, Parsons M, Westbury CF, Possing ET, Kaufman JN, Buchanan L. Neural correlates of lexical access during visual word recognition. *Journal of Cognitive Neuroscience*, 2003; 15: 372-393.
37. McKiernan KA, Kaufman JN, Kucera-Thompson J, **Binder JR**. A parametric manipulation of factors affecting task-induced deactivation in functional neuroimaging. *Journal of Cognitive Neuroscience*, 2003; 15: 394-408.
38. Liebenthal E, **Binder JR**, Piorkowski RL, Remez RE. Short-term reorganization of auditory cortex induced by phonetic experience. *Journal of Cognitive Neuroscience*, 2003; 15: 549-558.
39. Sabsevitz DS, Swanson SJ, Hammeke TA, Spanaki MV, Possing ET, Morris GL, Mueller WM, **Binder JR**. Prediction of language deficits resulting from left anterior temporal lobectomy using preoperative functional neuroimaging. *Neurology*, 2003; 60: 1788-1792.
40. Liebenthal E, Ellingson ML, Spanaki MV, Prieto TE, Ropella KM, **Binder JR**. Simultaneous ERP and fMRI of the auditory cortex in a passive oddball paradigm. *Neuroimage*, in press.

B. Book Chapters and Reviews:

1. **Binder JR**, Rao SM. Brain mapping with functional magnetic resonance imaging. In: *Localization and Neuroimaging in Neuropsychology*, Kertesz A, ed. Orlando, Academic Press, 1994, p.185-212.
2. **Binder JR**. Functional magnetic resonance imaging of language cortex. *International Journal of Imaging Systems and Technology*, 1995; 6: 280-288.
3. Bandettini PA, Wong EC, **Binder JR**, Rao SM, Jesmanowicz A, Aaron E, Lowry T, Forster H, Hinks RS, Hyde JS. Functional MRI using the BOLD approach: Dynamics and data analysis techniques. In: *Perfusion and Diffusion: Magnetic Resonance Imaging*, LeBihan D, Rosen B, eds. New York, Raven Press, 1995, p.335-349.
4. Bandettini PA, **Binder JR**, DeYoe EA, Rao SM, Hammeke TA, Jesmanowicz A, Wong EC, Haughton VM, Hyde JS. Functional MRI using the BOLD approach: Applications. In: *Perfusion and Diffusion: Magnetic Resonance Imaging*, LeBihan D, Rosen B, eds. New York, Raven Press, 1995, p.351-362.
5. Bandettini PA, **Binder JR**, DeYoe EA, Hyde JS. Brain: Sensory activation-induced hemodynamic changes observed in the human brain with echo planar MRI. In: *Encyclopedia of NMR, Vol. 1*, Grant DM, Harris RK, eds. New York; John Wiley & Sons, 1996, p. 1051-1056.
6. **Binder JR**. Neuroanatomy of language processing studied with functional MRI. *Clinical Neuroscience*, 1997; 4: 87-94.
7. **Binder JR**. Functional magnetic resonance imaging: Language mapping. *Neurosurgery Clinics of North America*, 1997; 8: 383-392.
8. **Binder JR**, Frost JA. Functional MRI studies of language processes in the brain. *Neuroscience News*, 1998; 1: 15-23.
9. Jaradeh S, Braun T, Maas E, Lobeck L, Antuono P, **Binder J**, Terry LC. Neurologic disorders. In: *Kochar's Concise Textbook of Medicine, 3rd Edition*. Baltimore, MD; Williams and Wilkins, 1998.
10. **Binder JR**. Functional MRI of the language system. In: *Functional MRI*, Moonen CTW, Bandettini PA, eds. Berlin, Springer-Verlag, 1999, p.407-419.

11. Zatorre RR, **Binder JR**. Functional and structural imaging of the human auditory system. In: *Brain Mapping: The Systems*, Toga AW, Mazziotta JC, eds. San Diego, CA; Academic Press, 2000, p. 365-402.
12. Hammeke TA, Bellgowan PSF, **Binder JR**. fMRI: Methodology: Cognitive function mapping. In: *Functional Imaging in the Epilepsies, Advances in Neurology*, 83; Henry TR, Duncan JS, Berkovic SF, eds. Philadelphia; Lippincott Williams & Wilkins, 2000, p.221-233.
13. **Binder JR**, Price C. Functional imaging of language. In: *Handbook of Functional Neuroimaging of Cognition*, Cabeza R, Kingstone A, eds. Cambridge, MA; MIT Press, 2001, p. 187-251.
14. **Binder JR**. The Wernicke-Lichtheim model of language processing. In: *The Corsini Encyclopedia of Psychology and Behavioral Science, Third Edition, Vol. 4*, Craighead WE, Nemeroff CB, eds. New York, John Wiley & Sons, 2001, p. 1760-1763.
15. **Binder JR**, Achten E, Constable RT, Detre JA, Gaillard WD, Jack CR, Loring DW. Functional MRI in epilepsy. *Epilepsia*, 2002; 43 (Suppl 1): 51-63.
16. **Binder JR**. Wernicke aphasia: A disorder of central language processing. In: *Neurological Foundations of Cognitive Neuroscience*, D'Esposito ME, ed. MIT Press, Cambridge MA, 2002, p.175-238.
17. **Binder JR**, Mohr JP. Posterior cerebral artery disease. In: *Stroke. Pathophysiology, Diagnosis, and Management, 4th Edition*, Barnett HJM, Mohr JP, Stein BM, Yatsu FM, eds. Churchill Livingstone, New York, in press.
18. Hammeke TA, Mueller WM, Swanson SJ, **Binder JR**. Functional MRI in epilepsy surgery. In: *Yomans Neurological Surgery, 5th edition*, Winn HR, ed. W.B. Saunders Company, Philadelphia, PA, in press.

C. Editorials, Letters, and Brief Communications:

1. **Binder JR**, Lazar RM, Tatemichi TK, Mohr JP, Desmond DW, Ciecierski KA. Left hemiparalexia. *Neurology*, 1993; 43: 1057-1058.
2. **Binder JR**, Frost JA, Hammeke TA, Springer JA, Bellgowan PSF, Rao SM, Cox RW. Language processing in both sexes: evidence from brain studies (Reply to J. Harasty). *Brain*, 2000; 123:405-406.
3. **Binder JR**. The new neuroanatomy of speech perception (Editorial). *Brain*, 2000; 123: 2371-2372.
4. **Binder JR**. Letter to the Editor re: Loring et al. "Now you see it now you don't". *Epilepsy & Behavior*, in press.

D. Selected Peer Reviewed Abstracts Presented and Published:

1. **Binder JR**, Mohr JP, Khandji A, Tatemichi TK. Lesion size correlates with severity in pure alexia: Evidence against strict localization. *Neurology*, 1989; 39 (Suppl 1): 223.
2. **Binder JR**, Mohr JP, Khandji A, Tatemichi TK. CT correlates of color dysnomia. *Neurology*, 1989; 39 (Suppl 1): 226.
3. **Binder JR**, Lazar RM, Tatemichi TK, Mohr JP, Desmond DW, Ciecierski KA. Left hemiparalexia. *Neurology*, 1991; 41 (Suppl 1): 409.
4. Marshall R, **Binder JR**, Lazar RM, Benjamin JL, Mohr JP. Distinct syndromes of hemineglect. *Annals of Neurology*, 1991;30:239.
5. **Binder JR**, Lazar RM, Marshall RS, Mohr JP. Quadrantic neglect. *Neurology*, 1992; 42 (Suppl 3):224.
6. Lazar RM, **Binder JR**, Benjamin JL, Mohr JP. The measurement of hemineglect in aphasic patients. *Neurology*, 1992; 42 (Suppl 3):222.
7. Marshall R, **Binder JR**, Lazar RM, Benjamin JL, Mohr JP. The effect of lesion size and location on hemineglect. *Neurology*, 1992; 42 (Suppl 3):223.
8. **Binder JR**, Rao SM, Hammeke TA, Yetkin FZ, Wong EC, Mueller WM, Morris GL, Hyde JS. Functional magnetic resonance imaging (fMRI) of auditory semantic processing. *Neurology*, 1993; 43 (Suppl 2): A189.

9. Rao SM, **Binder JR**, Hammeke TA, Yetkin FZ, Bandettini PA, Morris GL, Mueller WM, Antuono PG, Wong EC, Haughton VM, Hyde JS. Somatotopic organization of primary motor cortex demonstrated by functional magnetic resonance imaging (fMRI). *Neurology*, 1993; 43 (Suppl 2): A188.
10. Bandettini PA, Wong EC, DeYoe EA, **Binder JR**, Hinks RS, Hyde JS. Fourier analysis of functional EPI time-course series. *Journal of Magnetic Resonance Imaging*, 1993; 3(P): 89.
11. Bandettini PA, Rao SM, **Binder JR**, Hammeke TA, Jesmanowicz A, Yetkin FZ, Bates S, Estkowski LD, Wong EC, Haughton VM, Hinks RS, Hyde JS. Magnetic resonance functional neuroimaging of the entire brain during performance and mental rehearsal of complex finger movement tasks. *Proceedings of the Society for Magnetic Resonance in Medicine*, 1993; 3: 1396.
12. Bandettini PA, Wong EC, DeYoe EA, **Binder JR**, Rao SM, Birzer D, Estkowski LD, Jesmanowicz A, Hinks RS, Hyde JS. The functional dynamics of blood oxygen level dependent contrast in the motor cortex. *Proceedings of the Society for Magnetic Resonance in Medicine*, 1993; 3: 1382.
13. **Binder JR**, Rao SM, Hammeke TA, Bandettini PA, Jesmanowicz A, Frost JA, Wong EC, Haughton VM, Hyde JS. Temporal characteristics of functional magnetic resonance signal change in lateral frontal and auditory cortex. *Proceedings of the Society for Magnetic Resonance in Medicine*, 1993; 1: 5.
14. **Binder JR**, Jesmanowicz A, Rao SM, Bandettini PA, Hammeke TA, Hyde JS. Analysis of phase differences in periodic functional MRI activation data. *Proceedings of the Society for Magnetic Resonance in Medicine*, 1993; 3: 1383.
15. Rao SM, **Binder JR**, Hammeke TA, Lisk LM, Bandettini PA, Yetkin FZ, Morris GL, Mueller WM, Antuono PG, Wong EC, Haughton VM, Hyde JS. Somatotopic mapping of the primary motor cortex with functional magnetic resonance imaging. *Proceedings of the Society for Magnetic Resonance in Medicine*, 1993; 3: 1397.
16. Mueller WM, Morris GL, **Binder JR**, Yetkin FZ, Estkowski L, Hammeke TA, Rao SM, Wong EC, Bandettini PA, Arfman RC, Haughton VM, Hyde JS. Brain function mapping with magnetic resonance imaging for neurosurgical planning. *Proceedings of the 61st Meeting of the American Association of Neurological Surgeons*, 1993: 343-344.
17. Morris GL, Mueller WM, Yetkin FZ, Hammeke TA, Swanson S, Haughton VM, Rao SM, **Binder JR**. Functional magnetic resonance imaging in chronic epilepsy. *Epilepsia*, 1993, 34 (Suppl 6): 122.
18. Morris GL, Mueller WM, Hammeke TA, Yetkin FZ, Swanson S, Haughton VM, Rao SM, **Binder JR**. Comparison of language lateralization by functional MRI and intracarotid amobarbital test. *Epilepsia*, 1993, 34 (Suppl 6): 77.
19. **Binder JR**, Rao SM, Hammeke TA, Frost JA, Hyde JS. Effects of stimulus complexity on functional magnetic resonance imaging (fMRI) of human auditory cortex. *Neurology*, 1994; 44 (Suppl 2): A261.
20. Rao SM, **Binder JR**, Bandettini PA, Bobholz J, Hammeke TA, Frost JA, Hyde JS. Relationship between movement rate and functional magnetic resonance signal change in primary motor cortex. *Neurology*, 1994; 44 (Suppl 2): A262.
21. **Binder JR**, Swanson S, Hammeke TA, Morris GL, Frost JA, Fischer M, Rao SM, Mueller WM, Haughton VM. Noninvasive measurement of language lateralization in chronic epilepsy patients using functional magnetic resonance imaging. *Annals of Neurology*, 1994; 36: 275.
22. **Binder JR**, Rao SM, Hammeke TA, Frost JA, Bandettini PA, Hyde JS. Syllable rate determines functional MRI response magnitude during a speech discrimination task. *Proceedings of the Society for Magnetic Resonance in Medicine*, 1994; 1: 327.
23. **Binder JR**, Rao SM, Hammeke TA, Frost JA, Cox RW, Bandettini PA, Hyde JS. Identification of auditory, linguistic, and attention systems with task subtraction functional MRI. *Proceedings of the Society for Magnetic Resonance in Medicine*, 1994; 2: 681.

24. **Binder JR**, Rao SM, Hammeke TA, Frost JA, Cox RW, Wong EC, Bandettini PA, Jesmanowicz A, Hyde JS. A lateralized, distributed network for semantic processing demonstrated with whole brain functional MRI. *Proceedings of the Society for Magnetic Resonance in Medicine*, 1994; 2: 694.
25. Rao SM, **Binder JR**, Hammeke TA, Harrington DL, Haaland KY, Bobholz JA, Frost JA, Myklebust BM, Jacobson RD, Bandettini PA, Hyde JS. Functional magnetic resonance imaging correlates of cognitive-motor learning: Preliminary findings. *Proceedings of the Society for Magnetic Resonance in Medicine*, 1994; 1: 327.
26. Swanson SJ, Hammeke TA, **Binder JR**, Fischer M, Morris GL, Mueller WM. Language lateralization ratios with functional magnetic resonance imaging and Wada testing: A preliminary report. *Journal of the International Neuropsychological Society*, 1995; 1: 141.
27. **Binder JR**, Robinson CD, Frost JA, Hammeke TA, Rao SM. Localization of linguistic and non-linguistic speech processing systems using functional MRI (fMRI). *Neurology*, 1995; 45 (Suppl 4): A371.
28. **Binder JR**, Swanson SJ, Hammeke TA, Morris GL, Mueller WM, Fischer M, Frost JA, Rao SM. Determination of language dominance with functional MRI: A comparison with the Wada test. *Human Brain Mapping*, 1995; Suppl 1: 235.
29. Rao SM, Harrington DL, Haaland KY, Bobholz JA, **Binder JR**, Hammeke TA, Frost JA, Myklebust BM, Jacobson RD, Bandettini PA, Hyde JS. Functional MRI correlates of cognitive motor learning. *Human Brain Mapping*, 1995; Suppl 1: 412.
30. Hammeke TA, Swanson SJ, **Binder JR**, Morris GL, Mueller WM. Predicting language lateralization in epilepsy with functional magnetic resonance imaging. *The Clinical Neuropsychologist*, 1995; 9: 274.
31. **Binder JR**, Robinson CD, Frost JA, Hammeke TA, Rao SM, Cox RW. Functional MRI reveals distinct linguistic and nonlinguistic speech processors. *Proceedings of the Society for Magnetic Resonance in Medicine*, 1995: 1340.
32. Cox RW, **Binder JR**, DeYoe EA, Rao SM. Analysis of inter-trial and inter-subject repeatability in whole brain functional magnetic resonance imaging. *Proceedings of the Society for Magnetic Resonance in Medicine*, 1995: 833.
33. Rao SM, Stein EA, Bobholz JA, Hammeke TA, Fuller SA, Bloom AS, **Binder JR**, Cox RW. Functional MRI of human spatial working memory. *Proceedings of the Society for Magnetic Resonance in Medicine*, 1995: 1347.
34. **Binder JR**, Frost JA, Hammeke TA, Rao SM, Cox RW. Left hemisphere activation at rest: a functional MRI study. *Neurology*, 1996; 46 (Suppl 2): A423.
35. Frost JA, **Binder JR**, Hammeke TA, Rao SM, Cox RW. Identification of arousal, attention, and auditory areas using functional MRI. *Neurology*, 1996; 46(Suppl 2): A125.
36. Hammeke TA, **Binder JR**, Swanson SJ, Frost JA, Morris GL, Fischer M, Rao SM, Mueller WM, Benbadis S. Predicting fMRI language lateralization in epilepsy with psychometric variables. *Neurology*, 1996; 46(Suppl 2): A399-400.
37. **Binder JR**, Frost JA, Hammeke TA. Function of the left planum temporale in auditory and linguistic processing. *Neuroimage*, 1996; 3: S429.
38. **Binder JR**, Bellgowan PS, Frost JA, Hammeke TA, Springer JA, Rao SM, Prieto T, O'Reilly W, Cox RW. Functional MRI demonstrates left medial temporal lobe activation during verbal episodic memory encoding. *Neuroimage*, 1996; 3: S530.
39. Crosson B, Rao SM, Woodley SJ, Rosen AC, Hammeke TA, Bobholz JA, Cunningham JM, Fuller S, **Binder JR**, Cox RW. Mapping of semantic versus phonological versus orthographic verbal working memory in normal adults with fMRI. *Neuroimage*, 1996; 3: S538.
40. Frost JA, **Binder JR**, Cox RW, Hammeke TA, O'Reilly W. How many subjects? Reliability of fMRI activation patterns as a function of sample size. *Neuroimage*, 1996; 3: S154.
41. Frost JA, **Binder JR**, Hammeke TA, Bellgowan PS, Springer JA, Newby R, Prieto T, Cox RW. fMRI of phonological language processing. *Neuroimage*, 1996; 3: S437.

42. Rao SM, Bobholz JA, Woodley SJ, Rosen AC, Hammeke TA, Fuller SA, Cunningham JM, Cox RW, **Binder JR**, Stein EA. Functional neuroanatomy of human concept formation skills. *Neuroimage*, 1996; 3: S239.
43. Rao SM, Woodley SJ, Rosen AC, Bobholz JA, Hammeke TA, Cox RW, **Binder JR**, Stein EA. Functional mapping of verbal and visuospatial working memory systems. *Neuroimage*, 1996; 3: S557.
44. Rosen AC, Rao SM, Haaland KY, Harrington DL, Bobholz JA, Woodley SJ, Hammeke TA, Fuller SA, Cunningham JM, **Binder JR**, Cox RW. Brain systems for generating heterogeneous finger movement sequences. *Neuroimage*, 1996; 3: S369.
45. **Binder JR**, Bellgowan PS, Frost JA, Hammeke TA, Springer JA, Rao SM, Cox RW. Left medial temporal activation during verbal episodic memory consolidation: a functional MRI study. *Society for Neuroscience Abstracts*, 1996; 22: 1450.
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