

IFMR FUNDED PROJECTS

1999 – 2002

Dr. Mireille Besson

Centre National de la Recherche Scientifique – Marseille, France

E-mail: Mireille.Besson@incm.cnrs-mrs.fr

Web site: : <http://www.incm.cnrs-mrs.fr>

“Music, Language and the Brain: Mutual Interactions”

\$194,000

Dr. Besson’s study explored the extent to which early musical training influences other perceptive and cognitive skills, and, in particular, language perception and comprehension. The study was conducted with children seven and eight years old using both behavioral (percentage of correct responses) and electrophysiological methods (recording of the brain electrical activity or evoked potentials). The study concluded that learning music and learning to play an instrument has profound consequences on brain development and organization.

RESEARCH PUBLICATIONS, ETC.:

In preparation ■ Regnault, P., and M. Besson. “Singing in the brain: The effect of attention.”

Submitted or under revision

- Magne, C., M. Besson, S. Robert and M. Charolles. “Verbs transitivity reveals interactions between semantics and syntax: An ERP approach.” *Cognitive Brain Research*.

In press

- Astésano, C., D. Schön and M. Besson. “Le langage et la musique dans le chant.” *Revue de Neuropsychologie*.
- Magne, C., C. Astésano, A. Lacheret-Dujour, M. Morel, K. Alter and M. Besson. “On-line processing of ‘pop-out’ words in spoken French dialogues.” *Journal of Cognitive Neuroscience*.
- Magne, C., and M. Besson. “Plasticité corticale et apprentissage musical.” *Neurosciences Sensorielles et Integratives*. Editions Solal.
- Magne, C., D. Schön and M. Besson. “Musician children detect pitch violations in both music and language better than non musician children.” *Journal of Cognitive Neuroscience*.
- Schön, D., P. Regnault, S. Ystad and M. Besson. “Sensory consonance: An event-related brain potential study.” *Music Perception*.

2005

- Schön, D., and M. Besson. “Visually induced auditory expectancy in music reading: A behavioural and electrophysiological study.” *Journal of Cognitive Neuroscience* 17(2005): 1-12.

2004

- Besson, M., C. Magne and P. Regnault. “Le traitement du langage.” *L'imagerie fonctionnelle électrique (EEG) et magnétique (MEG): Ses applications en sciences cognitives*. Ed: B. Renault. Paris: Editions Hermes – Collection Sciences Cognitives, Lavoisier, 2004. 185-216.
- Gunter, T.C, B-H. Schmidt and M. Besson. “Let’s face the music: A behavioural and electrophysiological exploration of score reading.” *Psychophysiology* 40(2004): 724-751.
- Schön, D., B. Lorber, M. Spacal and C. Semenza. “A selective deficit in the production of exact musical intervals following right hemisphere damage.” *Cognitive Neuropsychology* 21(2004): 773-785.
- Schön, D., C. Magne and M. Besson. “The music of speech: Music training facilitates pitch processing in language.” *Psychophysiology* 41(2004): 341-349.

2003

- Astésano, C., M. Besson and K. Alter. "Brain potentials during semantic and prosodic processing." *Cognitive Brain Research* 18/2(2003): 172-184.
- Besson, M., and D. Schön. "Comparison between language and music." *The biological foundations of music*. Eds: R. Zatorre and I. Peretz. Science and Medical Publications, Oxford: Oxford University Press, 2003. 269-293.

2002

- Besson, M., C. Magne and D. Schön. "Emotional prosody: Sex differences in sensitivity to speech melody." *Trends in Cognitive Science* 6(2002): 405-407.
- Schön, D., J.L. Anton, M. Roth and M. Besson. "An fMRI study of music sight-reading." *Neuroreport* 13(2002): 2285-2289.
- Schön, D., and M. Besson. "Musica Maestro!" *Psychology at the turn of the millennium: Cognitive, biological and health perspective*. Eds: L. Bäckman and C. von Hofsten. I, 2002. 119-152.
- Schön, D., and M. Besson. "Processing pitch and duration in music reading: An RT-ERP study." *Neuropsychologia* 40(2002): 868-878.

2001

- Alter, K., C. Astésano and M. Besson. "Influence des modalités intonatives sur le traitement sémantique: Une étude électrophysiologique." *Orality and Gestures. Interactions et comportements multimodaux dans la communication*. Eds: C. Cavé, I. Guaitella and S. Santi. Paris: l'Harmattan, 2001. 411-415.
- Besson, M., C. Magne, P. Regnault and D. Schön. "La musique sous l'électrode." *Neuropsychologie de la musique, Collection Questions de personne*. Amsterdam: De Boeck, 2001. 104-114.
- Besson, M., C. Magne and D. Schön. "Apport de la méthode des potentiels évoqués à l'étude du traitement prosodique." *Actes du Colloque «Prosodie»* 7(2001): 14-24.
- Besson, M., and D. Schön. "Comparison between language and music." *The biological foundations of music*. Eds: R. Zatorre and I. Peretz. *Annals of the New York Academy of Sciences* 930(2001): 232-258.
- Bonnel, A.M., F. Faita, I. Peretz and M. Besson. "Divided attention between lyrics and tunes in operatic songs: Evidence for independent processing." *Perception & Psychophysics* 63(2001): 1201-1213.
- Regnault, P., E. Bigand and M. Besson. "Different brain mechanisms mediate sensitivity to sensory consonance and harmonic context: Evidence from auditory event-related brain potentials." *Journal of Cognitive Neuroscience* 13(2001): 1-17.

2000

- Besson, M. "Le cerveau, langage et musique." *Manuel de Neuropsychologie*. Eds: F. Eustache and S. Faure. Paris: Dunod, 2000. 244-248.
- Besson, M. "What can the brain tell us about the specificity of language processing?" *Integrated Human Brain Science: Theory, Method Application (Music)*. Ed: T. Nakada. Amsterdam: Elsevier Science, 2000. 365-388.
- Besson, M., and P. Regnault. "Comparaison des processus impliqués dans certains aspects du traitement du langage et de la musique: Apport de la méthode des potentiels évoqués." *Revue de Neuropsychologie* 4(2000): 563-582.

Conference papers

2004

- Gordon, R., D. Schön and M. Besson. "An fMRI study of the neural basis of song perception." Conference on interdisciplinary musicology, Graz, Austria. 15-18 April 2004.
- Magne, C., and M. Besson. "Influence de l'apprentissage précoce de la musique sur le traitement de la hauteur tonale." Société de Neurophysiologie Clinique, Marseille, France. 10-11 June 2004.
- Moreno, S., C. Magne and M. Besson. "Influence of musical training on fundamental frequency and pitch processing: Event-related brain potentials studies of adults and children." European Conference on Tone and Intonation, Santorini, Greece. 9-11 September 2004.

2003

- Besson, M. "The specificity of language and music processing: Brain imaging studies." Sixth IBRO World Congress of Neuroscience, Prague, Czech Republic. 10-15 July 2003.
- Ystad, S., C. Magne, S. Farmer, G. Pallone, C. Astésano, V. Padeloup, R. Kronland-Martinet and M. Besson. "Influence of rhythmic, melodic and semantic violations in language and music on the electrical activity in the brain. Proceedings of the Stockholm Music Acoustics conference (SMAC 03), Stockholm, Sweden. 6-9 August 2003.

2002

- Magne, C., D. Schön and M. Besson. "Comparison of event-related brain potentials (ERPs) to prosodic violations in speech and melodic violations in music for musicians and non-musicians." International Conference on functional mapping of the human brain, Sendai, Japan. 2-6 June 2002.