

**DICHOTIC LISTENING OF BILINGUAL CHILDREN  
AT INDONESIA INTERACTIVE STANDARD SCHOOL (IIS)  
MALANG**

**THESIS**

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## ABSTRACT

Solikha, Riyadhatus. 2015. **Dichotic Listening of Bilingual Children at Indonesia Interactive Standard School (IIS) Malang**. Study Program of English, Department of Languages and Literature, Faculty of Cultural Studies, Universitas Brawijaya. Supervisor: Fatimah; Co-supervisor: Eni Maharsi.

Keywords: Dichotic listening, bilingual children, iDichotic Application, IIS Malang.

Dichotic listening is a situation when two different auditory stimuli are presented simultaneously, one in each ear, to determine which syllable is perceived as being the clearest. There is a limited number of studies that have examined dichotic listening in Indonesia especially the performance of bilingual children. This study aims to investigate what is the dominant part and ear advantage of the participants and what factors (handedness, age, and gender) that may influence dichotic listening test result of bilingual children.

Present study uses quantitative approach in order to produce clear and systematic description about the phenomena being studied. Descriptive analysis is applied in this study to describe dichotic listening test result of the participants. There are 45 right-handed bilingual children from IIS, Malang recruited as the participants. They consist of 25 boys and 20 girls, age 5-11 years old. The present study uses a tool named *iDichotic* application.

This experiment has two main findings. The first finding shows most of bilingual children (88.9%) tend to perform right ear advantage (REA) dominantly and language stimuli are processed dominantly in the left hemisphere. The second finding is the factors that influence bilingual children dichotic listening test result are handedness factor with “very strong” correlation and gender factor with “strong” correlation. The age factor is not included because the result does not show a significant difference (“very low” correlation) since the participants are in the same age category which is Critical Period Hypotheses condition.

The writer expects there will be more research conducted under dichotic listening topic, hence, the writer suggests the future research use more age variation of the participants and also the writer suggests to the Study Program of English to build a laboratory for dichotic listening research in order to make the students become interested in dichotic listening study.

## ABSTRAK

Solikha, Riyadhatus. 2015. *Dichotic Listening pada Anak Dwibahasa di Indonesia International Standard School (IISS) Malang*. Program Studi Sastra Inggris, Jurusan Bahasa dan Sastra, Fakultas Ilmu Budaya, Universitas Brawijaya. Pembimbing I: Fatimah; Pembimbing II: Eni Maharsi.

Kata kunci: *Dichotic listening*, anak dwibahasa, aplikasi *iDichotic*, IISS Malang.

*Dichotic listening* merupakan situasi dimana dua stimulus berbeda diberikan secara bersamaan, satu stimulus pada masing-masing telinga, untuk menentukan bunyi yang terdengar paling jelas. Terdapat jumlah penelitian yang terbatas terkait pembahasan *dichotic listening* di Indonesia terutama pada anak dwibahasa. Penelitian ini bertujuan untuk meneliti apakah keuntungan telinga dan dominansi otak para peserta dan apakah faktor-faktor (seperti kecenderungan penggunaan tangan (*handedness*), umur, dan jenis kelamin) yang mungkin mempengaruhi hasil dari tes *dichotic listening* pada anak dwibahasa.

Penelitian ini menggunakan pendekatan kuantitatif agar dapat menghasilkan penjelasan yang jelas dan sistematis tentang fenomena yang sedang diteliti. Analisa deskriptif diaplikasikan dalam penelitian ini untuk menganalisa hasil tes *dichotic listening* dari para peserta. 45 anak dwibahasa ber-dominansi tangan kanan dari IISS, Malang dipilih sebagai peserta penelitian. Para peserta ini berusia 5-11 tahun yang terdiri dari 25 anak laki-laki dan 20 anak perempuan. Penelitian saat ini menggunakan aplikasi *iDichotic* sebagai alat penelitian.

Didapatkan dua hasil utama dari penelitian ini. Hasil pertama menunjukkan bahwa hampir semua anak dwibahasa (88,9%) cenderung menampilkan dominansi keuntungan telinga kanan dan ransangan bahasa diproses secara dominan di otak bagian kiri. Hasil kedua adalah faktor yang mempengaruhi hasil tes *dichotic listening* anak dwibahasa adalah faktor *handedness* dengan tingkat korelasi “sangat kuat” dan faktor jenis kelamin dengan tingkat korelasi “kuat”. Faktor umur tidak dicantumkan dikarenakan hasil penelitian tidak menunjukkan perbedaan yang signifikan antar kelas umur (tingkat korelasi “sangat lemah”) dikarenakan semua peserta penelitian berada dalam kategori umur yang sama yaitu kondisi hipotesa periode kritis.

Penulis berharap akan ada lebih banyak penelitian yang membahas topik *dichotic listening*, oleh karena itu, penulis menyarankan bagi penelitian selanjutnya menggunakan peserta dengan variasi umur yang serta penulis juga menyarankan kepada Program Studi Sastra Inggris agar dapat menyediakan laboratorium untuk penelitian *dichotic listening* dengan tujuan untuk membuat para mahasiswa lebih tertarik dengan penelitian *dichotic listening*.

## REFERENCES

- Akmajian, A., Demers, R.A., Farmer, K.A., & Harnish, R.M. (2010). *An introduction to language and communication*. 6th ed. Cambridge, Massachusetts: The MIT Press.
- Ary, D., Jacobs, C.L., Sorensen, C., & Razavieh, A. (2010). *Introduction to research in education*. 8th ed. Belmont, CA: Wadsworth Cengage.
- Babbie, Earl R. (2010). *The practice of social research*. 12th ed. Belmont, CA: Wadsworth Cengage.
- Bellis, T.J., Wilber, L.A. (2001). Effects of aging and gender on interhemispheric function. *Journal of Speech, Language, and Hearing Research*, 44, 246-263.
- Bialystok, E., Hakuta., K. (1999). Confounded age: linguistic and cognitive factors in age differences for second language acquisition. In D. Birdsong (ed.) *Second language acquisition and the critical period hypothesis*. Mahwah, New Jersey: Lawrence Erlbaum Associates (LEA) Publishers.
- Bryden, M. P. (1988). *An overview of the dichotic listening procedure and its relation to cerebral organization*. In K. Hugdahl (Ed.), *Handbook of dichotic listening: Theory, methods and research* (pp.1-43). Chichester, England: Wiley.
- Bryden, M. P. (1977). Measuring handedness with questionnaires. *Neuropsychologia*, 15(4-5), 617-624.
- Crawford, J.R., Parker, D. M., McKinlay, W.M. (1992). *A handbook of Neuropsychological Assessment*. New York: Psychology Press.
- Field, J. (2004). *Psycholinguistics: the Key Concept*. New York: Routledge.
- Gresele, A.D.P., Garcia M.V., Torres E.M.O., Santos S.N., & Costa M.J. (2013). Bilingualism and auditory processing abilities: performance of adults in dichotic listening tests. *CoDas online version Sao Paulo*. vol.25, n.6, pp. 506-512. ISSN 2317-1782. Retrieved February 17, 2015 from <http://dx.doi.org/10.1590/S2317-17822014000100003>
- Hakuta, K. (2008). *Encyclopedia of neuroscience*. Retrieved February 17, 2015 from [http://web.stanford.edu/~hakuta/Publications/\(2008\)%20-%20Encyclopedia%20of%20Neuroscience,%20Hakuta.pdf](http://web.stanford.edu/~hakuta/Publications/(2008)%20-%20Encyclopedia%20of%20Neuroscience,%20Hakuta.pdf)
- Hannay, H. J. (1988). *Experimental techniques in human neuropsychology*. United Kingdom: Oxford University Press.

- Haugen, E. (1956). *Bilingualism in the america: A Bibliography and Research Guide*. Alabama: University of Alabama Press
- Hugdahl, K., Andersson, L. (1986). The "forced-attention paradigm" in dichotic listening to CV-syllables: a comparison between adults and children. *Cortex*, 22(3), 417-432.
- Hugdahl, K. (2003). *Dichotic listening in the study of auditory laterality*. In K. Hugdahl & R. J. Davidson (Eds.), *The asymmetrical brain*. Cambridge, Mass.: MIT Press.
- Hugdahl, K., Bless., Westerhausen, R., Arciuli, J., Kompus, K., Gudmundsen, M. (2013). "Right on all occasions?" – On the feasibility of laterality research using a smartphone dichotic listening application. *Frontiers in Psychology*, Volume 4, Article 42. Retrieved April 17, 2015 from <http://dx.doi.org/10.3389%2Ffpsyg.2013.00042>
- Hugdahl, K., Westerhausen, R. (2010). *The two halves of the brain*. Cambridge: MIT Press.
- Hugdahl, K., Westerhausen, R., Alho, K., Medvedev, S., Laine, M., & Hämäläinen, H. (2009). Attention and cognitive control: unfolding the dichotic listening story. *Scandinavian journal of psychology*, 50(1), 11-22.
- Hugdahl, K., Westerhausen, R., Alho, K., Medvedev, S., & Hamalainen, H. (2008). The effect of stimulus intensity on the right ear advantage in dichotic listening. *Neuroscience Letters*, 431(1), 90-94.
- Indonesia International Standard School. *Profil sekolah*. Retrieved October 12, 2014 from <http://20586398.siap-sekolah.com/sekolah-profil/>
- Indonesia International Standard School. *School profile*. Retrieved October 12, 2014 from [www.sekolah-international.com](http://www.sekolah-international.com)
- Itunes. (n.d). *iDichotic*. Retrieved April 25, 2014, from <https://itunes.apple.com/us/app/idichotic/id487280424?mt=8>
- Janke, L., Buchanan, T. W., Lutz, K., and Shah, N. J. (2001). Focused and nonfocused attention in verbal and emotional dichotic listening: an fmri study. *Brain and language*, 78, 349–363. Retrieved April 28, 2014, from <http://www.idealibrary.com>
- Jeffrey, S., Martin, M.A., James F., Jerger, J. (2005). Some effects of aging on central auditory processing. *Journal of rehabilitaion research & development (JRDD)*, Volume 42, Number 4, Page 25-44.
- Jerger J, Alford B, Lew H, Rivera V, Chmiel R. (1995). Dichotic listening, event-related potentials, and interhemispheric transfer in the elderly. *Ear hear* 16 :4821198.

- Jerger, J., Chmiel, R., Allen, J., & Wilson, A. (1994). Effects of age and gender on dichotic sentence identification. *Ear and hearing*, 15, 274–286.
- Kimura, D. (1961). Cerebral dominance and the perception of verbal stimuli. *Canadian journal of psychology*, 15(3), 166-171.
- Kimura, D. (1961). Some effects of temporal-lobe damage on auditory perception. *Canadian journal of psychology*, 15, 156-165.
- Kline, Makenzie. (2009). *Dichotic word recognition of young adult in adverse listening conditions*. Thesis, Ohio, Department of Speech and Hearing Science, Ohio State University.
- Lenneberg, E. (1967). *Biological foundation of language*. New York: John Wiley Sons, Inc.
- Litosseliti, L. (ed). (2010). *Research methods in linguistics*. London: Continuum.
- Lynn, W. L. (2010). *Dichotic listening among adults who stutter*. Thesis, New Zealand, Audiology, University of Canterbury
- Muijs, D. (2004). *Doing quantitative research in education with SPSS*. London: SAGE Publications
- Musiek, F.E., Moncrieff, D.W., (2002). Interaural asymmetries revealed by dichotic listening tests in normal and dyslexic children. *Journal of the american academy of audiology*, Volume 13, Number 8, September 2002. Retrieved February 17, 2014 from [http://www.audiology.org/sites/default/files/journal/JAAA\\_13\\_08\\_04.pdf](http://www.audiology.org/sites/default/files/journal/JAAA_13_08_04.pdf)
- Mundhra, Sumit. (2005). *Brain and language: importance of brain in language processing*. Retrieved April 28, 2014, from [http://www.cse.iitk.ac.in/project\\_summitMundhra\\_pdf](http://www.cse.iitk.ac.in/project_summitMundhra_pdf)
- Nababan, P.W.J. (1993). *Sociolinguistics: 'Sebuah pengantar'*. Jakarta: Gramedia Pustaka.
- Norrelgen, F., Lilja, A., Ingvar, M. Gisselgard, J., Fransson, P. (2012). Language lateralization in children aged 10 to 11 years: a combined fMRI and dichotic listening study. *PLoS ONE*, Volume 7 (12): e51872. Retrieved April 28, 2014, from 10.1371/journal.pone.0051872
- Oldfield, R.C. (1971). The assessment and analysis of handedness: the Edinburgh Inventory. *Neuropsychologia*, 9, 97-113.
- Passow, S., Westerhausen, R., Wartenburger, I., Hugdahl, K., Heekeren, H. R., Lindenberger, U., Li, S. C. (2011). Human aging compromises attentional control of auditory perception. *Psychology and aging*. Retrieved April 25, 2014 from 10.1037/a0025667

- Piazza, D.M. (1980). The influence of sex and handedness in the hemispheric specialization of verbal and nonverbal tasks. *Neuropsychologia*, 18 (2), 163-176.
- Publicity Malang. *Indonesia international standard school sekolah berwawasan islam*. Retrieved October 12, 2014, from <http://publicity.co.id/uncategorized/2013/06/indonesia-international-standard-school-sekolah-berwawasan-islam/>
- Scovel, T. (1998). *Psycholinguistics (Oxford introduction to language study)*. Great Britain: OUP.
- Scotton, C.M. (2006). *Multiple voices, an introduction to bilingualism*. Oxford, UK: Blackwell Publishing Ltd.
- Starck, R., Genesee, F., Lambert, W., Seitz, M. (1997). *Language development and neurological theory*. New York, Academic Press.
- Sugiyono. 2007. *Metode penelitian kuantitatif kualitatif dan R&D*. Bandung: Alfabeta
- University of Bergen. *News*. Retrieved April 25, 2014, from <http://www.uib.no/en/news/36449/new-brain-test-app>
- Van Strien, J.W. (2002). *The ducth handedness questionnaire*. Paper, Rotterdam, Department of Psychology, Erasmus University
- Wilson, R.H., Leigh, E.D. (1996). Identification by right- and left- handed listeners on dichotic CV materials. *Journal of the american academy of audiology*, 7, 1-6.