



**LLCd Symposium.**  
**SPEAKERS AND PRESENTATIONS.**

- Name:** Bhoomika Kar
- Affiliation:** Centre for Behavioural and Cognitive Sciences (CBSS), University of Allahabad, India
- Brief Bio:** Dr. Bhoomika Rastogi Kar is a Reader at the Centre of Behavioural and Cognitive Sciences (CBCS), University of Allahabad. She is interested in the field of cognitive neuroscience. During her doctoral work at the National Institute of Mental Health and Neurosciences (NIMHANS), she studied the growth patterns of cognitive functions, and developed a neuropsychological test battery for children. Her current work, partly funded by the Department of Science and Technology (India), uses behavioural and EEG/ERP studies to examine the neuroscience of cognitive control in the context of language processing among bilinguals and during affect processing. Her work on bilingualism includes studies on language switching, effect of bilingualism on cognitive control, and methodological concerns related to assessment of bilingualism. A current collaboration is with Prof. Michael I. Posner, University of Oregon (USA) on bilingualism and attention. Bhoomika is currently the Convener of the Cognitive Division of the National Academy of Psychology (India) and included among her other roles are the following: the Consulting Editor for the International Journal of Mind, Brain and Cognition and reviewer for Archives of Clinical Neuropsychology, Journal of Educational and Developmental studies and Psychological Studies.
- Theme:** Language Diversity and Cognitive Science
- Title of Presentation:** Bilingualism, Language proficiency and Cognitive Control
- Abstract:** With the expanding scope of bilingualism, cognitive and linguistic aspects related to bilingualism have gained prominence gradually. We present our work on a) characterizing bilingualism with respect to language proficiency in L1 and L2 among Hindi-English bilinguals in Indian context and how it is important to account for certain factors, such as language use and proficiency in both L1 and L2, that may influence the interaction between bilingualism and higher cognitive processes such as cognitive control. In the first part we examine the language skills in speaking/understanding and reading/writing domain for L1 and L2 and the factor structure of L1 and L2. Results based on a language background questionnaire and an indigenous tool of language proficiency indicate better performance on L1 in all four domains of language function as compared to L2. There was no correlation between self reported information on age of acquisition and objective measures of language proficiency. L1 language skills emerged as independent factors whereas L2 skills clustered as 1-2 components. Data based on L1 and L2 proficiency across domains showed normal distribution. Language proficiency in L1 and L2 as a predictor variable could serve as an important correlate of the effects of bilingualism on language processing and other cognitive processes.

In the second part of the paper we present the implications of such a characterization of language proficiency in Hindi and English through our experiments on selection and inhibition and bilingual language processing in terms of the interaction between levels of bilingualism and these control processes. Experiment 1 investigated voluntary orienting with respect to lexical processing in L1 and L2 using endogenous spatial cuing with 20 Hindi English bilingual adults. Experiment 2 investigated inhibitory control in bilingual language processing using the negative priming (spatial) paradigm. Meaningful words in Hindi/English were presented superimposed on one another and participants were required to respond to the word in darker/lighter shade making an animacy judgment. Results pertaining to the selection and inhibition components of cognitive control as predicted by language proficiency among bilinguals indicate that it requires less effort while orienting to L1 whereas it requires greater inhibitory control while inhibiting L1. Our ERP study on inhibitory control in Hindi and English using the same negative priming paradigm showed larger N200 component at the central frontal sites for L1 as compared to L2 which is consistent with the behavioural results mentioned above. Language proficiency in L2 was found to predict negative priming effects for L2. However task specific language proficiency score pertaining to reading comprehension in L1 predicted performance for L1 inhibitory control. Thus, language proficiency in both L1 and L2 (though in different ways) predict experimental results pertaining to control processes involved in bilingual language processing. Selection and inhibition components of cognitive control have differential effects on L1 and L2.