Mapping the task for the second language learner: the case of Japanese acquisition of /r/ and /l/. Andrew J. Lotto¹, Momoko Sato², & Randy L. Diehl², ¹Center for Hearing Research, Boys Town National Research Hospital, Omaha, NE, USA, ²Dept. of Psychology, University of Texas, Austin, TX, USA. [Full Paper Available on CD]

The acquisition of a foreign phonetic contrast requires the second language (L2) learner to attend to those acoustic dimensions that are informative for the distinction and to manipulate values along those dimensions during production. The discovery of informative dimensions in L2 can be complicated by the contrasts present in the native (L1) language. A well-known example is the difficulty that native Japanese speakers have perceiving or producing the English /l/-/r/ distinction. Here, we attempt to systematically describe this L2 learning task by obtaining distributions of acoustic measures (formant frequencies and durations) from native English productions of word-initial /l/ and /r/. These distributions include inter-speaker (gender), intra-speaker, and phonetic (vowel environment) variance. These results reveal that F3-onset frequency provides almost complete discrimination between the distributions. Distributions of native-Japanese productions of /l/ and /r/ were also collected. The Japanese distributions can be partially separated on F2 and F3 onset frequency. All of these distributions are compared to a distribution of native productions of the Japanese rhotic flap. The flap distribution overlaps the native /r/ and /l/ distributions in F2xF3 space. Further measures of native productions reveal that the flap is contrasted with Japanese /w/ mainly by the onset frequency of F2. Thus, the Japanese productions of /l/ and /r/ appear to be influenced by both the informative variance in L2 distributions (F3) and by the informative variance in distributions of similar L1 categories (F2). [Supported by NIH grants 5 R01 DC004674 (AJL), 5 R01 DC00427 (RLD).]