

ERP correlates of relational learning II: Testing a visual-visual and auditory-visual priming

Results:

The present study examined the behavioural and electrophysiological correlates of derived relational responding (stimulus equivalence). Participants were trained, but not tested, for the formation of 4, 3-member stimulus relations (A1-B1-C1, A2-B2-C2, A3-B3-C3, and A4-B4-C4) consisting of pseudowords, before then receiving a relatedness decision task that presented all combinations of stimulus pairs (Directly Trained (i.e., A1-B1), Symmetry (i.e., B1-A1) and Equivalence (i.e., C1-B1), as well as Between Pair directly trained (i.e., A1-B2), symmetry (i.e., B1-A2), and equivalence (i.e., C1-B2) trials. Analyses compared each of these trial-types, as well as Within and Between comparisons. Thirty-five healthy controls were recruited. Twenty-one participants passed the final matching to sample test for derived relations. Behavioural results indicated that reaction times on Equivalence trials were significantly slower than all other trials types. Directly Trained trials were marginally faster than Symmetry trials ($p = .49$) and Equivalence trials ($p < .000$); Symmetry trials were significantly faster than Equivalence trials ($p < .000$); and Between trials were significantly slower than Within trials ($p = .01$). With the EEG data, a series of repeated ANOVAs were calculated across three frequency ranges (i.e., alpha, beta, and theta). Significant results for mean amplitude were typically found in the 4 to 8 Hz (theta) range, 350 ms after target onset, whereas peak mean amplitude differences were typically found in the theta range 250 ms after target onset. Overall, equivalence trials evoked greater negativity than symmetry or directly trained trials. Further analyses are ongoing, but the present preliminary findings are supportive of a derived relations approach to the electrophysiological correlates of relational learning.

Published works:

Want, T., & Dymond, S. (2013). Event-related potential correlates of emergent inference in human arbitrary relational learning. *Behavioural Brain Research*, 236(1), 332-43. doi: 10.1016/j.bbr.2012.08.033

Area(s) of interest:

Relational learning, derived stimulus relations, matching to sample, relatedness decision task.

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