The Positive Effects of Processing Instruction on the Acquisition of French as a Second Language: An Eye-Tracking Study

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Abstract : Processing Instruction is a psycholinguistic pedagogical approach drawing insights from the Input Processing Model which establishes the initial innate strategies used by second language learners to connect form and meaning of linguistic features. With the ever-growing use of technology in Second Language Acquisition research, the present study uses eye-tracking to measure the effectiveness of Processing Instruction in the acquisition of French and its effects on learner's cognitive strategies. The experiment was designed using a TOBII Pro-TX300 eye-tracker to measure participants' default strategies when processing French linguistic input and any cognitive changes after receiving Processing Instruction treatment. Participants were drawn from lower intermediate adult learners of French at the University of Greenwich and randomly assigned to two groups. The study used a pre-test/post-test methodology. The pre-tests (one per linguistic item) were administered via the eye-tracker to both groups one week prior to instructional treatment. One group received full Processing Instruction treatment (explicit information on the grammatical item and on the processing strategies, and structured input activities) on the primary target linguistic feature (French past tense imperfective aspect). The second group received Processing Instruction treatment except the explicit information on the processing strategies. Three immediate post-tests on the three grammatical structures under investigation (French past tense imperfective aspect, French Subjunctive used for the expression of doubt, and the French causative construction with Faire) were administered with the eye-tracker. The eye-tracking data showed the positive change in learners' processing of the French target features after instruction with improvement in the interpretation of the three linguistic features under investigation. 100% of participants in both groups made a statistically significant improvement (p=0.001) in the interpretation of the primary target feature (French past tense imperfective aspect) after treatment. 62.5% of participants made an improvement in the secondary target item (French Subjunctive used for the expression of doubt) and 37.5% of participants made an improvement in the cumulative target feature (French causative construction with Faire). Statistically there was no significant difference between the pre-test and post-test scores in the cumulative target feature; however, the variance approximately tripled between the pre-test and the post-test (3.9 pre-test and 9.6 post-test). This suggests that the treatment does not affect participants homogenously and implies a role for individual differences in the transfer-of-training effect of Processing Instruction. The use of eye-tracking provides an opportunity for the study of unconscious processing decisions made during moment-by-moment comprehension. The visual data from the eye-tracking demonstrates changes in participants' processing strategies. Gaze plots from pre- and post-tests display participants fixation points changing from focusing on content words to focusing on the verb ending. This change in processing strategies can be clearly seen in the interpretation of sentences in both primary and secondary target features. This paper will present the research methodology, design and results of the experimental study using eye-tracking to investigate the primary effects and transfer-of-training effects of Processing Instruction. It will then provide evidence of the cognitive benefits of Processing Instruction in Second Language Acquisition and offer suggestion in second language teaching of grammar.

Keywords : eye-tracking, language teaching, processing instruction, second language acquisition