

The effect of feedback validity on learning in children and adults: an electrophysiological study

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The present study evaluated at the behavioral and neurophysiological level the effect of feedback validity on learning in adults and children. Participants (82 children aged 7-11; 42 adults aged 18-25) completed a two-choice classification task, in which they sorted items from eight different categories into one of two bins, by pressing one of two buttons on a response box. Each response was followed by positive or negative feedback. Four of the eight categories were mapped consistently to a specific response, leading to consistent valid feedback. The other four were mapped to a specific response 80% of the time; in 20% of these trials, participants received invalid feedback. As participants performed the task, their EEG data were recorded. Behaviorally, accuracy was greater for the consistently valid condition than the inconsistently valid condition for both adults and children. There were no significant differences in accuracy between adults and children. Feedback-related event related potentials (ERPs) were evaluated and compared between the two groups. The amplitudes of the feedback related negativity (FRN) and fronto-central positivity (FCP) were sensitive to valence and age group, with FRN being larger in children, and FCP larger in adults. Interaction effects suggested that FRN response to positive feedback was sensitive to feedback validity in both age groups. However, the FCP was sensitive to validity for only for positive feedback in children and only for negative feedback in adults. These results further evidence of differing neurophysiological reactions to feedback in learning between children and adults.