

Eye Movement Analysis of Time Discounting

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Abstract

This paper reveals the decision process of solving time discounting task by using eye tracker. There is a hypothesis that the time discounting anomalies result not from calculating the present discount values of smaller-earlier and larger-later rewards but from comparing the attributes such as the timing of receipts and the amount of rewards in each option separately. The eye movement data shows that the proportion of calculating the present discount values is almost the same as that of comparing the attributes. First the subjects mainly calculate the present discount value in earlier option and then they gradually combine calculating the present discount values with comparing the attributes at the same proportion. The experimental result supports the attention focusing hypothesis which implies that when the timing of receipts is written in the delay subjects are more prone to calculate discounting rate than when it is written in the date. The subjects who have hyperbolic discounting function are the higher proportion of calculating the present discount value in the “today” reward than the subjects who have exponential discounting function. The longer subjects fixate on the timing of receipt and the amount of reward in the earlier option, the more they choose the option, and vice versa.

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