

# Calculating the value of effortful behavior: A clue to schizophrenia-related disability?

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Many people with schizophrenia have marked problems with motivation, failing to initiate and persist in goal-directed behavior. These negative symptoms of schizophrenia can be disabling and prevent individuals from realizing their potential.

For many years it was thought this was due to an inability to experience pleasure associated with successful goal attainment. However, recent laboratory studies have shown that hedonic experience is actually intact in people with [schizophrenia](#), calling for new approaches to better understand these motivational deficits.

In a new study published in *Biological Psychiatry*, Dr. James Gold, at the University of Maryland School of Medicine, and his colleagues now provide a new clue to the relationship between motivational deficits and [functional impairment](#).

They theorized that the lack of motivation may stem from a decreased [willingness](#) to expend effort to gain rewards. In other words, individuals with schizophrenia may be less able to properly evaluate future [reward](#) in terms of the 'cost' of the effort required.

To test this, the researchers recruited individuals with schizophrenia and a comparison group of healthy individuals. The individuals with schizophrenia were also evaluated for their symptom levels. All participants completed a computerized effort-cost decision-making task in the laboratory. This task required them to make decisions between

two alternatives: an easy option with a minimal reward, and a harder option with a higher-value reward.

They found that [schizophrenia patients](#), especially those with prominent negative symptoms, were more likely to choose the less demanding tasks that provided smaller rewards and were less likely than healthy subjects to choose more demanding tasks that offered greater rewards.

"In essence, [patients](#) with severe negative symptoms calculate the 'cost' of potential effort versus the value of potential awards using a different equation than healthy volunteers or other people with schizophrenia who do not have severe motivational problems. The cost of effort is more salient than the potential increase in reward value," explained Gold.

These findings suggest that negative symptoms are associated with abnormalities in how patients weigh the cost of the effort needed to receive a reward or reach a goal. Importantly, these abnormalities were seen consistently only in those patients with high levels of negative symptoms. It seems that these patients were particularly averse to the higher effort required for larger rewards and/or that they did not find the higher reward worth the extra effort required.

Dr. John Krystal, Editor of *Biological Psychiatry*, commented, "It is important to understand the disadvantageous choices that patients make because it may be possible, through education, rehabilitation, and perhaps medication to help patients make better progress in their rehabilitation."

**More information:** The article is "Negative Symptoms of Schizophrenia Are Associated with Abnormal Effort-Cost Computations" by James M. Gold, Gregory P. Strauss, James A. Waltz, Benjamin M. Robinson, Jamie K. Brown, and Michael J. Frank ([doi: 10.1016/j.biopsych.2012.12.022](https://doi.org/10.1016/j.biopsych.2012.12.022)). The article appears in *Biological*

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