Eating to stop: Tyrosine supplementation enhances inhibitory control but not response execution

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Highlights
- Supplementation of tyrosine enhances brain dopamine (DA).
- Tyrosine promotes response inhibition but not response execution.
- Tyrosine supplementation may act to enhance cognitive control.

Abstract
Animal studies and research in humans have shown that the supplementation of tyrosine, or tyrosine-containing diets, increase the plasma tyrosine and enhance brain dopamine (DA). However, the strategy of administering tyrosine (and the role of DA therein) to enhance cognition is unclear and heavily debated. We studied, in a healthy population, whether tyrosine supplementation improves stopping overt responses, a core cognitive-control function. In a double-blind, placebo-controlled, within-subject design, one hour following the administration of tyrosine (corresponding to the beginning of the 1 h-peak of the plasma concentration) or placebo, participants performed a stop-signal task—which taps into response inhibition and response execution speed. Participants in the Tyrosine condition were more efficient in inhibiting unwanted action tendencies but not in reacting to go signals. This is the first demonstration that the supplementation of tyrosine selectively targets, and reliably improves the ability to stop overt responses.

Keywords
Tyrosine; Dopamine; Stop-signal task; Inhibitory control

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