

Response Time Determines Response Selection in Cognitive Control

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Presentation Abstract Summary According to common theories of cognitive control, conflicts between automatic and deliberate responses are resolved through a complex interaction between underlying preparatory processes, culminating in a response being generated when one of these processes exceeds a prescribed threshold. Thus, response times are thought to be a consequence of the dynamics of conflict resolution. An alternative theory is that response initiation occurs independently of the process whereby conflicts become resolved during response preparation. Under this theory, the reaction time plays a causal role in determining which response is ultimately expressed. We tested this idea using a timed-response paradigm to force human participants to generate responses at a range of imposed delays following presentation of a stimulus. We found that varying the time of a response has a dramatic effect on how participants responded. Furthermore, the qualitative pattern of behavior observed corresponded well with a mathematical model describing the relationship between response time and the probability of generating various responses. We conclude that response initiation plays a decisive and causal role in determining response outcome in resolving response conflicts.

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