

# Cognitive underpinnings of COVID-19 vaccine hesitancy

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## Abstract

**Rationale:** Vaccines save lives. Despite the undisputed value of vaccination, vaccine hesitancy continues to be a major global challenge particularly throughout the COVID-19 global pandemic. Since vaccination decisions are counter-intuitive and cognitively demanding, we propose that vaccine hesitancy is associated with executive function—a group of high level cognitive skills including attentional control, working memory, inhibition, self-regulation, cognitive flexibility, and strategic planning. **Objective:** We set out to test (i) whether vaccine hesitancy is driven by individual differences in executive function beyond established socio-demographic factors (e.g., education, political orientation, gender, ethnicity, age, religiosity) and depressed mood, and (ii) whether this relationship is exacerbated by situational stress. **Method:** Two studies were conducted with U.S. residents. Using a cross-sectional design, Study 1 examined the associations between executive function, socio-demographics factors, COVID-19 conspiracy beliefs, trust in health authorities, and COVID-19 vaccine hesitancy. Using an experimental design, Study 2 focused solely on unvaccinated individuals and tested the interactive effect of executive function and stress on willingness to receive a COVID-19 vaccine. We used ordinal logistic regressions to analyze the data. **Results:** Individual differences in executive function predicted participants' COVID-19 conspiracy beliefs, trust in health authorities, and their willingness to vaccinate against COVID-19. Importantly, the unique contribution of executive function to vaccine hesitancy could not be explained by sociodemographic factors or depressed mood. Furthermore, Study 2 revealed that weaker executive function had detrimental effects on COVID-19 vaccine acceptance and on trust in authorities mainly under heightened stress. **Conclusions:** Individual differences in executive function and situational stress jointly impact COVID-19 vaccination decisions and need to be considered together when designing health communications aimed at reducing COVID-19 vaccine hesitancy. Interventions which reduce stress and promote trust have the potential to increase vaccine acceptance, especially for individuals with weaker executive function.

**Keywords:** *vaccination; health; COVID19*

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