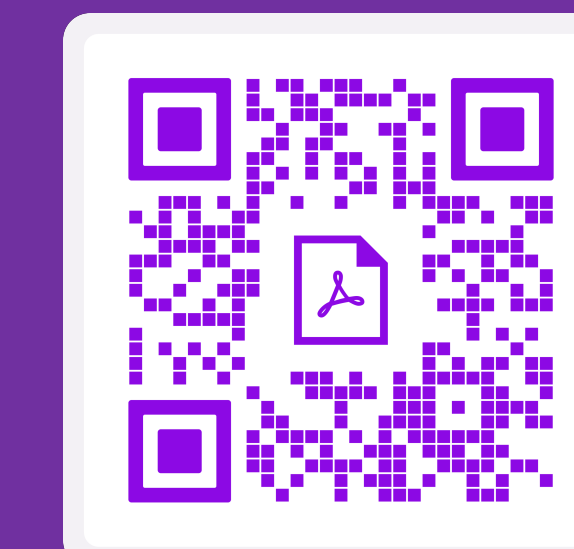




# Psychological Barrier to mRNA COVID-19 Vaccine Acceptance

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## Introduction

Vaccine hesitancy is still a serious issue, and 30% of Americans still not fully vaccinated for COVID-19 (as of May 10<sup>th</sup>, 2023; CDC, n.d.), despite full FDA approval and no-cost availability.

Here we explore these psychological causes

- Overweighting the dangers of vaccine
- Underweighting dangers of COVID-19
- Reduced perceived efficacy due to the need for boosters
- Lack of Trust in Government and Health care workers

Protection Motivation Theory(Rogers, 1975)

- Anti-viral drugs perceived as safety net
- Anticipated regret for a negative outcome stemming from action as opposed to inaction

Omission Bias (Baron & Ritov, 1994)

The current study aims to

1. uncover some of the *psychological causes* of mRNA vaccine hesitancy.
2. provide insights for improved and targeted communication for future health crises

## Methods

### Participants

- A total of 1,001 participants were analyzed
- Recruited from Prolific (Oct. 13 – Oct. 17, 2022)

### Measures

- Vaccination status (main DV)
- Perceived risk, fear, & anxiety for COVID-19
- Perception of mRNA vaccine science
- Fear & anxiety towards mRNA vaccines
- Trust in vaccine technology
- View towards need for booster shots
- Perceived effectiveness of anti-viral medication
- Likelihood of contracting COVID-19
- Anticipated regret for getting vaccine and suffering from side effects vs. not getting vaccine and suffering from COVID-19
- Demographic information

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## Summary

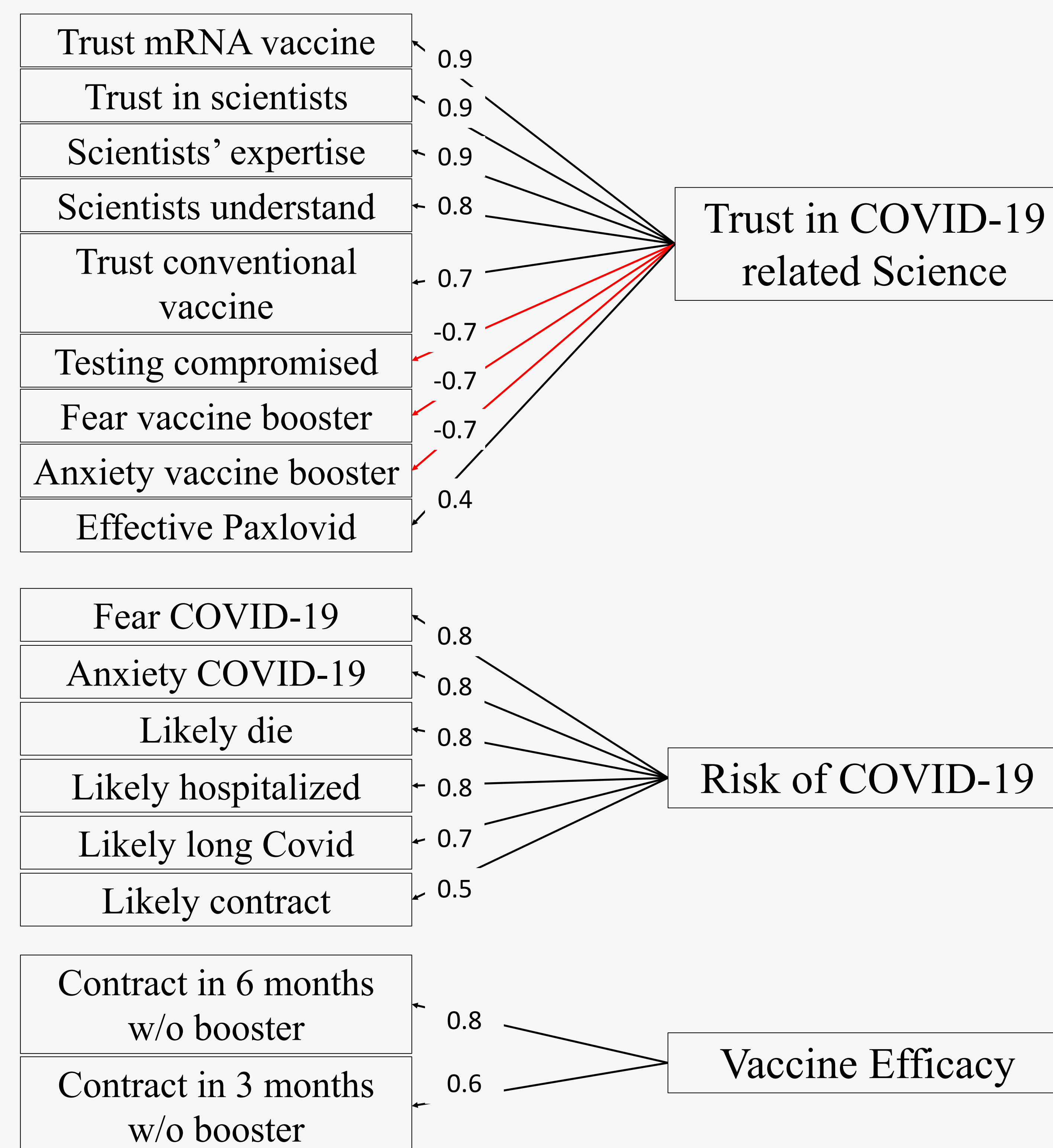
Among late-stage unvaccinated people, distrust in COVID-19 related science (scientists, vaccine, booster, anti-viral medication) was a significant psychological factor, rather than the risk of COVID-19 itself.

Additionally, the need for booster was perceived as evidence for ineffectiveness of vaccine.

Those with higher trust in COVID-19 related science, belief that booster shot is continued efforts of scientists, higher education, higher income, and those who anticipate more regret from not getting vaccine were more likely to have been vaccinated.

## Results

### Exploratory Factor Analysis on continuous variables



Red lines indicate negative loading to the latent factor. Likelihood of contracting COVID-19 w/o boosters were reverse coded for vaccine efficacy factor.

## References

- Centers for Disease Control and Prevention. (n.d.-d). *COVID-19 Vaccinations in the United States*. CDC Data Tracker. Retrieved October 16, 2023, from [https://covid.cdc.gov/covid-data-tracker/#vaccinations\\_vacc-people-one-dose-pop-pop65](https://covid.cdc.gov/covid-data-tracker/#vaccinations_vacc-people-one-dose-pop-pop65)
- Rogers, R. W. (1975). A protection motivation theory of fear appeals and attitude change. *The journal of psychology*, 91(1), 93-114.
- Baron, J., & Ritov, I. (1994). Reference points and omission bias. *Organizational behavior and human decision processes*, 59(3), 475-498.

## Results cont.

Logistic regression predicting vaccination status (fully vaccinated vs. not fully vaccinated)

Continuous predictors	Odds Ratio	P
Trust in COVID-19 related Science	<b>3.33***</b>	<.001
Risk of COVID-19	0.82	.09
Effectiveness of vaccine	1.05	.67
Age	1.01	.09
Categorical predictors		
Regret		
No regret	Reference	
Regret no vaccine	<b>3.95***</b>	<.001
Regret vaccine	0.65	.14
Same regret	1.07	.81
View towards booster shot		
Not working	Reference	
Continued effort	<b>2.90***</b>	<.001
Education Level		
Lower than Bach.	Reference	
Bach. or higher	<b>2.32***</b>	<.001
Annual income		
Lower than median	Reference	
Higher than median	<b>2.49***</b>	<.001
Ethnicity		
White-American	Reference	
African-American	0.87	.67
Asian-American	<b>4.32**</b>	.01
Bi-racial	0.85	.77
Hispanic-American	0.89	.75
Middle Eastern	3.91	.32
Gender		
Female	Reference	
Male	0.81	.36
Other	1.48	.65
Political ideology		
Liberal	Reference	
Conservative	0.71	.25
Moderate	0.71	.20

## Conclusion

- Risk communication should emphasize the safety of protective measure.
- Emphasize appropriate action rather than employing fear tactics.
- Carefully crafted communication needs to follow the science to overcome psychological barrier.