

Testing Tobacco Messages During COVID-19 (#40479)

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1) Have any data been collected for this study already?

No, no data have been collected for this study yet.

2) What's the main question being asked or hypothesis being tested in this study?

The objectives of this study are to:

- 1) Identify the elements of messages about vaping that most discourage vaping
- 2) Identify the elements of messages about smoking that most discourage smoking
- 3) Identify the groups for which these messages are most effective

We will separately test messages to discourage vaping and messages to discourage smoking. For each behavior, will examine three message elements: the number of health harms discussed (none, one, or three), the specific health harm(s) discussed (none, immune function, lung damage, heart damage, or all three), and the severity of COVID-19 included in the message (not included, infection, hospitalization, or death). We have the following hypotheses about how these elements will affect perceived message effectiveness:

Hypothesis 1: Messages that describe COVID-19 elicit higher perceived effectiveness than control messages without discussion of COVID-19.

Hypothesis 2: Messages that describe one health harm elicit higher perceived effectiveness than messages that describe no health harms, and lower perceived effectiveness than messages that describe three health harms.

Hypothesis 3: The combined effects of a COVID-19 message and a health harms message is less than additive (i.e., diminishing returns from additional message elements).

We will also examine whether: 1) messages that describe more severe COVID outcomes are perceived as more effective than messages that describe less severe COVID outcomes (i.e., death vs. hospitalization, death vs. infection, and hospitalization vs. infection), and 2) specific health harms elicit higher perceived effectiveness ratings than other harms (e.g., comparing heart damage to lung damage). We do not have specific hypotheses about these comparisons.

We will also examine the secondary outcomes listed in Question 8 and expect they will show the same pattern of results as the primary outcome, perceived message effectiveness. We will additionally examine the other outcomes listed in Question 8, but do not have hypotheses about these outcomes.

3) Describe the key dependent variable(s) specifying how they will be measured.

The primary outcome is perceived message effectiveness (PME) for discouraging vaping or smoking, each measured using 3 items adapted from Baig et al. (2018). We will average responses on the 3 items to create PME scores.

4) How many and which conditions will participants be assigned to?

This study uses a between-subjects factorial design. Factors are:

- 1) Severity of COVID-19 (none/not included, included [randomly assign to infection, hospitalization, death])
- 2) Specific health harms (none, one harm [randomly assign to immune function, lung damage, or heart damage], or three harms)

5) Specify exactly which analyses you will conduct to examine the main question/hypothesis.

Analyses will use OLS, regressing outcomes on a set of indicator variables for number of health harms discussed, an indicator variable for whether COVID is discussed, and the interactions between number of health harms and whether COVID is discussed. If the interaction terms are not statistically significant, we will re-run the model without these terms for parsimony.

First, we will examine main effects of whether COVID is discussed (yes vs. no) and the number of health harms discussed (0 vs. 1 vs. 3). Hypothesis 1 will be supported if the average differential effect of discussing COVID is positive and statistically significant. Hypothesis 2 will be supported if the average differential effect of three health harms vs. one harm is positive and statistically significant and the average differential effect of one health harm vs. zero harms is positive and statistically significant. Next, we will examine the interaction terms. Hypothesis 3 will be supported if the coefficients on the interaction terms are negative and statistically significant. We will probe significant interactions by examining predicted mean PME at each level of the moderators. We will repeat the analyses in this paragraph for the secondary and other outcomes; we may exclude the interaction terms from analyses of secondary and other outcomes if the interactions were not significant in analyses of the primary outcome.

We will also use OLS regression to assess whether messages that discuss more severe COVID outcomes elicit higher perceived message effectiveness ratings than messages discussing less severe COVID outcomes. These models will include indicators for level of COVID severity and will use post-estimation commands to compare perceived effectiveness ratings for more severe vs. less severe COVID messages. Similarly, we will use OLS regression (and associated post-estimation commands) with indicator variables for health harm discussed to assess whether specific health harms (e.g., heart damage) elicit higher perceived message effectiveness ratings compared to other harms (e.g., lung damage).

We will use a critical alpha of 0.05 and statistical tests will be two-tailed. We will also report results when controlling for any participant characteristics found to be unbalanced across treatment arms in balance tests, if these results differ substantively from unadjusted results in analyses of the primary outcome (i.e., changes in statistical significance or direction of effect).

6) Describe exactly how outliers will be defined and handled, and your precise rule(s) for excluding observations.

To prevent duplicate responses, we will identify duplicate participant IDs and retain only the first record randomized for each ID. For analyses using body mass index, we will recode BMIs of <10 or >80 as missing, as these represent biologically implausible values.

7) How many observations will be collected or what will determine sample size? No need to justify decision, but be precise about exactly how the number will be determined.

We will collect survey responses until ~800 adult (18 years and older) participants have completed the survey. Participants will be current smokers, e-cigarette users, or dual-users of both cigarettes and e-cigarettes.

8) Anything else you would like to pre-register? (e.g., secondary analyses, variables collected for exploratory purposes, unusual analyses planned?)

We will ensure that Cronbach's alphas for the 3-item PME scales are sufficient (≥ 0.70). We will drop item(s) if alpha is <0.70 and analyses indicate that dropping the item would increase alpha.

We will additionally examine the following secondary and other outcomes using the linear models specified in the first paragraph of Question 5 above: Secondary outcomes: attention, negative affect, cognitive elaboration, and anticipated social interactions; Other outcomes: PME for the non-focal behavior (e.g., PME for discouraging smoking in response to the vaping message), cognitive elaboration about the non-focal behavior, anticipated avoidance, reactance, perceived harm, and risk beliefs.

Exploratory analyses: To understand whether messages work better for particular groups, we will assess whether the following characteristics moderate the relationships between message elements and PME: frequency of Twitter use; political party identification; frequency of vaping; frequency of smoking; COVID affective reactions; COVID deaths per capita in respondents' state on day of survey launch; presence of any health condition considered high-risk for severe COVID infection (e.g., heart disease, type 2 diabetes, obesity); and educational attainment. We will test for moderation by adding interaction terms between the potential moderators and the experimental factors to the linear model described above.