# Method

## *Participants*

Participants were 412 students enrolled in Psychology 1000 at a Midwestern University. They were primarily white (76%), female (66%), and freshmen (74%); further demographic information can be found in [Table here]. Participants received course credit for participation in the study.

## *Procedure*

Participants were randomly assigned to one of two conditions representing different exposure to health benefits information. Our two conditions were an intervention (n=217) and control condition (n=195). conditionintervention condition; see Appendix [LETTER HERE] for Study 2 experimental materials. Study 2 used a 2 (pre-post) x 2(condition) mixed-subjects design, where condition was a between-subjects factor. Time was a within-subjects factor with the primary outcome, support for UHC, measured before and after participants completed the control or intervention condition.

## *Measures*

The primary outcome was the support for UHC scale, adapted from Shen & Labouff (2013), measured both pre and post-test. The items included in the scale were the same as in Study 1 (e.g. “Access to medical care and insurance is a basic, inherent right of man”). For Study 2, each item was measured on a 100-point sliding scale from 0 (strongly disagree) to 100 (strongly agree), instead of the 7 point Likert scale used in Study 1. ; see Table [LETTER HERE] for item wording.

Our secondary outcomes were our proposed mediating factors, perceived equality, and comprehensibility, measured both pre and post-test. Perceived equality was a single item measure adapted from Netemeyer, Boles, McKee, and McMurrian (1997) (‘Universal Health Care provides fair and equitable care to all US citizens, regardless of employment status’). The original item measured fairness in reward allocation, in an industrial/ organizational context relative to amount of responsibilities and work. Our adaptation inquires instead about the fairness in the reward analogue of universal healthcare, relative to type and/or amount of employment. Our measure of comprehensibility was adapted from the perceived complexity measure developed by Mulken, Pair, and Forceville (2010). This scale comprised of two items measuring comprehensibility, which are averaged together (‘Universal Health Care is straightforward, ‘Universal Health Care is easy to understand’). The original item measured perceived complexity and comprehensibility in an advertising context, operationalizing the terms by simply asking if the concept is straightforward to easy to understand. Cronbach’s alpha for the items in our measure of perceived complexity was 0.92.

Our moderating variables were subjective and objective numeracy. Objective numeracy was measured using the Rasch Numeracy Scale, created by Weller et al. (2013). This measure consists of 8 items, all math problems of varying complexity, requiring some amount of algebra, percentiles, and table reading skill (e.g. “If it takes five machines 5 minutes to make five widgets, how long would it take 100 machines to make 100 widgets?”). This measure was scored from 0 to 8, with the sum of all correct answers to the individual items as the subject’s objective numeracy score. The Cronbach’s alpha for these items is 0.71. Subjective numeracy was measured using the Subjective Numeracy Scale created by Fagerlin et al. (2007). This measure is an average eight items Likert-scale items that range from 1 (generally poor with numbers) to 7 (generally prefer numbers) (e.g. “How good are you at calculating a 15% tip?”). The Cronbach’s alpha for these items is 0.84. Additionally, we did not initially collect data on subjective and objective numeracy until part-way through the data collection. Thus, the first 68 subjects do not have this data recorded.

Participants were then asked whether they paid for their own health insurance and if they have been uninsured, and the active intervention condition was asked if they would be happy having the plan they built as their own health insurance. Each of these three items was measured as a ‘yes’ or ‘no’ response. Additionally, there was a free-response question asking about the subjects’ thoughts about the exercise they just completed. Finally, we also measured demographic information, including gender identity, age, race/ethnicity, and year in school.

## *Power and Statistical Analyses*

We planned to recruit 176 participants. Sample size was determined a-priori using G-power with the following parameters: greater than 90% power to determine a significant large-sized effect (Cohen’s *f* =0.10) at an alpha level of .05, for a linear multiple regression. Our support for UHC outcome was treated as a continuous variable. We examined the effects of experimental condition (intervention condition and control condition), time of intervention (pre vs. post), subjective numeracy, and objective numeracy on our outcome variable by conducting a series of analysis of variance tests. We examined the main effect and the 2-way interactions of condition x time, time x numeracy, and condition x numeracy of our four predictors. Additionally, we also tested models with random and fixed intercepts, with participants being treated as the random effect. Fixed effects comprised of the effect of the experimental condition and time of intervention (pre vs post). All tests were conducted in R and were considered statistically significant when *P* < .05. How to write about mediational tests?

## Study 2 Hypothesis:

Hypothesis 1 – Participants in the intervention condition will have greater increases in support for UHC compared to those in the control condition.

Hypothesis 2a – Differences in support for UHC due to our intervention are partially mediated through perceived equity.

Hypothesis 2b – Differences in support for UHC due to our intervention are partially mediated through comprehensibility.

Hypothesis 3 – Differences in support for UHC due to experimental group assignment are moderated by subjective numeracy and objective numeracy.

# Results

Descriptive statistics are summarized in [Table here]. Hypothesis 1 was analyzed using a linear mixed model fitted to our support for UHC outcome measure. We did not observe a statistically significant linear main effect for our experimental intervention, *t* (410) = -1.55, *p* = .122. We did observe a statistically significant linear main effect of time, *t* (410) = 6.09, *p* < .001. Support for UHC increased 1.903 points from pre-intervention to post-intervention. We also saw a statistically significant two-way interaction between the linear effect of time and condition, *t*(410) = -4.662 ,*p* < .001. In opposition of H1, as illustrated in [Table of Means Here], the intervention condition reduces support for UHC as compared to our control condition. This was opposite to the effect we expected.

## *Proposed Mediational Effects*

Tingley et al., (2014) as well as Frazier & Tix (2004) describe the necessary procedures to test mediational hypothesis. For H2a, we posit that perceived equity as a mediating variable for the causal effect of our intervention condition on support for UHC. The initial step in fitting our mediation model is to have our measure of perceived equity modelled as a function of our intervention condition and all covariates. Next, we have our support for UHC outcome variable modelled as a function of our measure of perceived equity (the proposed mediator) and the same set of covariates we used in our previous step. Finally, we generate 1000 bootstrap simulations using a quasi-Bayesian monte-carlo method based on normal approximation to estimate the average causal mediational effects and average direct effects of perceived equity on support for UHC. In support of H2a, the effect of our explicit HBP on support for UHC was partially mediated via the perceived equality of the HBP. We observed a statistically significant effect of experimental condition on our proposed mediating variable, perceived equality, *t*(820) = -3.551 ,*p* < .001. Perceived equality decreased 10.49 points in our intervention condition compared to our control condition. Furthermore, we observed a statistically significant effect of perceived equality on our outcome variable, support for UHC, *t*(821) = 18.243 ,*p* < .001. Support for UHC increased by .424 points for every point of increase in perceived equality. After computing 1000 bootstrapped samples, our estimate for our indirect effect was -2.72 (95% CI = -4.43, -1.03), thus our estimated average causal mediation effect is significant (*p* = 0.002). In opposition to H2b, the effect of our explicit HBP on support for UHC was not mediated by the comprehensibility of the HBP. This is since we do not see a significant effect of experimental condition on our proposed mediating variable, comprehensibility, *t*(820) = -0.805 , *p* =0.421.

We chose to illustrate our proposed mediational relationship using a path diagram, as seen in [Figure here]. Again, in support of H1a, we see that there is a mediational relationship between condition and UHC through the effect of perceived equity. Increased perceived equity increases support for UHC, and the control condition both has greater support for UHC, as well as greater perceived equity.

## *Moderating Effect of Numeracy*

In partial opposition of H3, in [Table here], we see that there is no direct effect of subjective numeracy, ß = 1.784, *t*(624) = 1.551 ,*p* = .121, or significant interaction with experimental condition, ß = 1.411, *t*(624) = -0.867 ,*p* = .386, on support for UHC. Given the lack of direct effect and interaction, we were unable to find evidence of a moderating effect of subjective numeracy on support for UHC.

In partial support of H3, in [Table here], we see a direct effect of objective numeracy on support for UHC, ß = 1.43, *t* (684) = 2.904, *p* = 0.004. Support for UHC increases by 1.43 points for each point of increase on the Rasch Numeracy Scale. Furthermore, we also see a significant interaction between the effect of objective numeracy and the condition, ß = 2.78, *t* (624) = 3.99, *p* < .001. In our intervention condition, support for UHC increases by an additional 2.78 points for each point of increase on the Rasch Numeracy Scale. Objective, but not subjective, numeracy has a significant effect on support for UHC, with an even greater effect for subjects in our intervention condition.

## *Qualitative results*

Analyzing our free-response question, we found very similar responses to those in Study 1, but with some significant differences. Unlike Study 1, no participants reported difficulty with comprehending the new activity or confusion regarding the instructions and procedures.. Several participants however reported difficulty regarding the decision making required in the task itself. Some examples include:

“it was much more difficult than I thought it was going to be; I had to compromise points in some places to be able to get at least basic coverage in other areas”

“It’s hard for me to think about people having to pick and choose which parts of healthcare they’ll have access to when they’re all important. It makes me wish healthcare would be reformed for the good of everyone and not just those who can afford it.”

Additionally, replicating what we found in Study 1, 18.4% of intervention condition participants and 8.7% of control condition participants found the activity particularly interesting and fun. Given that the purpose of the intervention is to increase engagement, this is a positive outcome. An example of these responses:

“Interesting that my answers changed. I would be interested in seeing someone against Universal Health Care make a study, too.”

“Enjoyed it, overall I believe that there should be Universal Health Care, but I did not realize how complicated it was. This exercise showed me how complicated it will be if the US decides to go through with something like this.”