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Humane League Labs

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Goal

This study examined whether the kind of request a person receives to reduce their animal product consumption leads to different amounts of real change. Participants received a pamphlet that made one of four requests: to eat vegan, eat vegetarian, “eat less meat,” or “cut out or cut back on” meat and animal products (which we refer to here as a combination message). In addition, we included a control group that did not receive a booklet.

All participants completed a brief questionnaire about their diet before reading the pamphlet, a brief questionnaire on intent to change their diet after reading the pamphlet, and another brief questionnaire about their diet during a follow-up survey given two to four months after they received the booklet.

Methodology

Respondents were approached on college campuses and asked to fill out a short survey on how frequently they consume red meat, poultry, fish, eggs, and dairy products. After completing that initial survey, respondents were then presented with one of eight booklets, or with no booklet at all (control group). While all of the eight booklets discussed the cruelty of factory farming and the health benefits of removing animal products from one’s diet, two booklets used language that encouraged readers to eat “vegan,” two used language that encouraged readers to eat “vegetarian,” two used language that encouraged readers to “eat less meat,” and two used language that encouraged readers to “cut out or cut back on” meat and other animal products.

One booklet of each message type was four pages in length, and one booklet of each type was eight pages in length, in order to – as a separate research question – determine whether booklet length has an impact on the amount of diet change generated. Results on that question will be presented in a separate report.

A limited number of respondents were provided with one of four 16-page booklets (one for each of the four message types), but their data was excluded from this study due to the small number of respondents and their uneven distribution across the message types (most respondents who received a 16-page booklet received the version with “vegan” messaging).

After each respondent was provided with a booklet, they were told to read the booklet for as long or short of a time as they wanted. When they were done, respondents were then directed to fill out a second short survey on how they intended to change their consumption of these products over the next few months. Respondents were also required to provide their email address and phone number. A total of 1,594 respondents completed the two initial surveys.

Between two and fourth months after receiving the booklets, respondents were followed up with by email and asked to take a survey on how frequently they consumed red meat, poultry, fish, eggs, and dairy products. Those who did not respond were sent a second and then a third email requesting they fill out the survey. Those who never responded to emails were contacted by phone and, when reached, administered the survey over the phone. A total of 601 respondents completed the follow-up survey, and their data was analyzed for this study.
Analysis

Effect of Message on Frequency of Consumption of Animal Products

Of those who completed the follow up survey, 126 received the vegan message, 133 received the vegetarian message, 147 received the “eat less meat” message, and 129 received the combination “cut out or cut back on” meat and other animal products message. 57 did not receive any message (control participants).

9 people were followed-up but there was no data on which survey they received. There was a fair amount of missing data for dairy during at least one time point: vegan = 6, vegetarian = 4, control = 25 (first time point). There were also 9 participants for whom no survey code was recorded.

The following table represents the change in frequency of consumption for each product between the time the initial survey was taken (before being provided with a booklet) and the time the follow-up survey was taken (two to four months after receiving a booklet). Positive numbers indicate animal-friendly diet change, meaning a reduction in the frequency of consumption. The higher the numbers displayed below, the better the results.

Animal-Friendly Changes in Diet (positive numbers indicate a reduction in consumption)

<table>
<thead>
<tr>
<th></th>
<th>Red Meat</th>
<th>Poultry</th>
<th>Fish</th>
<th>Eggs</th>
<th>Dairy</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vegan</td>
<td>.18</td>
<td>.46</td>
<td>.18</td>
<td>-.24</td>
<td>-.37</td>
<td>.19</td>
</tr>
<tr>
<td>Vegetarian</td>
<td>-.22</td>
<td>.12</td>
<td>-.24</td>
<td>-.22</td>
<td>-.41</td>
<td>-.88</td>
</tr>
<tr>
<td>Less Meat</td>
<td>.50</td>
<td>.41</td>
<td>.19</td>
<td>-.01</td>
<td>.27</td>
<td>1.33</td>
</tr>
<tr>
<td>Combination</td>
<td>.70</td>
<td>.80</td>
<td>.13</td>
<td>.43</td>
<td>.57</td>
<td>2.44</td>
</tr>
<tr>
<td>Control</td>
<td>.95</td>
<td>1.12</td>
<td>-.02</td>
<td>.16</td>
<td>1.06*</td>
<td>4.25</td>
</tr>
</tbody>
</table>

*missing data from 25 participants

In order to assess whether the type of request affected diet change, we conducted one-way Analyses of Variance for each change index (i.e., change in red meat, poultry, fish, eggs, dairy and total change).

Only the ANOVA with “total change” as the dependent variable was significant, $F(4, 548) = 3.01, p = .018$. The ANOVA with red meat as the dependent measure was marginally significant, $F(4, 586) = 2.31, p = .056$, but given the number of comparisons, this should be interpreted conservatively since it is quite possible this result occurred by chance. Correcting for multiple comparisons (which increase the Type I error rate/risk of a false positive), this result is no longer significant.

Inspection of the post-hoc t-tests confirmed that there were no significant differences among any paired comparisons for the poultry, fish, dairy, and egg diet change variables.

Post-hoc t-test comparisons indicate that the vegan message was less effective than the control message ($p = .037$) at getting people to reduce overall animal product consumption. The vegetarian message was less effective than the combination message ($p = .007$) and the control message ($p = .008$). There was a non-significant trend such that the vegan message was less effective than the combination message ($p = .071$). There was also a non-significant trend such that the vegetarian message was less effective than the eat less meat message ($p = .062$). All other differences were not
in the ballpark of significance and could be due to chance and therefore should not be interpreted or used to guide decisions about booklet design.

Post-hoc t-test comparisons indicate that the vegetarian request was less effective than the less meat message at getting people to change their red meat consumption ($p = .05$; although). It was also less effective than the combination ($p = .02$) and control ($p = .02$) requests.

We conducted one additional exploratory analysis in which our measure of change reflected only fish, egg, and poultry consumption. Our rationale for this was that consumption of these animal products is associated with a disproportionate amount of animal suffering relative to other categories (dairy and red meat) and thus it is useful to know whether the kind of message an individual receives might affect reduction across these categories. We conducted a one-way ANOVA with message type as the between-subjects variable and total change for fish, eggs, and poultry (summing change across these categories) as our dependent variable. The ANOVA was not significant, which indicates that between groups variance was not greater than within group variance, and thus that any observed differences across message categories (given a lack of a priori hypotheses) are unlikely to be reliable.

The lack of findings here does not necessarily indicate a lack of effect but could be the result of lower power due to a less sensitive dependent variable (only summing across three of the five product categories).

**Comparing Change Observed in Each Message Group to Zero Change**

Another way of analyzing this data is to look at how much people changed in each message group, and whether this differed significantly from zero change. This is less informative than the above analyses because zero change is not realistic (hence the need for a control group).

With that caveat in mind, the combination message generated change that differed significantly from zero on total change, red meat, and poultry, $p < .02$. The eat less meat message was associated with change that differed from zero in the red meat category only, $p = .023$. The control message also was associated with change across red meat and poultry, $p < .02$. Change in the vegan and vegetarian categories did not significantly differ from zero on any of the measures of change.

**Days Of Animal Suffering Spared For Each Message Group**

Next, we computed a single value representing the net benefit to animals corresponding to respondents’ change in eating habits across the questions about each category of animal product. Given background knowledge about how much meat, eggs, and dairy the average American eats per year, we can make educated guesses about the number of days of suffering prevented by a given % reduction in consumption. For example, the average American eats enough chicken to cause approximately 1220 days of suffering (i.e., days of life that a chicken must lead in misery being raised for meat). If an individual reduced their chicken consumption by 10%, then we can extrapolate that this will spare about 122 days of suffering on the part of chickens.

Days of suffering experienced by animals per year were estimated as follows:

- Fish: 1500
- Chicken: 1220
- Eggs: 365
- Red Meat: 113
- Dairy: 12
The chart below reflects the percentage changes (from baseline, calculated by averaging consumption across all respondents who completed the follow-up survey) for each product category, and the net number of animals spared for each message.

Statistical significance has not been calculated for any of the numbers below, and these numbers should not be relied upon as an indicator of the effectiveness of each message type. Calculations of significance from the previous sections should be relied upon for determining what if any statistically significant (or trending significant) differences exist for the impact of each message type.

**Percentage reductions, and number of days of farm animal suffering spared (positive numbers indicate a reduction in consumption)**

<table>
<thead>
<tr>
<th></th>
<th>Red Meat</th>
<th>Poultry</th>
<th>Fish</th>
<th>Eggs</th>
<th>Dairy</th>
<th>Days of Suffering Spared</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vegan</td>
<td>4.8%</td>
<td>9.2%</td>
<td>8.8%</td>
<td>-5.6%</td>
<td>-5.2%</td>
<td>228</td>
</tr>
<tr>
<td>Vegetarian</td>
<td>-5.9%</td>
<td>2.4%</td>
<td>-11.7%</td>
<td>-5.1%</td>
<td>-5.7%</td>
<td>173</td>
</tr>
<tr>
<td>Less Meat</td>
<td>13.4%</td>
<td>8.2%</td>
<td>9.3%</td>
<td>-0.2%</td>
<td>3.8%</td>
<td>254</td>
</tr>
<tr>
<td>Combination</td>
<td>18.7%</td>
<td>15.9%</td>
<td>6.4%</td>
<td>10.0%</td>
<td>8.0%</td>
<td>348</td>
</tr>
<tr>
<td>Control</td>
<td>25.4%</td>
<td>22.3%</td>
<td>-1.0%</td>
<td>3.7%</td>
<td>•</td>
<td>14.8%* 302</td>
</tr>
</tbody>
</table>

*missing data from 25 participants

**Limitations and Caveats**

The number of control participants for whom there was follow-up data was very small (n = 57). Of these respondents, there were missing data for initial dairy consumption. It is unclear whether these data were missing due to a data entry error or respondent omission.

The small control sample is a problem because small samples are less likely to approximate the population value (more error in the estimates). There is evidence of that in this case because the variance is higher for this group than the other groups, which means the data are more spread out/variable. This is reduced with larger samples. In short, because the sample is smaller, the data are less reliable.

This is important to note because the control group actually showed the greatest amount of positive change across animal product categories (meaning, the largest apparent reduction in consumption). There are a few possible explanations for this. First, the finding is due to sampling error and the small sample size and does not accurately reflect the amount of change we would see in the population at large if they did not receive a booklet. Second, it is possible that the intervention inadvertently adjusted the accuracy of reporting on product consumption, such that those who received the intervention became more accurate that the control group in reporting how frequently they consumed animal products (adjusting their estimates upward from the control group; prior research suggests that the general public significantly underestimates its frequency of consumption of these products). A third possibility is that just reflecting on one’s diet leads to a large amount of positive change, but this seems quite unlikely. Future studies should consider these issues when using
control groups. For example, if individuals administering the survey are easily identifiable as animal advocates, this could bias participants’ responses.

The dependent variables used in the analyses were change scores computed from participants’ responses to questions about their diet. Participants were asked about their current diet, by animal product category, and asked the same questions 2 to 4 months later. Sometimes participants indicated a range for a given category (e.g., indicating they eat red meat at 2 to 4 meals a week). In such cases, the higher end of the range was taken as their response in order to make possible parametric analyses. Another issue was that participants had the option of indicating that they ate some product “15+” times per week. Unfortunately, a range of values could fit under this one, but for the sake of straightforward parametric analysis, this response was interpreted as “15” in all cases.

There is also a fair amount of missing data, notably 25 missing data points for current dairy consumption for the controls. This is a problem because in order to get more power for the analyses, it is useful to be able to collapse across animal product types and generate a “total change” score, which we cannot do if some of the data are missing.

Finally, the overall sample of respondents who were successfully followed up is small and potentially vulnerable to sampling bias.

Conclusions

The data from the current study suggest that the combination message of “cut out or cut back on” meat and other animal products may be the most effective approach for getting people to reduce animal product consumption across categories. However, we also found that the control group which did not receive any messages changed its meat consumption the most, which is unexpected and counter-intuitive. The report makes an attempt to offer explanations but additional studies will be required to ascertain what aspect of the methodology may have skewed the control group results in this way. Therefore, pending further studies, we consider the conclusion of this report to be tentative. In the interest of full transparency and in order to inform the design of future studies, we report the results in full despite the tentative nature of the conclusions of this study.