The Effects of Dynamic Norms on Behavior Change:

A Direct Replication of Sparkman & Walton (2017)

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Abstract

Conformity to social norms has been well established in previous studies, but there is emerging research into the effects of static and dynamic norms. We attempted to replicate a recent key study in this field: the Sparkman and Walton (2017) study, which investigates social norms and their effect on reducing meat consumption. To 193 American adults, we either presented a static or dynamic norm statement about meat consumption and then asked them to report their interest in reducing meat consumption. While we hypothesized that people will express more interest in eating less meat in the dynamic norm condition, our results did not show a significant difference between the two conditions. This null result may be due to a weak manipulation of the norm conditions; participants may be more likely to skim over the norm statements in the online setting. Future studies can measure the length of time participants read the norm statements, or investigate another habit related to sustainability. The results of these studies can be helpful to promoting social change, by altering the framing of public health messages.

The Effects of Dynamic Norms on Behavior Change:

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Human beings are inherently social creatures. In most situations, people will change their behavior in order to fit in with the expected norm. Over time, social norms have developed to benefit the collective group rather than the individual (van Kleef, Gelfand, & Jetten, 2019), as well as give rise to predictability and order within society. However, these social norms do not always lead to society's benefit. As seen in the Western diet, meat is largely accepted despite healthcare providers emphasizing the negative effects of its production and consumption (Cass 2015). Reducing the amount of meat the average person consumes could drastically decrease the amount of food-related agricultural gas emissions of methane that is released into the environment (Hedenus, Wirsenius, & Johansson, 2014). In order to prevent further environmental harm, there must be a large behavioral shift in accepted societal norms and behavior, and studying the underlying processes that affect social norms is the first step to achieve this change. Sparkman and Walton found that dynamic norms were more effective in reducing people's meat consumption than static norms. This experimental study aims to extend the currently developing research into static and dynamic norms, by replicating the original Sparkman and Walton (2017) study.

Previous research involving social norms have suggested that norms can influence an individual's behavior in all aspects of life. In an academic setting, students who are told that other classmates are studying are then more likely to study and experience higher learning outcomes and knowledge retention (Eyink, Motz, Heltzel & Liddell, 2020). In the home setting, people are more likely to adjust their behavior and conserve household energy if their neighbors

also conserve household energy (Bergquist & Nilsson, 2018). In a cafeteria setting, people are more likely to select the healthier food option when exposed to signs describing the healthy behavior of other people, rather than signs that explicitly suggest to eat healthy (Mollen, Rimal, Ruiter, & Kok, 2013).

There are also other studies suggesting the impact of social norms on people's behavior, specifically for eating behaviors. The amount of food people eat is influenced by their perception of socially acceptable amounts, and if they are around people who eat a larger amount of food, then they are more likely to eat more food as well (Robinson, Benwell, & Higgs, 2013). This effect also applies to snacking throughout the day, with increased rates of snacking in the presence of people who snack more often (Schüz, Papadakis, & Ferguson, 2018). These social norms relating to food intake are especially prevalent in the United States, where a majority of people are obese and it's socially acceptable for restaurants to serve large portion sizes. Research into food-related behavior can reveal valuable insights for people who aim to shift to a healthier diet, and on a larger scale, can help improve the overall health of the community. The preliminary step to achieve this change is understanding how social norms shift over time.

Recently studies have started to investigate the concept of dynamic and static norms. These norms relate to the temporal nature of social norms, with dynamic norms capturing how social norms change over time. Conversely, static norms refer to the current state of an existing norm. Studies have shown that dynamic norms can motivate change, increasing interest in eating less meat, which is a counter normative behavior (Sparkman & Walton 2017). Other studies have also found that dynamic norms can cause customers in a cafe to switch to using a reusable mug instead of using to-go-cups (Loschelder, Siepelmeyer, Fischer, & Rubel, 2019). Compared to static norms, dynamic norms appear to have a greater influence on changing people's behavior.

The power of dynamic norms signifies that when people perceive an ongoing shift in public behavior, they are then more likely to change their own behavior to fit with the shifting societal norm.

The original Sparkman and Walton (2017) study investigated counter normative behaviors in the context of meat consumption. The researchers hypothesized that the factors of pre-conformity and perceived importance to other people will affect the results of their study. Their method of data collection relied on recruitment through Amazon's Mechanical Turk (MTurk), and participants were either exposed to a statement that described a static norm, stating the current percentage of Americans who try to reduce their meat consumption, or a dynamic norm, stating the trend of Americans who try to reduce their meat consumption over the last 5 years (Sparkman & Walton 2017). The results supported the researchers hypothesis: those in the dynamic norm condition expressed more interest in reducing meat than those in the static norm condition.

This paper details the direct replication of the Sparkman and Walton (2017) study. Researchers are often pressured to produce novel findings, so replications are often overlooked, even though replications are an essential part of validating scientific research. This is known as the "Replication Crisis," and researchers have found that only 39% of replications are successful in reproducing the findings of the original study. Given the fact that most people regard science as truth, researchers should strive to ensure that previous studies are valid --- replications are a key part to validating previous studies. Thus, our replication study of Sparkman and Walton (2019) adds to the Collaborative Replication and Education Project (CREP), which promotes student involvement in scientific studies and aims to fill the need for replicability within existing scientific literature. Furthermore, the findings from the Sparkman and Walton (2017) study is

significant in the framing of public health messages and promoting environmentally friendly behavior.

As a direct replication of the Sparkman and Walton (2017) study, our results will either support or discredit the findings from the original study. Given the existing scientific literature and the study's original findings, I believe that people will generally try to fit in with the perceived shift in social norms. Thus, when participants are presented with a dynamic norm, they should express more interest in reducing meat consumption than individuals who are presented with the static norm. If people are truly more affected by dynamic norms, this would be useful for public health messages promoting sustainable behavior and other behavioral changes.

Methods

Design

Our experiment follows the design of the original Sparkman and Walton (2017) study. As a between-subjects study, participants are exposed to either the static norm condition or dynamic norm condition. Our independent variable is the type of social norm while our measured independent variable is the participants' interest in reducing meat consumption.

Participants

Through the recruitment website Prolific, we obtained a convenience sample of 200 adults in the United States, who all received $1.50 as compensation. To be eligible for the experiment, participants cannot be vegan or vegetarian and cannot have participated in the research previously. People who are vegan or vegetarian have already eliminated all meat consumption, so their results would be inherently different. Furthermore, people who have already participated in this research would not be blind to the social norm variables, potentially

affecting their responses. Thus, after excluding four people who were vegan or vegetarian and three people who had already participated in this research, our study had a total of 193 participants in the final sample.

We collected demographic information from the participants, such as their gender identity, racial/ethnic identity, age, and political ideology. Our sample's gender identities are as follows: 48.79% male, 48.19% female, and 0.52% nonbinary, with the remaining 2.59% declining to answer. The racial and ethnic identities are as follows: 63.73% White/European, 13.99% Asian, 8.29% Black/African, 5.70% Latino/a/x, and 5.70% Multiracial, with the remaining 2.59% declining to answer. The average age of our sample was 31.49 years (SD = 10.30), and the mean political orientation was 3.26 (SD = 1.65). Since the political orientation was measured on a 1 to 7 scale of very liberal to very conservative, our sample mean is close to moderate, with a slight lean towards the liberal side.

Materials

Preliminary questions

We asked participants if they were at least 18 years old, whether or not they have participated in this research before, and whether or not they are located in the United States. For all of these questions, participants can choose from Yes, No, or Decline to answer.

Demographics

We asked participants to report the following demographic information. For all of these questions, participants are given the option to decline to answer.

Age. Participants were asked to select their age in years from a dropdown menu.

Race. Participants were asked to type in the word or phrase that best describes their racial and/or ethnic identity. This allows for diverse answers, as participants won't be confined to pick from a set list of options.

Gender Identity. Participants were asked to type in the word or phrase that best describes their gender identity. This allows for accurate answers, as participants won't be confined to pick from a set list of options.

Political ideology. Participants were asked to select the word or phrase that best represents their political orientation, with options spanning from very liberal to very conservative. These were then codified into a 1 to 7 scale, with 1 being very liberal and 7 being very conservative.

Independent variable

Social norm manipulation. Participants were randomly assigned to a dynamic norm or a static norm condition. The initial random assignment ensures that each participant has an equal chance to be part of either norm condition, so that any differences between responses to the dependent variables are due to the social norm manipulation. In the static norm condition, participants received this prompt:

> "Recent research has shown that 30% of Americans make an effort to limit their meat consumption. That means that 3 in 10 people eat less meat than they otherwise would."

In the dynamic norm condition, participants received this prompt:

> "Recent research has shown that, in the last 5 years, 30% of Americans have now started to make an effort to limit their meat consumption. That means that, in recent years, 3 in 10 people have changed their behavior and begun to eat less meat than they otherwise would."

While both statements convey that 30% of Americans currently reduce their meat consumption, they emphasize different aspects of the social norm status. The static norm focuses on the *current* percentage of people reducing their meat consumption, while the dynamic norm highlights the *change* in percentage over time; more people are changing their behavior and are actively trying to eat less meat. While this difference may seem slight, this is the crux of our experimental study, and the norm condition that participants experience should affect the measured dependent variables described below.

Dependent variables

Interest in reducing meat consumption. Participants were presented with a Likert scale to rate their own interest in reducing meat consumption (1 = not at all, 4 = somewhat, 7 = extremely).

Perceptions of other reducing meat consumption. Participants were presented with three questions about their perceptions of other people reducing meat consumption. After informing participants that most people eat 3 meals per day and 21 meals per week, we asked participants to estimate the number of meals that are meatless for people who actively make an effort to eat less meat. We also asked participants to estimate the percentage of people who try to limit their meat consumption. Lastly, we asked participants to briefly explain the reasoning behind people reducing their meat consumption.

Procedure

Participants reviewed our consent and eligibility form, which included a brief description on the topic of our experimental study. Participants who agreed to participate were prompted with the preliminary questions. Then, they were randomly assigned to our social norm manipulation which included either a dynamic or static norm prompt. After reading the social

norm statistics, participants were asked for their own interest in eating less meat and for their perceptions of others reducing their meat consumption. Next, participants provided their demographic information, such as political ideology, gender identity, vegan/vegetarian status, age, and race/ethnicity. Afterwards, they were debriefed on the specific details and social norm aspects of our study and had the opportunity to exclude their data.

Statement of Transparency

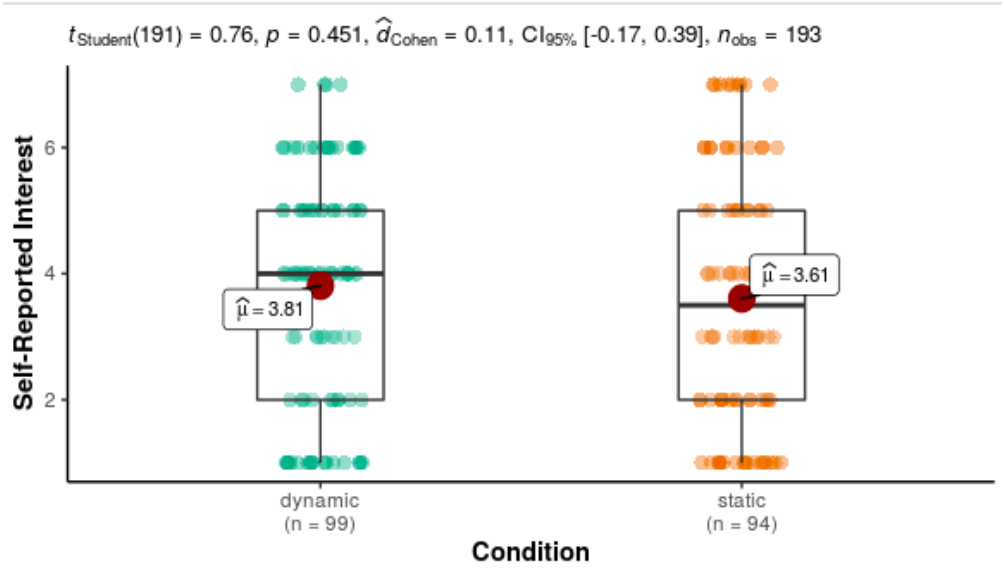
Our research was pre-registered; all data, code, and materials can be found on our OSF project, which is accessible through this link: https://osf.io/43mz7/. Through this, I have reported how I determined the sample size, all data exclusions (if any), all manipulations, and all measures in the study.

Results

Overall, the participants in our sample were somewhat interested in reducing their meat consumption ($M = 3.71$, $SD = 1.85$). As displayed in Figure 1, the participants in the dynamic condition ($M = 3.81$, $SD = 1.76$) were slightly more interested than the static condition ($M = 3.61$, $SD = 1.95$).

Figure 1

Self reported interest in meat consumption across dynamic and static norm conditions



Note: Box and whisker plots to show that participants in the dynamic norm condition were marginally more interested in reducing their meat consumption.

We conducted a two tailed t-test to analyze the relationship between interest in reducing meat consumption and social norm statements. Contrary to our expectations, we did not find a significant difference in reducing meat consumption across the two groups, $t(191) = 0.76$, $p = 0.451$, $d = 0.11$. While the dynamic group was slightly more interested than the static group, it was not different by a significant amount. Since our p-value was less than 0.05 and Cohen's d was very small, there does not appear to be evidence to support our hypothesis of social norm conditions affecting interest in reducing meat consumption.

Discussion

We conducted a direct replication of the Sparkman and Walton (2017) study to gain a better understanding of normative influence on an individual's behavior. Specifically, we investigated the effect of dynamic and static norm statements on interest in reducing meat consumption. Based on existing literature of social norms and the results of the original

Sparkman and Walton (2017) study, our hypothesis was that dynamic norms would significantly increase people's interest in reducing meat consumption as compared to static norms. Interestingly, the results of our present study do not support this hypothesis; there was not a significant difference of reducing meat consumption in the static and dynamic norm conditions.

This contrasts with the existing research into dynamic norms, which suggest that dynamic norms have a greater influence in changing people's behavior. Studies have shown that dynamic norms can cause people to use sustainable reusable mugs (Loschelder, Siepelmeyer, Fischer, & Rubel, 2019), increase people's water conservation (Mortensen, et. al, 2019), and promote environmental conservation in hotels (Goldstein, Cialdini, & Griskevicius 2008). However, despite these findings, most of the literature out there does not fixate on dynamic norms in relation to static norms. Previous studies have investigated the effects of social norms when compared to a control, and have found markedly significant outcomes in learning outcomes (Eyink, Motz, Heltzel & Liddell, 2020) and healthy eating behaviors (Mollen, Rimal, Ruiter, & Kok, 2013). However, while these studies establish the effects of dynamic norms on changing human behavior, they have not investigated into comparing the effects of static norms in relation to dynamic norms. Additionally, while the original Sparkman and Walton did establish a significant difference between dynamic and static norm conditions, the threshold for statistical significance was barely met. Thus, either there was a weak manipulation in social norm statements or there truly is no difference in effects between dynamic and static norm statements in reducing meat consumption.

A likely explanation for the null results is the weak manipulation of the independent variable, as participants may not have fully read the social norm statement. The social norm statements were very similarly worded, so it is likely that people did not process or notice the

slight differences in wording, only retaining the "3 in 10 people," part of the social norm statements, rather than the other differences of the social norm statement. Furthermore, the online format of the survey on Prolific may increase the likelihood of "skimming, keyword spotting, and reading selectively" (Liu, 2005). Unfortunately, we did not measure how long people read the social norm statements, nor did we provide attention checks to ensure that people understood the implications of the social norm statements. Another possible explanation for the null results is the saliency of the social norm of meat eating. When asked for their interest in reducing meat consumption, most people answered with a 3 or 4, which is in the middle of our 1 to 7 scale.

Strengths

Participants were randomly assigned to the two norm conditions, which contributed to the study's internal validity and reduced selection effects. Ideally, the participants in the two conditions should be similar in every other aspect. To check for these potential differences, we asked participants to also report on their age, gender identity, political ideology, and Race/ethnicity, and performed multiple regression analyses on these potential third variables. In addition to asking participants about their own interest in reducing meat consumption, we asked about their perceptions of others reducing their meat consumption. This question functioned both as an attention check and as an evaluator of participant belief in the social norm statistic provided earlier in the survey. Furthermore, our dependent variable of interest in reducing meat consumption was measured accurately and consistently, and our results do have statistical validity, even though our p-value indicates that the difference between the group means is not statistically significant.

Limitations

There are various limitations concerning the results of this study. Broadly speaking, we wanted to study the effects of social norms on an individual's behavior, but our present study only measured an individual's interest in reducing meat consumption -- an individual's interest does not necessarily translate into performing the action. Similarly, inattentiveness may have affected the accuracy of our results, as participants are not retaining the subtle differences between the static and dynamic norms (Liu, 2005). People who are more attentive tend to be "more conscientious, agreeable, and open to experiences," which are all alternative variables that could explain the data (Liu, 2005).

Generalizability of the results may be another potential limitation of the present study. . Recall that our sample consisted of majority white and young people, with only 33.68% non-white participants, all from the United States. Obtaining a more diverse sample of participants can reveal the effects of cultural and social factors on meat consumption. For instance, aggregate data from various countries has shown that African, Middle Eastern, and Asian countries consume significantly less meat than North American countries (Miford, 2019). While we are primarily focused on the United States, with a larger, more diverse sample of participants, more cultural backgrounds can be represented. Also, our participants tended to be young, which is less reflective of views of the older population.

Future directions

Beyond the current study, future research could extend these findings by examining the ease of accessing meatless options. Studies have shown that in the presence of barriers to change, people are less likely to deviate from their regular behavior, in the context of pro-environmental actions (Semenza, 2008). Specifically, the lack of interest in reducing meat consumption could

be attributed to the perceived difficulty in accessing meatless options. Furthermore, one of these barriers to change could be socio-economic background. As healthy and organic foods tend to be more expensive (Kern 2016), many people who are economically disadvantaged might be deterred from these food options, opting for the cheaper, less healthy alternatives.

Social norms can be studied in various other contexts besides meat consumption levels. For instance, future studies investigate the expected social norm of mask wearing. In the age of the COVID-19 pandemic, people in the United States are resistant to wearing masks, even though state officials have mandated that mask wearing is a requirement by law (Tobol, Siniver, & Yaniv, 2020). As the COVID-19 virus drastically affects daily life in the 2020s, people might have stronger opinions on this issue, as compared to their meat consumption levels. Studying behavioral change in this context is essential to reducing the spread of the virus, further reducing the amount of unnecessary deaths around the world.

Conclusion

If, as our present study suggests, dynamic norm statements do not have a significant impact in promoting sustainable behavior over static norm statements, then there is a need for research that explores other ways to operationalize social norm statements to study behavioral change further. Similarly, there is a need for research into other methods to promote sustainable behavioral change. Understanding the underlying processes that lead to behavioral change is the first step towards a more sustainable and healthy world.

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