Replication of a Research Claim from LeBoeuf & Simmons (2010),
from The Journal of Marketing Research

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Independent Reviewers
(add name below when you initiate review, comment “DONE” on your name when you finish):

Reviewer #1: [Ignazio Ziano]

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Review Period: Feb. 17 - Feb. 24

View-only links to: Original Paper, Original Materials

Note to Reviewers: Going forward, we will be implementing a new preregistration form. Please reference the New Preregistration Form and the Reviewer Criteria Checklist for instructions and specific criteria to help guide your review.

Privacy Statement: Other teams are making predictions about the outcomes of many different studies, not knowing which studies have been selected for replication. As a consequence, the success of this project requires full confidentiality of this peer review process. This includes privacy about which studies have been selected for replication and all aspects of the discussion about these replication designs.

You can find the new template here

General information about preregistration is available at https://cos.io/prereg and you can reach out to the SCORE coordinators at scorecoordinator@cos.io or make a comment in the document for additional assistance.

Sourcing Notes

- The authors have provided a number of materials to aid in the replication attempt. There are links in the relevant sections below, but briefly:
  - A document with the study description, variable descriptions, notes on the original analyses and results, and instructions for replicators.
    - **Note** that the corresponding author has suggested that anyone working on this project start with here for an overview.
  - The questionnaire provided to participants, with variations based on the different randomly assigned conditions.
  - Data from the original study.
  - R code to reproduce the analyses and figures in Study 1b.
- To follow the original study as closely as possible, collecting data on a new sample of undergraduate participants is recommended.
- The original study (Study 1b) was a part of a larger laboratory session with other unrelated tasks before and after. Those other tasks in the original study were unrelated tasks, thus a replication study narrowly focused on the protocol described in Study 1b should work fine.

Study Information

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1. Title

   1.1. Provide the working title of your study. It may be the same title that you submit for publication of your final manuscript, but it is not a requirement.

   1.2. ***Example****: Effect of sugar on brownie tastiness.*

   1.3. ***More info****: The title should be a specific and informative description of a project. Vague titles such as 'Fruit fly preregistration plan' are not appropriate.*

TITLE: Direct replication of a research claim from LeBoeuf & Simmons (2010), in Journal of Marketing Research

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2. Authors (required)

AUTHORS:

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3. Description

3.1. Please give a brief description of your study, including some background, the purpose of the of the study, or broad research questions.

*3.2. **Example**: Though there is strong evidence to suggest that sugar affects taste preferences, the effect has never been demonstrated in brownies. Therefore, we will measure taste preference for four different levels of sugar concentration in a standard brownie recipe to determine if the effect exists in this pastry.*

*3.3. **More info**: The description should be no longer than the length of an abstract. It can give some context for the proposed study, but great detail is not needed here for your preregistration.*

DESCRIPTION:

LeBoeuf & Simmons (2010) has shown that products predominantly associated with utilitarian attitudes at the category level support less utilitarian and more symbolic attitudes at the brand level and products predominantly associated with symbolic attitudes at the category level support less symbolic and more utilitarian attitudes at the brand level. The current research aims to test the robustness and replicability of this finding with a larger new sample.

The claim selected from LeBoeuf et al. (2010) is that products predominantly associated with utilitarian attitudes at the category level support less utilitarian and more symbolic attitudes at the brand level. Products predominantly associated with symbolic attitudes at the category level support less symbolic and more utilitarian attitudes at the brand level (H1). This reflects the following statement from the paper's abstract: “Specifically, product categories that are generally associated with utilitarian attitudes are associated with less utilitarian, more symbolic attitudes when branded, whereas product categories that are generally associated with symbolic attitudes are associated with more utilitarian, less symbolic attitudes when branded.” To test the claim, participants evaluated eight products (four utilitarian products and four symbolic products), with product order counterbalanced and symbolic and utilitarian products intermixed. The authors randomly assigned participants to evaluate branded or unbranded products, and they further randomly assigned those evaluating branded products to one of two sets of brand names. Participants rated each product’s associations with symbols and benefits, and the authors obtain difference scores by subtracting each product’s symbolism rating from its benefits rating, revealing the degree to which each product supports, on balance, more utilitarian (higher numbers) or more symbolic (lower numbers) attitudes. The authors perform a 2 (level: category or brand) × 2 (unbranded product type: utilitarian or symbolic) mixed ANOVA on the difference scores (averaged for each product type). A 2 (level:

category or brand) × 2 (unbranded product type: utilitarian or symbolic) mixed ANOVA on the difference scores (averaged for each product type) revealed the predicted level × product type interaction (F(1, 204) = 7.70, p = 0.006).

4. Hypotheses

    4.1. List specific, concise, and testable hypotheses. Please state if the hypotheses are directional or non-directional. If directional, state the direction. A predicted effect is also appropriate here. If a specific interaction or moderation is important to your research, you can list that as a separate hypothesis.

    4.2. ***Example****: If taste affects preference, then mean preference indices will be higher with higher concentrations of sugar.*

HYPOTHESIS: There will be a level (category (no brand) vs. brand; between-participant factor) x product type (utilitarian vs. symbolic; within-participant factor) interaction (the interaction between level and product type is a mixed interaction) for the difference scores outcome (utilitarian rating – symbolic rating).

Design Plan

In this section, you will be asked to describe the overall design of your study. Remember that this research plan is designed to register a single study, so if you have multiple experimental designs, please complete a separate preregistration.

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5. *Study type*

    5.1. Experiment - A researcher randomly assigns treatments to study subjects, this includes field or lab experiments. This is also known as an intervention experiment and includes randomized controlled trials.

    5.2. Observational Study - Data is collected from study subjects that are not randomly assigned to a treatment. This includes surveys, natural experiments, and regression discontinuity designs.

    5.3. Meta-Analysis - A systematic review of published studies.

    5.4. Other

STUDY TYPE: Experimental study

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6. Blinding (required)

6.1. Blinding describes who is aware of the experimental manipulations within a study. Mark all that apply.

6.1.1. No blinding is involved in this study.

6.1.2. For studies that involve human subjects, they will not know the treatment group to which they have been assigned.

6.1.3. Personnel who interact directly with the study subjects (either human or non-human subjects) will not be aware of the assigned treatments. (Commonly known as "double blind")

6.1.4. Personnel who analyze the data collected from the study are not aware of the treatment applied to any given group.

7. Is there any additional blinding in this study?

BLINDING: With respect to the research hypothesis, participants will not be aware of the hypothesis of the study, whereas the experimenter will be aware of the study hypothesis. In terms of treatment conditions, both participants and the experimenter will not be aware of the assigned treatments. Participants will be randomly assigned into either "Brand" condition or "No Brand (category)" conditions, and the "Brand" condition will also be randomly given one of two sets of brand names. Experiment materials will be randomly distributed, thus the experimenter also will not be aware of the assigned treatments.

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8. Study design

8.1. Describe your study design. Examples include two-group, factorial, randomized block, and repeated measures. Is it a between (unpaired), within-subject (paired), or mixed design? Describe any counterbalancing required. Typical study designs for observation studies include cohort, cross sectional, and case-control studies.

8.2. Example: We have a between subjects design with 1 factor (sugar by mass) with 4 levels.

8.3. More info: This question has a variety of possible answers. The key is for a researcher to be as detailed as is necessary given the specifics of their design. Be careful to determine if every parameter has been specified in the description of the study design. There may be some overlap between this question and the following questions. That is OK, as long as sufficient detail is given in one of the areas to provide all of the requested information. For example, if the study design describes a complete factorial, 2 X 3 design and the treatments and levels are specified previously, you do not have to repeat that information.

STUDY DESIGN: A 2 (levels: category (no brand) vs. brand; between-subject factor) X 2 (product type: utilitarian vs. symbolic; within-subject factor) mixed design will be used. For each

product type, there will be four different items, and for each item, two different brand names will be associated. Participants will be asked to evaluate their perception on 1) benefits and 2) symbolic aspects of each product using a 7-point scale.

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9. Randomization
    9.1. If you are doing a randomized study, how will you randomize, and at what level?
    9.2. Example: We will use block randomization, where each participant will be randomly assigned to one of the four equally sized, predetermined blocks. The random number list used to create these four blocks will be created using the web applications available at http://random.org.
    9.3. More info: Typical randomization techniques include: simple, block, stratified, and adaptive covariate randomization. If randomization is required for the study, the method should be specified here, not simply the source of random numbers.

RANDOMIZATION:

Participants will be randomly assigned into either “Brand” condition or “No Brand (category)” condition, and the “Brand” condition will also be randomly given one of two sets of brand names (Brand A or Brand B) using a simple randomization method. The study will be administered using Qualtrics, a software for online data collection. Participants will be randomly assigned into one of the three experimental conditions (No Brand vs. Brand A vs. Brand B) with a 50:25:25 ratio. Randomization will be conducted using the embedded randomization function in Qualtrics. The products and brand names that will be used in the study are presented in the table below.

	Item	Type	Brand A	Brand B
1	Paper Towels	Utilitarian	Brawny	Bounty
2	Toothpaste	Utilitarian	Crest	Colgate
3	Vitamins	Utilitarian	One-a-Day	Centrum
4	Cough Syrup	Utilitarian	Robitussin	Comtrex
5	College T-Shirts	Symbolic	Jerzees	Champion
6	American Flags	Symbolic	American Flags Express	FlagCo

7	Class Rings	Symbolic	Jostens	ArtCarved
8	Greeting Cards	Symbolic	American Greetings	Hallmark

Sampling Plan

In this section we'll ask you to describe how you plan to collect samples, as well as the number of samples you plan to collect and your rationale for this decision. Please keep in mind that the data described in this section should be the actual data used for analysis, so if you are using a subset of a larger dataset, please describe the subset that will actually be used in your study.

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10. Existing data (required; multiple choice, select one option)

    10.1. Preregistration is designed to make clear the distinction between confirmatory tests, specified prior to seeing the data, and exploratory analyses conducted after observing the data. Therefore, creating a research plan in which existing data will be used presents unique challenges. ***Please select the description that best describes your situation.*** *Please do not hesitate to contact us if you have questions about how to answer this question (prereg@cos.io).*

    10.1.1. Registration prior to creation of data: As of the date of submission of this research plan for preregistration, the data have not yet been collected, created, or realized.

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11. Explanation of existing data

    11.1. If you indicate that you will be using some data that already exist in this study, please describe the steps you have taken to assure that you are unaware of any patterns or summary statistics in the data. This may include an explanation of how access to the data has been limited, who has observed the data, or how you have avoided observing any analysis of the specific data you will use in your study.

    11.2. ***Example****: An appropriate instance of using existing data would be collecting a sample size much larger than is required for the study, using a small portion of it to conduct exploratory analysis, and then registering one particular analysis that showed promising results. After registration, conduct the specified*

analysis on that part of the dataset that had not been investigated by the researcher up to that point.

11.3. ***More info****: An appropriate instance of using existing data would be collecting a sample size much larger than is required for the study, using a small portion of it to conduct exploratory analysis, and then registering one particular analysis that showed promising results. After registration, conduct the specified analysis on that part of the dataset that had not been investigated by the researcher up to that point.*

EXPLANATION OF EXISTING DATA: N/A

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12. Data collection procedures

12.1. Please describe the process by which you will collect your data. If you are using human subjects, this should include the population from which you obtain subjects, recruitment efforts, payment for participation, how subjects will be selected for eligibility from the initial pool (e.g. inclusion and exclusion rules), and your study timeline. For studies that donÍt include human subjects, include information about how you will collect samples, duration of data gathering efforts, source or location of samples, or batch numbers you will use.

12.2. ***Example****: Participants will be recruited through advertisements at local pastry shops. Participants will be paid $10 for agreeing to participate (raised to $30 if our sample size is not reached within 15 days of beginning recruitment). Participants must be at least 18 years old and be able to eat the ingredients of the pastries.*

12.3. ***More information****: The answer to this question requires a specific set of instructions so that another person could repeat the data collection procedures and recreate the study population. Alternatively, if the study population would be unable to be reproduced because it relies on a specific set of circumstances unlikely to be recreated (e.g., a community of people from a specific time and location), the criteria and methods for creating the group and the rationale for this unique set of subjects should be clear.*

DATA COLLECTION PROCEDURES:

Undergraduate students over 18 years old at the University where the experimenter is currently affiliated will be recruited in exchange for class bonus points. The participation will be based on participants' voluntary participation.

Participants will be randomly assigned into either "Brand" or "No Brand (category)" conditions, and the "Brand" condition will have one of two sets of brand names. The products and brand names are presented in Section 9 (Randomization). The experiment will be administered online

using Qualtrics. Thus, participants will be randomly assigned into one of three experimental conditions: “Brand A”, “Brand B”, or “No Brand”.

For each item, participants will be asked to rate the degrees to which 1) the item (or item category) gives certain benefits (utilitarian benefits), 2) the item (or item category) symbolizes certain things, and 3) whether in general they think of the item (or item category) in terms of benefits or what it symbolizes using a 7-point scale. The order of items will be randomized by Qualtrics for each participant. After completing these ratings, participants will be asked to rate the familiarity of several market goods using a 7-point scale (a total of 24 items; the first eight items will be the same items used in the main task).

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13. Sample size

    13.1. Describe the sample size of your study. How many units will be analyzed in the study? This could be the number of people, birds, classrooms, plots, interactions, or countries included. If the units are not individuals, then describe the size requirements for each unit. If you are using a clustered or multilevel design, how many units are you collecting at each level of the analysis?

    *13.2. **Example**: Our target sample size is 280 participants. We will attempt to recruit up to 320, assuming that not all will complete the total task.*

    *13.3. **More information**: For some studies, this will simply be the number of samples or the number of clusters. For others, this could be an expected range, minimum, or maximum number.*

SAMPLE SIZE:

The initial target sample size is 500 participants. However, since the recruitment will be conducted at class level (i.e., multiple classes with different sizes), it is not easy to stop data collection at a certain number. So, the data collection will stop as soon as we exceed the target number. This may result in having more than the targeted number. If a subject does not complete any of the two rating questions (benefits and symbolism), the response for this item will be excluded in the data analysis. Also, if a participant does not complete the questions for all the four utilitarian or symbolic items, that subject will be excluded in the data analysis. If these exclusions result in having a sample smaller than the target number, additional data collection will be conducted. After achieving the target number of valid samples, planned analyses will be conducted. If a statistically significant effect is not observed after the first round of data collection, a second round will begin. The second round of data collection will sample an additional 618 participants for a pooled sample of 1118 participants.

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14. Sample size rationale

    14.1. This could include a power analysis or an arbitrary constraint such as time, money, or personnel.

    14.2. ***Example****: We used the software program G*Power to conduct a power analysis. Our goal was to obtain .95 power to detect a medium effect size of .25 at the standard .05 alpha error probability.*

    14.3. ***More information****: This gives you an opportunity to specifically state how the sample size will be determined. A wide range of possible answers is acceptable; remember that transparency is more important than principled justifications. If you state any reason for a sample size upfront, it is better than stating no reason and leaving the reader to "fill in the blanks." Acceptable rationales include: a power analysis, an arbitrary number of subjects, or a number based on time or monetary constraints.*

SAMPLE SIZE RATIONALE:

Power calculations were done in accordance with the guidelines of the Social Sciences Replication Project (SSRP). The first round of data collection achieves 90% power to detect 75% of the original effect size. The pooled sample, if necessary after testing the effect on the first round of data, achieves 90% power to detect 50% of the original effect size.

The power analysis was performed by the Center for Open Science SCORE team primarily using the G-Power program, following a specified procedure for a 2 x 2 ANOVA with one within-subjects factor and one between-subjects factor. The R markdown file that documents the procedure and a set of relevant screenshots from the G-Power analysis are contained here.

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15. Stopping rule

    15.1. If your data collection procedures do not give you full control over your exact sample size, specify how you will decide when to terminate your data collection.

    15.2. ***Example****: We will post participant sign-up slots by week on the preceding Friday night, with 20 spots posted per week. We will post 20 new slots each week if, on that Friday night, we are below 320 participants.*

    15.3. ***More information****: You may specify a stopping rule based on p-values only in the specific case of sequential analyses with pre-specified checkpoints, alphas levels, and stopping rules. Unacceptable rationales include stopping based on p-values if checkpoints and stopping rules are not specified. If you have control over your sample size, then including a stopping rule is not necessary, though it must be clear in this question or a previous question how an exact sample size is attained.*

STOPPING RULE:

The planned sample size is 500 participants. However, since the recruitment will be conducted at class level class (i.e., multiple classes with different sizes), it is not easy to stop data collection at a certain number. So, the data collection will stop as soon as we exceed the target number. If a participant does not complete any of the two rating questions (benefits and symbolism), the response for this item will be excluded in the data analysis. Also, if a participant does not complete the questions for all the four utilitarian or symbolic items, that participant will be excluded in the data analysis. If these exclusions result in having a sample smaller than the target number, additional data collection will be conducted until we have the target number of valid samples. After achieving that sample, planned analyses will be conducted. If a significant effect is found, sampling stops. If a significant effect is not found, a second round of data collection will collect data from 618 additional participants, for a pooled sample of 1118 participants. Sampling will stop after the second round of data collection regardless of a significant effect.

Variables

In this section you can describe all variables (both manipulated and measured variables) that will later be used in your confirmatory analysis plan. In your analysis plan, you will have the opportunity to describe how each variable will be used. If you have variables which you are measuring for exploratory analyses, you are not required to list them, though you are permitted to do so.

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16. Manipulated variables

    16.1. Describe all variables you plan to manipulate and the levels or treatment arms of each variable. This is not applicable to any observational study.

    16.2. ***Example:*** *We manipulated the percentage of sugar by mass added to brownies. The four levels of this categorical variable are: 15%, 20%, 25%, or 40% cane sugar by mass.*

    16.3. ***More information****: For any experimental manipulation, you should give a precise definition of each manipulated variable. This must include a precise description of the levels at which each variable will be set, or a specific definition for each categorical treatment. For example, "loud or quiet," should*

instead give either a precise decibel level or a means of recreating each level. 'Presence/absence' or 'positive/negative' is an acceptable description if the variable is precisely described.

MANIPULATED VARIABLES:

Only the variable “levels” (category (no brand) vs. brand; between-participant) manipulation is used as a variable in the focal analysis, but the “Brand” condition will have two brand name conditions (between-participant): Brand A and Brand B (in Section 9). These two sets of brand names are not the key manipulations of the study, but they will be maintained in the dataset.

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17. Measured variables

17.1. Describe each variable that you will measure. This will include outcome measures, as well as any predictors or covariates that you will measure. You do not need to include any variables that you plan on collecting if they are not going to be included in the confirmatory analyses of this study.

*17.2. **Example**: The single outcome variable will be the perceived tastiness of the single brownie each participant will eat. We will measure this by asking participants ‘How much did you enjoy eating the brownie’ (on a scale of 1-7, 1 being ‘not at all’, 7 being ‘a great deal’) and ‘How good did the brownie taste’ (on a scale of 1-7, 1 being ‘very bad’, 7 being ‘very good’).*

*17.3. **More information**: Observational studies and meta-analyses will include only measured variables. As with the previous questions, the answers here must be precise. For example, 'intelligence,' 'accuracy,' 'aggression,' and 'color' are too vague. Acceptable alternatives could be 'IQ as measured by Wechsler Adult Intelligence Scale' 'percent correct,' 'number of threat displays,' and 'percent reflectance at 400 nm.'*

MEASURED VARIABLES:

Participants will be given eight items (paper towels, college shirt, American flag, toothpaste, class ring, vitamins, cough syrup, and greeting cards) with randomizations of brand/no-brand and the two different brand name sets (Brand A vs. Brand B). For each item, they will be asked to rate the degrees to which they think each item or item category 1) gives certain benefits and 2) symbolizes certain things. We will measure these by asking ‘I typically think of [item] in terms of whether or not they give me certain benefits’ and ‘I typically think of [item] in terms of whether or not they symbolize certain things’ using a 7-point scale (“1” = generally disagree, “7” = generally agree). Since the study will be conducted in a different institute, the name of college shirt will be changed from “UF shirt” to “UD shirt”.

18. Indices

18.1. If any measurements are going to be combined into an index (or even a mean), what measures will you use and how will they be combined? Include either a formula or a precise description of your method. If your are using a more complicated statistical method to combine measures (e.g. a factor analysis), you can note that here but describe the exact method in the analysis plan section.

18.2.* Example: We will take the mean of the two questions above to create a single measure of 'brownie enjoyment.'*

18.3. ***More information****: If you are using multiple pieces of data to construct a single variable, how will this occur? Both the data that are included and the formula or weights for each measure must be specified. Standard summary statistics, such as "means" do not require a formula, though more complicated indices require either the exact formula or, if it is an established index in the field, the index must be unambiguously defined. For example, "biodiversity index" is too broad, whereas "Shannon's biodiversity index" is appropriate.*

INDICES:

The averaged score difference between benefits rating and symbolism rating (benefits rating – symbolism rating) by participant and product type (utilitarian vs. symbolic) will be used as a dependent variable.

Analysis Plan

You may describe one or more confirmatory analysis in this preregistration. Please remember that all analyses specified below must be reported in the final article, and any additional analyses must be noted as exploratory or hypothesis generating.

A confirmatory analysis plan must state up front which variables are predictors (independent) and which are the outcomes (dependent), otherwise it is an exploratory analysis. You are allowed to describe any exploratory work here, but a clear confirmatory analysis is required.

19. Statistical models (required)

19.1. What statistical model will you use to test each hypothesis? Please include the type of model (e.g. ANOVA, multiple regression, SEM, etc) and the specification of the model (this includes each variable that will be included as predictors, outcomes, or covariates). Please specify any interactions, subgroup analyses, pairwise or complex contrasts, or follow-up tests from omnibus tests. If you plan on using any positive controls, negative controls, or manipulation checks you may mention that here. Remember that any test not included here must be noted as an exploratory test in your final article.

***19.2. Example**: We will use a one-way between subjects ANOVA to analyze our results. The manipulated, categorical independent variable is 'sugar' whereas the dependent variable is our taste index.*

*19.3. **More information**: This is perhaps the most important and most complicated question within the preregistration. As with all of the other questions, the key is to provide a specific recipe for analyzing the collected data. Ask yourself: is enough detail provided to run the same analysis again with the information provided by the user? Be aware for instances where the statistical models appear specific, but actually leave openings for the precise test. See the following examples:*

19.3.1.1. If someone specifies a 2x3 ANOVA with both factors within subjects, there is still flexibility with the various types of ANOVAs that could be run. Either a repeated measures ANOVA (RMANOVA) or a multivariate ANOVA (MANOVA) could be used for that design, which are two different tests.

19.3.1.2. If you are going to perform a sequential analysis and check after 50, 100, and 150 samples, you must also specify the p-values you'll test against at those three points.

STATISTICAL MODELS:

We will run a 2 (level: category (no brand) vs. brand; between-subject factor) × 2 (product type: utilitarian vs. symbolic; within-subject factor) mixed ANOVA on the difference scores (averaged for each subject and each product type).

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20. Transformations

20.1. If you plan on transforming, centering, recoding the data, or will require a coding scheme for categorical variables, please describe that process.

*20.2. **Example**: The "Effect of sugar on brownie tastiness" does not require any additional transformations. However, if it were using a regression*

analysis and each level of sweet had been categorically described (e.g. not sweet, somewhat sweet, sweet, and very sweet), 'sweet' could be dummy coded with 'not sweet' as the reference category.

20.3. ***More information****: If any categorical predictors are included in a regression, indicate how those variables will be coded (e.g. dummy coding, summation coding, etc.) and what the reference category will be.*

TRANSFORMATIONS: Since the original study did not use any transformation and the main dependent variable is average score differences between two Likert scale items (benefit rating - symbolic rating; both are 7-point Likert type scale questions), we will not use any data transformation.

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21. Inference criteria

21.1. What criteria will you use to make inferences? Please describe the information youÍll use (e.g. p-values, bayes factors, specific model fit indices), as well as cut-off criterion, where appropriate. Will you be using one or two tailed tests for each of your analyses? If you are comparing multiple conditions or testing multiple hypotheses, will you account for this?

21.2. ***Example****: We will use the standard p<.05 criteria for determining if the ANOVA and the post hoc test suggest that the results are significantly different from those expected if the null hypothesis were correct. The post-hoc Tukey-Kramer test adjusts for multiple comparisons.*

21.3. ***More information:*** *P-values, confidence intervals, and effect sizes are standard means for making an inference, and any level is acceptable, though some criteria must be specified in this or previous fields. Bayesian analyses should specify a Bayes factor or a credible interval. If you are selecting models, then how will you determine the relative quality of each? In regards to multiple comparisons, this is a question with few "wrong" answers. In other words, transparency is more important than any specific method of controlling the false discovery rate or false error rate. One may state an intention to report all tests conducted or one may conduct a specific correction procedure; either strategy is acceptable.*

INFERENCE CRITERIA:

Criteria for a successful replication attempt for the SCORE project is a statistically significant effect (alpha = .05, two tailed) in the same pattern as the original study. For this replication attempt, this criterion is met by a statistically significant interaction of level (category (no brand) vs. brand) x product type (utilitarian vs. symbolic) in the mixed ANOVA.

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22. Data exclusion

22.1. How will you determine what data or samples, if any, to exclude from your analyses? How will outliers be handled? Will you use any awareness check?

22.2. ***Example****: No checks will be performed to determine eligibility for inclusion besides verification that each subject answered each of the three tastiness indices. Outliers will be included in the analysis.*

22.3. ***More information****: Any rule for excluding a particular set of data is acceptable. One may describe rules for excluding a participant or for identifying outlier data.*

DATA EXCLUSIONS: If a subject participates in the study multiple times, his or her first data will be used in the data analysis and his or her data collected in subsequent data collection will be excluded in the data analysis. It is possible that participants could be less concentrated on the task in online settings, two additional attention check questions will be added to measure their engagement: (1) a question that asks participants to select a designated response in the middle of the main task (a multiple choice question with a single correct answer) and (2) a question that asks whether they have taken the task seriously (yes vs. no) at the end of the study. Participants who failed to provide the correct answer for the first attention check question or did not take the experiment seriously will be excluded in the data analysis.

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23. Missing data

23.1. How will you deal with incomplete or missing data?

23.2. ***Example****: If a subject does not complete any of the three indices of tastiness, that subject will not be included in the analysis.*

23.3. ***More information****: Any relevant explanation is acceptable. As a final reminder, remember that the final analysis must follow the specified plan, and deviations must be either strongly justified or included as a separate, exploratory analysis.*

MISSING DATA: If a subject does not complete any of the two rating questions (benefits and symbolism), the response for this item will be excluded in the data analysis. Also, if a participant does not complete the questions for all the four utilitarian or symbolic items, that subject will be excluded in the data analysis.

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24. Exploratory analysis (optional)

24.1. If you plan to explore your data set to look for unexpected differences or relationships, you may describe those tests here. An exploratory test is any test where a prediction is not made up front, or there are multiple possible tests that you are going to use. A statistically significant finding in an exploratory test is a great way to form a new confirmatory hypothesis, which could be registered at a later time.

*24.2. **Example**: We expect that certain demographic traits may be related to taste preferences. Therefore, we will look for relationships between demographic variables (age, gender, income, and marital status) and the primary outcome measures of taste preferences.*

EXPLORATORY ANALYSIS:

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Other

25. Deviations from the original study (required)
    25.1. Please describe any known deviations from the original study. Include discussion of whether and how these deviations might impact the results of this replication/reproduction attempt and its comparison to the original study.
26. Other (optional)
    26.1. If there is any additional information that you feel needs to be included in your preregistration, please enter it here. Literature cited, disclosures of any related work such as replications or work that uses the same data, or other context that will be helpful for future readers would be appropriate here.

DEVIATIONS AND OTHER INFORMATION: There are three major known deviations from the original study:

1. **Change in the name of one of the items (UF shirt -> UD shirt)**. Since the study will be conducted in a different institute, the name of the college shirt has to be modified. This is not expected to affect the replication results.
2. **Experiment environment (laboratory vs. online)**. The original study was conducted in a laboratory, whereas the current study will be online. In online settings, participants could be distracted more, and this could result in a weaker effect than the original study.
3. **Task setting (single task vs. multiple tasks).** Whereas the original study was a part of a longer laboratory session with other unrelated tasks before and after, participants in the current study will complete only one task. Since those other tasks in

the original study were unrelated tasks, this is not expected to affect the replication results.