

**RUNNING HEAD: MEASURING SELF-DOUBT THROUGH ANSWER SELECTION
ANALYSIS**

Emotionally Caused Increases in Self-Doubt, as Measured
Through Self-Reported Self-Esteem & Intensity of Second Guessing

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Abstract

This study will look to see if one can increase the difference between a participant's initial answer to a question on an online survey, and the answer they choose to submit. This is important as it may lend insight to the honesty which participants are answering with, and the self-doubt which may be caused by the nature of emotionally charged questions. The study is to be conducted through Canadian University Undergraduate study programs, where universities reward in-class percentages for participation. This will be done through an online survey which tracks not only the final answers that the participant submits, but also how they changed those answers before submitting. The subject will be given a redacted//misleading brief, informing them that their information will be stored with their answers, and that they will be completing a survey to look at self-esteem levels in participants. The participant will then enter a 3-part loop for 5 cycles, where they are asked 15 general opinion-based questions, followed by a Rosenberg Self-Esteem Survey (RSES) (Rosenberg, 1965), and lastly complete an emotionally charged long-answer question. Emotionally charged questions are rated on a [-4, +4] scale, with -4 being very negative, and +4 being highly positive. The survey tracks the first choice and final choice for each question, measuring it as the Difference in Answer (DIA). Lastly, a debriefing is conducted, informing the participant that their information will not be stored with their answers, and that DIA was being tracked. It is anticipated that positively charged questions will reduce the DIA, and that the negatively charged questions will cause the user to doubt themselves more, and as such increase their DIA. This is important due to how common online research is during COVID, and if a correlation is found it would suggest that researchers may need to account for emotionally triggered self-doubt decreasing data accuracy. Appropriate statistical methods will be applied to the results as to highlight correlations between the charge of the question, and the resulted self-doubt & self-esteem levels. An additional study can be done looking at the submitted self-esteem answers, to connect the questions to significant changes in self-perception.

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The theory being tested is that users will adjust their answers to questions, in order to either reduce the judgment that they feel the researcher may apply to them, or as a sign of self-doubt. If one were to ask emotionally-charged questions intended to raise or lower self-esteem levels, they may be able to also increase the self-doubt experienced by the patient, and as such see an increase in the difference between their initial selection of answers, and the one they choose to submit.

Previous work in the field has dedicated time to determining the reliability of online surveys in undergraduate populations, having “found that approximately 10%–12% of undergraduates completing a lengthy survey for course credit were identified as careless responders” (Meade & Craig, 2012). As such, one knows that data reliability can be estimated by planting multiple known-answer questions randomly throughout the survey as is done in the Careless Response Measure (Meade & Craig, 2012). Prior studies have also indicated that participants tend to avoid changing their answers on multiple choice surveys of which they are being scored (Bauer, Kopp, & Fischer, 2007) (Kruger, Wirtz, & Miller, 2004). As such, the study is not to be written in a way which participants feel there is a right or wrong answer to their opinions, and with data-quality safeguard included.

Rich amounts of previous work which considers the effect on emotion on decision making is abundant, as is shown in the 2015 review by Lerner et al., where the major 8 themes of

emotional effects on decision making are explored. Researches such as Lerner (2000, 2010), Keltner (2000, 2010), Pham (2007), Yates (2007), write on the idea of incidental emotions, and more importantly how they “carry over” to following tasks which should be unrelated logically. Such studies examined decision making and critical thinking, however they did not examine how it effects selection making in surveys.

Studies related to survey collection sought to analyse the data in-post and determine whether or not the changing of answers during quantitative achievement-tests effects overall score (Mueller & Wasser, 1977); comparing first choice with final choice to measure changes in self-doubt as influenced by the implications of the questions during objective opinion surveys appears to have been thinly explored.

It is hypothesized that the participants Difference in Answers (DIA) will be affected by the emotional charge e (where $e \in [-4, 4]$), with a negatively charged question increasing the DIA, and positively charged question decreasing said DIA. This will be tested by measuring DIA as

$$\frac{\sum_{i=1}^n (|I(i) - F(i)|)}{n}$$

Where

n = # of total questions

$I(x)$ = Initial selection for question x where $I(x) \in [0, 10]$ & $0 < x \leq n$

$F(x)$ = Final selection for question x where $F(x) \in [0, 10]$ & $0 < x \leq n$

Method

Participants

This study will be conducted on young adults between the ages of 18 and 25 currently attending a major Canadian University. Gender and sex as well as sexuality have no effect on selection for being in the study.

The study will take a sample size of 500, divided amongst the 5 survey types, collected over a four-month period. This number allows for suitable confirmation of trends for each specific survey. It will recruit using the University of Ottawa research volunteer credit system, as well as equivalent systems at other universities, to recruit undergraduate and graduate students looking to gain marks in their courses. Participants will be randomly given one of five studies, and grouped according to which study they participated in. The studies will be structured the same, however the emotional tone of the questions will differ. For example, one survey may be all positive questions, one may be all negative, one may be neutral, etc. Participants will be rewarded with in class marks, as is common in courses taken within the faculty of social Sciences at the University of Ottawa.

Apparatus

Five versions of the same structured survey will be produced. The emotional context of the survey will differ between each. Participants will be randomly assigned one of these surveys upon entering the study.

The types of surveys are as follows...

- Survey 1: Positive-ranked long response questions ($e_1 \in \{-4, -3\}$)
- Survey 2: Negative-ranked long response questions ($e_2 \in \{3, 4\}$)
- Survey 3: Neutral long response questions ($e_3 \in \{-1, 0, 1\}$)
- Survey 4: Positive then negative-ranked long response questions ($e_4 \in \{4, -3\}$)
- Survey 5: Negative then positive-ranked long response questions ($e_5 \in \{-4, 3\}$)

Those taking the neutral study will not have an emotional influence applied to them, and therefore can work as a baseline for the average difference which users have between their first chosen answer and their submitted answer. Surveys one and two are the core emotional surveys, looking to see a strong common connection between intensities of second-guessing and the type of emotional charge. The combination surveys (4 &5) are intended to allow verification of the findings of surveys one and two.

These surveys will be taken online, and therefore do not have specifications for the conditions which they are taken in. The surveys must be conducted in a one sitting, as taking a break or gap between answering the emotionally charged questions and filling out the self-esteem questions will nullify the connection between the two, as they will then have time to neutralize how they feel.

There is a misleading element to this study, where participants are told (falsely) that their basic personal information will be stored with their answers for census reasons. The reason for

this is to remove the true anonymous nature, to reduce both low-quality surveying (Meade & Craig, 2012), and to cause the participant to believe that the answers they pick will be associated with them in real life. This looks to prevent the mentality of “it won’t come back to me, so the accurate answer doesn’t truly matter, even if I doubt what I’ve chosen”. Participants will also be told that the intent of the study is to measure self-esteem, as to avoid discouraging them from changing their answer selection.

The survey consists of 3 components, as structured below...

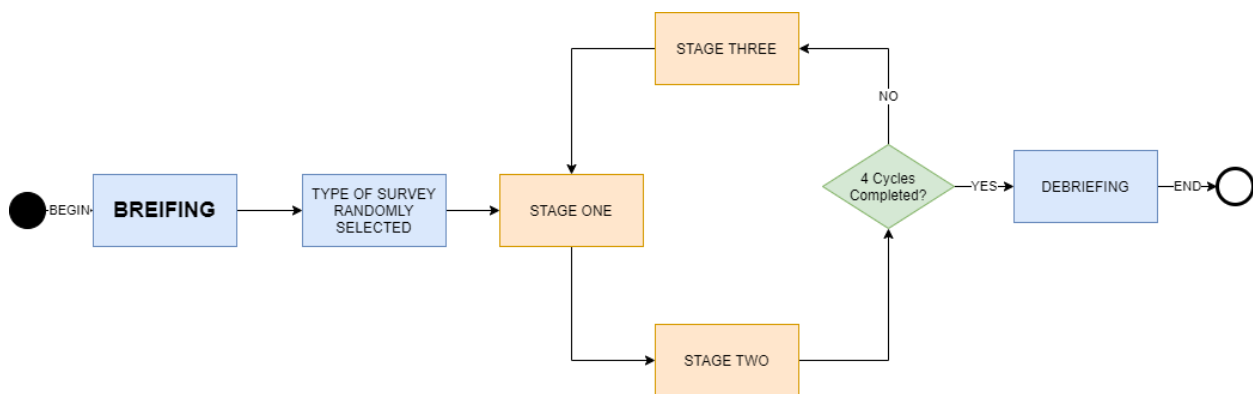


Figure 1 Overview of Survey Structure

Stage One | 15 general opinion questions are presented to the participant. There is no correct answer to these questions, but they do hold some personal weight to the participant such as to question their ability or stance on topics. Each question is ranked with an emotional range ranging from -4 to +4. More than 75% of questions will be between -1 and 1, as to not provoke additional or counteract previous emotional conditions. Questions are pulled from a pool of questions randomly. This is where the Difference in Answers is

calculated. Randomly placed throughout these questions are regulating questions to confirm the participant is reading each carefully (REFERENCE).

Stage Two | The participant conducts the Rosenberg Self-Esteem Survey (Rosenberg, 1965).

Stage Three | The participant is asked to fill out a long-answer question, which is ranked either -4, 0 or 4 depending on which type of survey they've been presented.

Procedure

This will be a descriptive research online survey, measuring how a participant rates their own self-esteem using the Rosenberg Self Esteem Survey (RSES) (Rosenberg, 1965), after answering both an emotionally scored long response question, as well as a randomly drawn set of multiple-choice opinion-based questions. The survey cross-compares the results of the RSESs for changes in score, as well as calculates the differences between the first selection and final selection of each general opinion question (DIA) for similar change.

The user will be presented with a survey and will not be told that the study is tracking their initial choice as well as what they submit. They are told their basic information will be connected to their answers to place more pressure on honest answers. The participants are also informed they will be asked to give both paragraph responses, as well as to answer multiple choice questions with a response range of 0-10. They are then given one of the five prior mentioned types of surveys, without being informed which version they have received, and are asked to complete it in one sitting.

At the end of the data collection the participant will be provided with the true nature of the study, and be given permission to withdraw their tenancy and their results without punishment, and will still be awarded the percentage for the course as guaranteed at the beginning.

Post data collection, researchers will be looking for correlations between the type of emotional stimuli, the order of the emotional stimuli, and the intensity of differences between initial answer selection and the submitted answers. The researcher is looking for a common and noticeable difference in this gap based on which type, and intensity, of emotionally charged questions they were given prior. These results are compared to the baseline test group of the neutrally charged survey, which contains all questions with charge (i.e. where $e \in \{-1, 0, 1\}$).

Participants will be given a blind study key, and no information on the participants will be stored during the collection of data, to assure privacy of participants.

Anticipated Results

It is expected that the negatively charged questions will cause the user to doubt themselves more, and therefore a larger gap between their initial choice and what they choose to submit to researchers will appear.

The correct statistical methods will be applied to the DIA, to find correlations between the ranked charge of prior questions, and the intensity of the DIA. As well, statistical cross-examination will be applied to each submission of the Rosenberg Self Esteem Survey (RSES)

(Rosenberg, 1965), to explore a correlation between the question's charges and changes in Self-reported Self-esteem.

If there is no correlation between the charges of the prior questions, and the changing of one's answers, one would be incorrect and therefore more likely to not see a steady shift in any of the above-mentioned factors. The data will be non-correlated and scattered when examined, indicating no connection between the different components.

Discussion

If the hypothesis is determined to be true, it would indicate that researchers need to carefully plan their surveys to avoid including emotionally weighted questions before multiple choice, as the answers given may be far more moderated than if they follow a neutral setting. This hypothesis would not contradict the findings of previous studies, as the previous studies examined whether a subject changed their choice, and not the intensity of said choice. It may additionally work as a confirmation of the crossover effect of incidental emotions (Lerner et al, 2015) as it effects opinion-based decision making.

As the survey will only be using undergraduate and graduate students, it will not be pulling an accurate sample size or sample distribution of the population of Canada. Additionally, young people tend to be more self-conscious and non-confident in their answers due to their inexperienced nature, and their DIA may not be representative of the general population. The survey will run the risk of inaccurate or low-quality data due to the pool which it is being pulled from.

Perhaps the largest potential flaw of the survey is the potential overlap between confident subjects and the least reliable. Both may choose their answer, and not change it thereafter. Their ratings on the RSES may both remain steady, and the DIA would be 0. Differentiating between these users would be very difficult.

A far larger scale survey would combat issues relating to the sample size discrepancies, as well as both the under confidence of the sample population and the low-level data. Human intervention may work to differentiate between low-quality and confident subjects, through analysis of their long answer questions. Low-quality subjects may answer with much less informative and accurate answers to these questions, and as such could be removed as potentially bad surveyors.

Ethical concerns may arise from the nature of the questions, as it may cause some users to become distressed or self deprecating and may leave them in a negative mood for some period. As with any deceit-based research, finding out that there was a second motive of the survey may leave the subject feeling negative or deceived.

In the future, repeating prior studies both with the removal of emotionally charged questions and the original, and tracking the DIA for both, to see if the found hypothesis holds up even after participant's emotions remain neutral.

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Figure Captions

Figure 1. This figure shows the Overview of the Survey Structure. The survey begins with a briefing & random survey assignment, immediately followed by entering into a 3-stage loop, consisting of a) 15 general opinion questions |b) Rosenberg Self Esteem Survey |c) Emotional paragraph response question, with a conditional breaking point between b & c of 4 cycles. Participants are then debriefed.

Figure 1

