Assessing Self-Selection Bias as a Function of Experiment Title and Description: The Effect of Emotion and Personality

Tina M. Sutton and John E. Edlund
Rochester Institute of Technology

Research has indicated that self-selection bias serves as a threat to external validity when the title of an experiment directly influences the dependent variables being measured. The goal of the current study was to investigate mood and personality differences between groups of individuals who signed up for a study that varied on the type of emotion focused on as part of the study description (Experiment 1 conducted in person), or if the study examined personality (Experiment 2 conducted online). The results of Experiment 1 indicated that participants who completed the negative version of the study reported higher levels of negative affect on the Positive and Negative Affect Schedule (PANAS) and displayed mood-congruent judgment in a word fragment completion task, completing more negative words than individuals in the positive version of the study. The title of the study did not influence results in Experiment 2. This research suggests that self-selection bias may be a bigger concern for in-person studies than online studies.

Keywords: selection bias; emotion; personality; mood-congruency

Recently, Demir, Haynes, Orthel-Clark, and Özen (2017) argued that volunteer bias is a concerning potential confound in experimental research that has been largely ignored in the literature since the 1990s. Research examining the influence of participant-pool recruitment procedures has indicated that there may be a need to carefully consider selection bias if the topic or title of the experiment provided could influence the dependent variable(s) being measured (e.g., Jackson, Procidano, & Cohen, 1989; Saunders, Fisher, Hewitt, & Calyton, 1985; Silverman & Margulis, 1973; Slonim, Wang, Garbarino, & Merrett, 2013).

Self-Selection Bias

Jackson et al. (1989; Experiment 2) varied the information available to participants at the time they signed up for a research study. Participants could sign-up for a study entitled "Personality Feedback" in

Author info: Correspondence should be sent to: Dr. Tina M. Sutton, Department of Psychology, George Eastman Hall, Rochester Institute of Technology, 18 Lomb Memorial Drive, Rochester, NY 14623. E-mail: tmsgsh@rit.edu
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which they would be asked to give a short speech to a group of experts who would provide them with feedback about their personality based on the speech. In a second study entitled "Proofreading," participants were told that they would proofread short articles and provide feedback regarding clarity, grammar, and punctuation (Jackson et al., 1989). Participants could sign up for individual time slots or group time slots for either study. All participants completed a demographic questionnaire and a personality inventory. The results revealed a clear self-selection bias. Participants selected the experiment that more closely matched their personality. Specifically, participants who were more extraverted, broad-minded, receptive, and self-assured were more likely to sign up for the "Personality Feedback" study. In addition, anxiety was related to selection of individual time slots or group time slots, with more anxious participants selecting group time slots.

Similarly, Silverman and Margulis (1973) advertised two studies to introductory students entitled "Personality Assessment" or "Color Preferences." After arriving at the lab, participants in the "Color Preferences" study were told that the materials for their study were being revised, but they could stay for a study examining personality if they wished. All participants completed a personality inventory. The results revealed that simply altering the title of the experiment resulted in different types of participants signing up for each study. The participants who signed up for the "Personality Assessment" study rated themselves as more extraverted, autonomous, more likely to engage in learning and other diverse experiences, less practical, and more skeptical of religious conventions. Both Jackson et al. (1989) and Silverman and Margulis (1973) found that indicating that a study would examine personality resulted in a sample with different personality characteristics than studies that did not include the word personality in the title.

Saunders et al. (1985) reported differences in both sexual attitudes and sexual experiences between participants who volunteered to complete a study focusing on erotica compared to those who volunteered to complete a nonsexual experiment. Once again, the title of the experiment created a self-selection bias such that the volunteers for the erotica study reported more sexual experience, and females in the erotica study were less erotophobic than the female volunteers in the nonsexual experiment. Volunteer bias has also been examined in friendship research. In a series of studies, Demir et al. (2017) reported that women were more willing than men to volunteer for a research study focusing on same-sex best friendship (Experiment 1), and that individuals with more positive friendship experiences were also more likely to volunteer for the study (Experiment 3).

Self-selection bias is particularly concerning when the selection effect influences the responses collected; thereby reducing the generalizability of the results of the study (relatedly see Chandler, Paolacci, Peer, Mueller, & Ratliff, 2015). Slonim et al. (2013) examined multiple factors that may influence a participant's willingness to sign up for an economics experiment (i.e., wealth, time, intellectual curiosity, pro-social preferences, risk attitudes and recruitment conditions). Most relevant to the current study was the factor of intellectual curiosity. Slonim et al. found that their study entitled "Economics Decision-Making" attracted more economics and business majors than any other major. Similarly, the goal of the current work was to examine self-selection bias based on the title of an experiment, but focusing on affect and personality traits.

Mood Congruency

Although researchers often take care in controlling, measuring, and/or reporting participant variables such as age, gender, ethnicity, native language, etc., fewer researchers measure the mood state or personality characteristics of their sample. It is known that both mood state and personality traits can influence cognitive processes, such as memory and judgment. Mood congruent memory effects have been reported for a number of tasks, including recall, recognition, emotional Stroop and emotional go/no-go tasks (Elliot, Rubunsztein, Sahakian, & Dolan, 2002; for a review see Forgas, 1994). Emotional stimuli are preferentially processed, learned, and remembered when one's mood state matches the affective valence of the stimulus. According to the network theory of affect, when an emotion node (e.g., sadness) is activated within the memory network, similarly valenced information/memories are also activated (Bower, 1981). When these mood-congruent thoughts are used to judge the likelihood of different events or outcomes, researchers often refer to this as the mood-congruent judgment effect. Mayer, Gaschke, Braverman, and Evans (1992) suggested that mood-congruent judgment is a general effect that automatically occurs when responses can be "distinguished according to their mood congruence" (Mayer et al., 1992, pp. 119).

Research has also indicated that emotion-congruency effects in memory and judgment are influenced by personality (MacLeod, Andersen, & Davies, 1994; Rusting, 1998, 1999). Neuroticism, or emotional instability, correlates with negative affect, whereas extraversion, or seeking gratification from external sources, correlates with positive affect (Rusting & Larsen, 1997). Participants higher in positive affect (as measured by the *Positive and Negative Affect Schedule*; PANAS; Watson, Clark, & Tellegan, 1988) are more likely to recall positive memories, while participants who score higher in negative

affect are more likely to recall negative memories (MacLeod et al., 1994). In addition, participants who score high on extraversion are more likely to make positive judgments (e.g., report that they are more likely to find "true love" or become very wealthy), while participants who score high on neuroticism are more likely to make negative judgments (e.g., more likely to fail a course or lose someone they love) (e.g., Zelenski & Larsen, 2002).

Rusting (1999) asked participants to complete three tasks: (1) a spelling task, (2) a story-completion task, and (3) a free recall task. In the spelling task participants listened to a series of words and spelled each word as they heard it. Sixteen of these words were homophones that had an emotional connotation or a neutral meaning (e.g., peace-piece, die-dye). In the story-completion task participants were provided with an emotionally ambiguous sentence and asked to complete a story describing the thoughts and feelings of the characters. In the recall task, participants were asked to rate the "pleasantness" of 36 words, and then were given a surprise recall test for the items. Participants also completed two personality measures, the PANAS and the *Eysenck Personality Questionnaire* (Eysenck & Eysenck, 1972). In Experiment 1, natural mood was measured at the beginning of the study. In Experiment 2, a positive or negative mood was induced. The results of both experiments revealed that personality and mood contributed to mood congruency effects, such that positive mood, positive affect, and extraversion produced greater recall of positive words, a greater likelihood of providing the positive homophone in the spelling task, and a more positive story. Negative mood, negative affect, and neuroticism were all related to negative congruent memory and judgment for the three tasks. The effects of mood were larger in Experiment 2, when mood was induced, than in Experiment 1. Rusting concluded that mood state and personality traits interact to produce mood congruency effects.

Although selection bias has been identified as problematic for generalizability in research studies (e.g., Demir et al., 2017; Slonim et al., 2013), the literature is sparse. The current work will examine the extent to which self-selection bias is present when the title of an experiment is manipulated to highlight relevant variables of interest, such as emotion (Experiment 1) and personality (Experiment 2).

EXPERIMENT 1

The current study aimed to investigate the possible existence of a self-selection bias in an experiment examining emotion and decision-making. Specifically, we tested whether or not manipulating the title of the experiment would attract samples of participants who displayed differential moods and personality characteristics. Participants had the

opportunity to sign up for a study that examined the effect of positive or negative emotions on decision-making. Consistent with mood congruency theory, we hypothesized that individuals who signed up for the negative mood condition would produce more negative words in a word-stem completion task, while those who selected the positive mood condition would produce more positive words in the task. In addition, the description of the study indicated whether one would complete the experiment individually, or in a group setting.

Method

Participants Two hundred and fifty participants from Rochester Institute of Technology (RIT) completed the current study. Fifty-one percent of the participants were male and 49% were female. The average age of the participants was 19.57 years (*SD* = 2.60). Sixty-nine percent of the sample was Caucasian, 15% was Asian, 7% was African American, 4% was Hispanic, and the remaining 5% self-identified as "other." Seventy-six of the participants completed the Positive/Individual condition, 59 completed the Positive/Group Condition, 62 completed the Negative/Individual condition, and 53 completed the Negative/Group Condition.

Materials Participants completed a word fragment completion task (see Appendix), and four questionnaires: (1) a demographics questionnaire, (2) The *Beck Depression Inventory-II* (BDI-II; Beck, Steer, & Brown, 1996), (3) The *Positive and Negative Affect Schedule* (PANAS; Watson et al., 1988), and (4) the *Big Five Inventory* (BFI; John & Srivastava, 1999).

Word Fragment Completion. The word fragment completion task consists of 18 items, five positive words (e.g., achievement) five negative words (e.g., anxious), and eight neutral words (e.g., boulevard). Most of the stems could only be completed with one possible word; however, a few had more than one possible response that was similarly valenced (see Appendix). A separate score was calculated for each word type. Participants received a score between 0 and 5 for both the positive words and the negative words (1 for each stem correctly solved) and a score between 0 and 8 for the neutral words.

Beck Depression Inventory—II (BDI-II). The BDI-II is a 21-item self-report measurement with a scale value of 0 (no symptom) to 3 (high symptom) intended to assess the existence of symptoms of depression. A total score of 0-13 is considered minimal range, 14-19 indicates mild depression, 20-28 is moderate depression, and 29-63 is severe depression. The reliability of the BDI-II with college samples is high with a coefficient alpha of .93 (Beck et al., 1996).

*Positive and Negative Affect Schedule (PANAS)***.** The PANAS measures positive affect and negative affect by asking participants to respond to 20 items, using a 5-point scale ranging from very slightly or not at all (1) to extremely (5). Ten of the items measure positive affect (e.g., proud) and 10 of the items measure negative affect (e.g., afraid). Scores for positive and negative affect range from 10-50, with higher scores representing higher levels of positive and negative affect. In this study, we used the dispositional phrasing of the PANAS. The internal consistency for the positive affect score and negative affect score of the PANAS are high, 0.86-0.90 and 0.84-0.87, respectively (Watson et al., 1998). In the current study, Cronbach's alpha for the positive affect score was 0.87 and 0.82 for the negative affect score.

Big Five Inventory (BFI). The BFI is a 44-item inventory that measures the Big Five Factors of personality: (1) extraversion, (2) agreeableness, (3) conscientiousness, (4) neuroticism, and (5) openness. Participants are asked to select a value from disagree strongly (1) to agree strongly (5) for a number of characteristics that may or may not apply to them (e.g., I see myself as someone who is talkative). According to John, Naumann, and Soto (2008), in samples from the United States, the alpha reliabilities for the five subscales average above 0.80 and range from 0.75-0.90. The alpha reliabilities for each of the subscales in the current study were .79 for Agreeableness, .76 for Conscientiousness, .85 for Extraversion, .85 for Neuroticism, and .76 for Openness.

Procedure Students enrolled in Introduction to Psychology and other Psychology courses that offered extra credit completed the current study. Participants' select which experiments they wish to complete from a variety of experiments posted on SONA-Systems participant management software. Introduction to Psychology students must complete two hours of research participation or an equivalent amount of research reports (two reports). In any given semester at RIT, a minimum of 20 studies are posted, worth an average of 1/2 hour of research credit (each). Students are able to view the titles and a short description of each study posted. The name of the current study was manipulated to include either the word "positive" or "negative" in the title. The title of the experiment was *The Effect of Positive/Negative Emotions on Decisions*. In addition, the description of the experiment was manipulated to indicate that participants would complete the experiment individually, or in a group. All participants completed the experiment individually, regardless of the description provided on SONA. Participants could only view one version of the study because only one of the four versions was available on SONA each semester. In addition, each version of the study had a system enforced exclusion criterion (where the SONA system would

prevent the participant from even knowing another version of the study existed if they had participated in one of the versions). For example, if a participant completed the Negative/Individual condition, the other versions of the study would not be available to them on the SONA website. In other words, they would not know that any other version existed. The description of the study was as follows: *The purpose of this study is to investigate the impact of positive/negative emotions on the decision-making process. In this study, you will be asked to complete a number of questionnaires related to your personality and decision-making. This study will be conducted individually/in a group setting.* This manipulation resulted in a 2 (positive or negative) x 2 (group or individual) design.

After arriving at the laboratory, participants were greeted by the experimenter and asked to read, sign, and date the informed consent form (all sessions were run individually, regardless of the advertised information). After completing the consent form, participants were given a packet with the questionnaires and word fragment completion task. All participants completed the demographics questionnaire first, followed by the word fragment completion task, BDI-II, PANAS, and BFI. The participants were given up to 10 minutes to complete the word fragment completion task. They were instructed to take as long as they needed for the remaining questionnaires. The experiment lasted approximately 25 minutes.

Results

Our first analysis was an investigation into whether the kind of words generated by participants was impacted by the study design. All analyses were subject to a 2 (emotion featured in study advertisement: positive/negative) x 2 (advertised type of the study: individual/group) ANOVA. All assumptions of ANOVA were met (normality of data). The number of positive words generated was impacted by the type of study, such that more positive words were generated in the group advertisement (M = 2.60, SD = 1.22) than in the individual advertisement (M = 2.28, SD = 1.22), $F(1, 246)=5.17$, $p=.024$, $\eta_p^2 = 0.021$. The number of negative words generated was impacted by the advertised emotion of the study, such that more negative words were generated in the negative advertisement (M = 1.42, SD = 1.10) than in the positive advertisement (M = 1.11, SD = 1.03), $F(1, 246)=4.50$, $p=.035$, $\eta_p^2 = 0.018$. All other non-reported effects were non-significant (p's>.10).

Next, we evaluated the impact of the study design on affect using the same 2 x 2 ANOVA. Negative affect was impacted by the advertised nature of the study, such that participants responding to the negative advertisement reported higher levels of negative affect (M = 16.56, SD =

6.03) than in the positive advertisement (M = 14.96, SD = 5.18), $F(1, 246)=4.82$, p=.029, $\eta_p^2 = 0.019$. All other non-reported effects were non-significant (p's>.10).

Discussion: Experiment 1

As expected, the manner in which the current experiment was advertised resulted in different samples of individuals signing up for the study. When the study was advertised as focusing on negative emotions, participants reported higher levels of negative affect, as measured by the PANAS. Perhaps higher levels of negative affect result in the selection of studies that are consistent with one's current mood state. Consistent with mood-congruent processing, negative mood facilitates the processing of negative information. Participants in the negative condition were more likely to generate negative words in the fragment completion task than participants who signed up for the exact same study that was advertised as examining positive emotions. These results are consistent with the mood-congruent judgment effect. Likely, participants were more likely to generate the negative word because it was consistent with their negative mood.

When the study was advertised as occurring in a group setting, more positive words were generated. We believe that this occurred due to the nature of the individuals recruited. Similar to the research of Jackson et al (1989), the purported group setting may have resulted in recruitment of more dispositionally positive individuals. Another possibility exists that the group setting resulted in the recruitment of participants who were lower in anxiety (and hence, more likely to generate positive words).

EXPERIMENT 2

In Experiment 1, the title of the study focused on emotion and decision-making. As a result, differences were obtained on the mood measure, and mood-congruent effects were obtained in the negative condition; however, the groups did not differ on the personality measure. The goal of Experiment 2 was to examine if differences could be obtained on the BFI if the title of the experiment focused on Personality as a component of the study. Previous research has indicated that studies advertised as "Personality Feedback" (i.e., Jackson et al., 1989; Experiment 2) or "Personality Assessment" (i.e., Silverman & Margulis, 1973) have attracted participants who are more extraverted, self-assured, and autonomous; therefore, we hypothesized that participants who signed up for the Personality version of the study would be more extraverted and open-minded than those who signed up for the Proof Reading version of the study.

Method

Participants One hundred and sixty five participants from RIT completed the current study. Fifty-seven percent of the participants were male and 43% were female. The average age of the participants was 19.90 years (*SD* = 2.41). Sixty-seven percent of the sample was Caucasian, 13% was Asian, 8% was African American, 6% was Hispanic, and the remaining 6% self-identified as "other." Seventy-nine participants completed the Personality condition and 86 participants completed the Proof Reading condition.

Materials The same word fragment completion task (see Appendix), and four questionnaires used in the first experiment were also used in the second experiment. The questionnaires included: (1) a demographics questionnaire, (2) The *Beck Depression Inventory*-II (BDI-II; Beck et al., 1996), (3) The *Positive and Negative Affect Schedule* (PANAS; Watson et al., 1988), and (4) the *Big Five Inventory* (BFI; John & Srivastava, 1999).

Procedure The name of the current study was manipulated to include either the word "personality" or "proof reading" in the title. The title of the experiment was *The Effect of Personality/Proof Reading on Decisions*. The data for the experiment were collected online, instead of in person. The title of the experiment was changed weekly on the SONA system, and participants could only sign up for one version of the study. For example, if a participant signed up for the Personality condition, they would not be able to view the Proof Reading condition. Sessions were 10 participants each (although participants could not see the number of timeslots, they could only see whether a timeslot was available). The questionnaires were presented in the exact same order as in Experiment 1. After completing the consent form, participants completed the demographics questionnaire first, followed by the word fragment completion task, BDI-II, PANAS, and BFI. The participants were given up to 10 minutes to complete the word fragment completion task. They were instructed to take as long as they needed for the remaining questionnaires. The experiment lasted approximately 25 minutes.

Results

Our first analysis was an investigation into whether the kinds of words generated by participants was impacted by the study design. All analyses were subject to a 2 level (title of study: effects of personality or proofreading) ANOVA. The advertising of the study did not impact the number of words generated $F(1, 163)=2.13$, $p = 0.146$, $\eta_p^2 = 0.013$. Regardless of condition, the number of positive words ($M = 2.39$, $SD = 1.29$) generated was higher than the number of negative words generated

(M = 1.15, SD = 1.29), and neutral words (M = 2.06, SD = 1.69) fell in-between the number of positive and negative words $F(2, 162)=74.08$, $p <.001$, $\eta_p^2 = 0.478$.

Next, we evaluated the impact of the study design on affect and personality using the same design. Conscientiousness was marginally impacted by advertising, such that participants in the personality condition had higher levels of conscientiousness (M = 52.76, SD = 9.79) than did participants in the proof-reading condition (M= 49.22, SD = 11.57), $F(1, 141)=3.85$, p =0.052, η_p^2 = 0.027. All other non-reported effects were non-significant (p's>.10).

We examined mood state using the PANAS. Overall, participants reported greater positive affect (M = 28.15, SD = 7.75) than negative affect (M = 15.69, SD = 5.56), $F(1, 249) = 388.38$, $p < .01$, $\eta_p^2 = 0.609$. Finally, we explored whether the study title influenced the quickness of the study signups. Participants signed up significantly faster for the study when it was advertised as personality (M_{days} = .97, SD_{days} = .87) than when it was advertised as proof-reading (M_{days} = 1.28, SD_{days} = 1.02), $F(1, 163) =4.17$, p=0.043, $\eta_p^2 = 0.025$.

Discussion: Experiment 2

The main goal of Experiment 2 was to manipulate the title to include the word "personality" or "proofreading" to determine if different samples of participants would select one version of the study over the other. We measured the Big Five Factors of personality (i.e., extraversion, agreeableness, conscientiousness, neuroticism, and openness) using the BFI. Individuals higher in conscientiousness signed up for the personality version of the study. Although we know that conscientiousness level assessed in studies varies across the semester (e.g., Ebersole et al., 2016), we cannot definitively say why this effect emerged in this study as the version of the study was counterbalanced across weeks (negating the possibility that time of semester impacted the results). Perhaps the most likely explanation is that the participants who were higher in conscientiousness would be the most motivated to learn about all aspects of their personality. Further research will be needed to definitively explain this finding. Participants in the current study signed up for the personality version of the study faster than the proofreading version of the study. Consistent with Slonim et al. (2013), this may reflect their greater interest in subject-matter more closely associated with their major (Psychology). The students completing SONA studies are enrolled in Introduction to Psychology or other Psychology courses.

Previous studies have indicated that participants often select studies that closely match their personality. Jackson et al. (1989) found that participants signing up for a "Personality Feedback" study were more

extraverted and open than those who signed up for a "Proofreading" study. Unexpectedly, we did not replicate this finding. It is important to keep in mind that the data for the current study were collected via an online survey. The majority of online studies, including the current study, take a translational approach; that is, adapting the methodology and materials of in-person studies to use online (Skitka & Sargis, 2006). The design of the current study was quite similar to that of Jackson et al. (1989); however, the results were different. It is possible that self-selection bias is less problematic for online studies advertised to college students completing the experiments for course credit compared to in-person studies.

Upon examining the data available from SONA at RIT, we found that on average, there are roughly the same number of in-person and online studies available to students who complete the Introduction to Psychology requirement and/or participants in studies for extra credit in their classes. For example, in the Fall 2016 semester, a total of 24 research studies were posted on SONA. Thirteen were offered as online studies and 11 were in-person studies. The number of credits that were granted for the two types of studies (online and in-person) were starkly different. A total of 5,421 credits were granted through the online studies and only 768 credits were granted through the in-person studies. At our institution, one credit is equivalent to 15 minutes of the participant's time. For the given set of 24 research studies, students gravitated toward online experiments. In fact, this was one motivating factor in offering Experiment 2 as an online study. Students may prefer online studies because they can complete the study at a time that is convenient for them and they do not have to leave the comfort of their dorm/apartment to receive research credit.

The title of the study did not influence the number of words generated in the word fragment completion task. Both groups of participants completed more positive words than negative or neutral words. In addition, the title of the experiment did not affect scores on the PANAS. Participants in the personality condition and participants in the proof reading condition reported similar levels of positive and negative affect. It is possible that the participants in both groups completed more positive words than negative words because they reported higher positive affect than negative affect—consistent with mood congruent judgment.

GENERAL DISCUSSION

The current work provides converging evidence that for in-person studies self-selection bias is problematic when it directly impacts the dependent variables being measured. Simply changing one word in the title of the experiment resulted in different types of individuals

volunteering to complete the study in Experiment 1. When the study was advertised as assessing *negative emotion*, individuals with higher levels of negative affect signed-up for the study, resulting in mood congruency effects for the word fragment completion task.

The activation of negative emotion may have increased the availability/accessibility of mood-congruent information, consistent with Bower's (1981) associative network theory of affect. These results suggest that providing detailed information in the title of the experiment regarding the valence of the emotion being studied can influence the dependent variables being measured. Mood-congruency effects are more likely to be obtained if the study is advertised as assessing negative emotion than positive emotion. Individuals who report higher negative affect, are more likely to participate in the study, and this negative mood state produces a mood-congruent judgment effect. It is important to keep in mind that the current study examined natural mood states. The majority of the studies focusing on mood-congruent effects include a mood-induction procedure prior to the experimental tasks. In such studies, mood-congruency effects are found with both negative moods and positive moods (e.g., Becker & Leinenger, 2011; for a review see Forgas, 1994). The data examining mood-congruency in natural mood states is mixed (e.g., Bargh & Tota, 1988; Mayer et al., 1992).

We believe that Experiment 1 further demonstrates that it may be best to limit the description regarding the purpose of an experiment when posting the study on data collection sites, such as SONA (Nichols & Edlund, 2015). Eliminating the type of emotion from the title may help to reduce or eliminate a self-selection bias. Minimizing the self-selection bias may then result in a truer evaluation of the effect under evaluation (Chandler et al., 2015).

In the past 10 years, more researchers have started collecting data online (Skitka & Sargis, 2006). There are a number of benefits associated with online data collection, such as: (1) making the research process more efficient (Skitka & Sargis, 2005), (2) greater anonymity (Joinson, 1999), (3) access to diverse and underrepresented samples of participants (e.g., Birnbaum, 2004), and (4) lower scores on measures of social desirability and anxiety (Joinson, 1999). The results of Experiment 2 suggest another potential benefit of online data collection—reduced self-selection bias. Students may prefer online studies to in-person studies, and the title of an online study may not influence whether or not a participant self-selects based on the nature of the study. On the other hand, if a student decides to complete an in-person study, the title of the study and the description may be more relevant, or important, and participants will select a study more consistent with their current mood state (as demonstrated in Experiment 1), personality (e.g., Jackson et al.,

1989; Silverman & Margulis, 1973), or sexual attitude and experience (e.g., Saunders et al., 1985). It is also worth noting that these research conclusions likely apply to any studies using an online subject pool (such as mTurk: www.mturk.com). For instance, Peer, Vosgerau, and Acquisti (2015) have noted that motivation level and the quality of the participants in mTurk impact the quality of the data collected.

Although we included a measure of depression in the current study, in the future it would be useful to also include a measure of anxiety, such as the *State-Trait Anxiety Inventory* (STAI, Spielberger, Gorsuch, Lushene, Vagg, & Jacobs, 1983) to assess how anxiety may have played a role in self-selection of the individual vs. group time slots in Experiment 1. Furthermore, in Experiment 2, we were unable to replicate previous research indicating that personality influences self-selection (e.g., Jackson et al., 1989). It is possible that the effects of emotion are stronger on self-selection than the effects of personality, or that self-selection is less problematic in online studies than in-person studies. We cannot distinguish between these two possibilities because the focus of the two studies in the current work was different. In Experiment 1 we manipulated the title to examine the effect of emotion on decision-making and in Experiment 2 the title focused on personality and decision-making. In the future, it would be beneficial to use the same experiment title and description in an in-person study and online study to distinguish between these two potential interpretations. Future research should present the various measures in several different orders to minimize the likelihood of a systematic order effect.

Greiner (2015) pointed out several potential concerns regarding participant recruitment, including minimizing self-selection effects. The current work suggests that researchers should pay attention to how they advertise their studies to help reduce such unwanted selection bias. We recommend that researchers include relevant information that a participant needs to be informed about the study when deciding to participate; however, we believe the researchers should keep this information from being affectively loaded along with not including any extraneous information (such as whether sessions are conducted in a group or individual setting). Our research suggests that these concerns may be somewhat attenuated in an online environment; however, we still believe these considerations are worthy of attention by researchers.

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APPENDIX

Word Fragment Task: This will be measuring a cognitive skill called inferential agility (the ability to complete missing letters in a word). Please complete as many of these words as you possibly can. Once you have finished (either if you have completed all of the items, or you know you cannot solve any more), please return this sheet to the experimenter for the next portion of the study. You will have 10 minutes on this task. Example: R _ P T _ _, would be completed as RAPTOR

P _ _ N _ I _ G	A _ X _ _ U _
A C _ I _ V E _ _ N T	_ U R _ _ N E D
_ E H _ V _ _ R A L	_ X C _ _ E M E _ _
F _ _ N D _ T _ _ _	D _ _ C O _ R _ _ E D
H U _ _ L I _ _ E D	O _ _ I M _ _ T I _
_ O U _ _ E _ A R D	_ N I _ _ R _ E
_ A T _ S F _ E _	S _ _ A _ B _ R _ _
T R _ _ M P _ _ N _	_ R U _ _ R _ T _ D
_ R _ S _ D E _ _	P _ _ T _ G _ _ P _

Neutral Words

Planting or Pointing
Behavioral
President or crusaders
Universe
Strawberry
Foundation
Photograph
Boulevard

Positive Words

Achievement
Triumphant
Excitement
Satisfied
Optimistic

Negative Words

Anxious
Frustrated
Humiliated
Discouraged
Burdened

Note: The current research was presented at the 57th Annual Meeting of the Psychonomic Society in Boston, Massachusetts in November 2016.