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### Title

Are Happy People Better Forecasters? Subjective Happiness and the Impact Bias

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ARE HAPPY PEOPLE BETTER FORECASTERS?  
SUBJECTIVE HAPPINESS AND THE IMPACT BIAS

By

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A capstone project submitted for  
Graduation with University Honors

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University Honors  
University of California, Riverside

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## Abstract

People often fall victim to a judgment error called the impact bias: the tendency to inaccurately forecast their emotions to future events, exaggerating the impact in terms of both the duration and intensity of their likely emotional response. *Study 1* aims to identify whether happier people are more accurate in terms of forecasting emotional responses when entering a relationship or when experiencing a breakup. Participants from mTurk ( $N = 500$ , age range 18-72) completed baseline well-being measures (e.g., happiness and life satisfaction) and predicted how happy they would be after entering a romantic relationship and following a breakup. Results showed an impact bias for breakups but not for entering relationships. Furthermore, happier people were more accurate when predicting emotional responses following a breakup. Our results suggest that happiness-boosting activities may also be effective at improving people's accuracy in emotional forecasts. Therefore, *Study 2* aims to identify whether happiness interventions (e.g., Counting Blessings and Savoring the Present Moment) can increase forecasting accuracy. Undergraduate students ( $N = 141$ , age range 18 – 36) were randomly assigned to either happiness intervention groups or a control group. They were then asked to forecast their happiness level if they received a good or bad grade before their midterm exam. They were then assessed their actual happiness level after the exam. Results indicate that happiness interventions further exaggerated happiness forecasting for the students forecasting their happiness level after a good grade. These results underscore the complexity and intricacy of the Impact Bias and its predictors. Clearly, more research is needed to assess the Impact Bias and its relationship with well-being constructs.

*Keywords: impact bias, affective forecasting, happiness, interventions*

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## Introduction

*One cannot divine nor forecast the conditions that will make happiness; one only stumbles upon them by chance, in a lucky hour, at the world's end somewhere, and holds fast to the days, as to fortune or fame.*

-Willa Cather, "Le Lavandou," 1902

In February 2017, a senior undergraduate at the University of California, Riverside received a denial letter from a top-ranked medical school. Upon learning the news, the student predicted that sadness will follow for years to come because of the rejection. After a month, however, the student stated rather than being sad about the previous rejection, he reported being quite happy due to other medical school acceptances and additional opportunities that presented themselves. Although the student predicted that he would experience high levels of negative emotion for years to come, the reality revealed that the student was only sad for little less than a month. The scenario is a fitting example of a judgment error called the *impact bias*: people's tendency to inaccurately forecast their emotions to future events, exaggerating the impact in terms of both the duration and intensity of their likely emotional response (Wilson, Meyers & Gilbert, 2003). In this paper, we present two studies that examine the impact bias. Specifically, we examined whether people who are happier by nature are less likely to fall victim to this bias.

### **The Impact Bias**

People often make surprising decisions. Patients sometimes refuse potentially life-saving medical procedures (Jodi & Arnold, 2008), jurors recommend death sentences in response to seemingly irrelevant information (Blumenthal, 2009), and victims of sexual

harassment fail to immediately report the crime to authorities (Woodzicka & LaFrance, 2002). These seemingly irrational decisions arise in part due to the impact bias. The impact bias has several sources: (1) *focalism*, the tendency to put too much weight on the focal event in predicting future emotional states (Wilson & Gilbert, 2003); (2) *projection bias*, the tendency to contaminate affective forecasts with current emotional states (Wilson & Gilbert, 2003); and (3) *immune neglect*, or the tendency to underestimate one's ability to cope with negative outcomes (Wilson, Meyers & Gilbert, 2003).

Considerable evidence supports the pervasiveness of the impact bias. However, far less is known about the predictors of forecasting accuracy or how to improve accuracy to prevent errors in law, medicine, and everyday decision making. Gilbert (2007) suggests one potential solution: an ideal way to become an efficient future emotional forecaster is to consult *surrogators*: people who have had previous experience with the event and can thus advise the person who is forecasting their reaction to a similar experience. For example, people who are wondering how they will feel following a romantic relationship breakup can consult a surrogator who previously experienced a breakup to make more accurate predictions about their likely reaction. However, according to Gilbert (2007), there are three innate human traits that prevent people from absorbing the advice of others. First, people tend to fall victim to the *better-than-average effect*: people usually think of themselves as more moral, more physically attractive, and more intelligent than the average person. Second, people tend to have a bias that they are unique, and therefore others' experience will simply not apply to them. Third, people tend to believe that other people are unique as well, and therefore their experiences will be vastly distinctive. Thus, the three innate social biases prevent people from successfully



utilizing Gilbert's suggested surrogator advice method for increasing the accuracy of affective forecasts.

Thus, it seems that people reject a seemingly efficient method to improve forecasting accuracy to lessen irrational decision making. Are humans then forever trapped in being inefficient forecasters? Not necessarily. The goal of the present research was to gain a deepened understanding of affective forecasting in an attempt to guide the development of low-cost, "portable" interventions to improve forecasting accuracy by capitalizing on the efforts of previous work on happiness.

### **Subjective Happiness and Forecasting Accuracy**

Some research indicates that happy people are more successful in a variety of ways than their less happy counterparts (Lyubomirsky & Layous, 2013). Other research suggests that people who forecast accurately are similarly more successful than their less-accurate counterparts (Gilbert, 2007). Thus, the goal of the proposed research is to bridge the research on happiness and affective forecasting to examine a possible relationship between subjective happiness and affective forecasting. That is, are happy people better forecasters? If so, does making people happier turn them into better forecasters? We present two studies that examined whether people with higher level of happiness are better at affective forecasting (Study 1) and tested whether people who underwent a happiness-inducing intervention become better forecasters than people who did not (Study 2).

***Hypothesis 1:*** Happier people will be more accurate in their affective forecasts.

Previous research has indicated that there are substantial benefits of happiness. For example, Lyubomirsky & Layous (2013) showed that happier people are more likely to live longer, be healthier, be successful at work, and have more relationship satisfaction. Additionally, happier people have more psychological resources than their less happy counterparts. Fredrickson's (2003) *broaden and build theory of positive emotions* argues that experiencing frequent positive emotions (happiness, peace, joy, serenity, etc.) can boost people's mental strength and resources (i.e., knowledge, creativity, and resilience). Lastly, there is a robust relationship between happiness and optimism, such that happier people tend to be more optimistic than their less-happy counterparts.

Optimism, in turn, may play an essential role in affective forecasting. To illustrate, one study compared assistant professors who received and were denied tenure and found that these groups reported similar levels of happiness within five years after the tenure decision. Therefore, the accurate forecast is that assistant professors will be happy regardless of their tenure decision (Wilson & Gilbert, 2003). One can imagine that an assistant professor who is less dispositionally optimistic would predict that they will experience negative emotions for a long period of time if they fail to get tenure, which would exaggerate the extent of their impact bias. However, assistant professors who are more optimistic might anticipate that their mental resiliency will kick in and aid them through the denial process, and thus their forecasts would be more accurate. Since research has long established that subjective happiness has a robust relationship with optimistic outlook, it is probable to predict that happiness and forecasting accuracy would be empirically related.

**Hypothesis 2:** People who undergo a happiness-promoting intervention will be more accurate in their affective forecasts.

Although less intuitive, making someone happier may be helpful in terms of increasing their accuracy in affective forecasting. As previously stated, optimistic people are more likely to be accurate in their emotional forecasts, and happier people are more likely to be optimistic than their non-happier counterparts. Thus, if established interventions increase people's happiness, they may simultaneously increase people's optimism and forecasting accuracy.

## **Overview**

In this paper, we present two studies to test our hypotheses. Study 1 took a correlational approach and examined links between several measures of happiness and forecasting accuracy. In Study 2, we randomly assigned people to undergo one of two happiness interventions or a control intervention in an effort to establish a causal link between happiness and forecasting accuracy.

## **Study 1**

### **Method**

**Participants.** 500 mTurk participants (48.64% males, 50.39% females, 0.03% identified as other;  $M_{\text{age}} = 35.46$ ,  $SD = 11.20$ ; 76.35% White/Caucasian, 8.01% Black/African American, 7.64% Asian, 0.93% Native Alaskan or Native American, 6.52% Hispanic/Latino, and 0.53% identified as others) participated in this study. The mTurk website is an online open-survey method through which qualified consumers can

participate in surveys to earn wages. Participants within this study were compensated with \$1 per survey completion.

**Procedure and measures.** Participants first filled out their demographic information and completed seven well-being measures: 1) the Satisfaction with Life Scale (Diener, Emmons, Larsen & Griffin, 1985); 2) the Subjective Happiness Scale (Lyubomirsky & Lepper 1999); 3) the Flourishing Scale (Diener et al, 2009); 4) the Life Orientation Task-Revised, measuring dispositional optimism (Carver, Scheier, & Segerstrom, 2010); 5) the Dispositional Positive Emotion Scales (Shiota, Keltner, & John, 2006); 6) state positive emotions (happy, pleased, joyful, enjoyment/fun); and 6) a one-item measure of state happiness (Gilbert, Pinel, Wilson, Blumberg & Wheatley, 1998).

Next, all participants indicated whether they were currently in a romantic relationship. Participants in a relationship indicated the length of that relationship, and participants not in a relationship predicted their emotional response to entering a relationship after 1 year, 5 years, and 10 years using the one-item state happiness measure. All participants then indicated whether they have ever experienced a significant breakup. Participants who had experienced a breakup indicated when the breakup occurred; those who had not experienced a breakup predicted their emotional response to a breakup after 1 year, 5 years, and 10 years, again using the one-item state happiness measure.

To evaluate forecasting accuracy, we compared the forecasts of those who were not in a relationship ( $n = 120$ ) to the true happiness of people in a relationship for approximately one year (between 8-16 months,  $n = 34$ ), five years (53-67 months,  $n =$

31), and 10 years (107-133 months,  $n = 33$ ). Similarly, we compared the forecasts of those who had never had a significant breakup ( $n = 120$ ) to the true happiness of people who had experience a breakup approximately one year ago (between 8-16 months ago,  $n = 29$ ), five years (53-67 months ago,  $n = 36$ ), and 10 years (107-133 months ago,  $n = 29$ ). All data were analyzed using SAS 9.4.

## Results

Out of the entire participant pool, 30% of participants were currently single and 24% had never experienced a significant breakup. We did not find evidence for the impact bias for forecasts of happiness after entering a relationship, such that single participants tended to actually underestimate their happiness in this event (the opposite of an impact bias) at one year,  $t(150) = 2.55, p = .01$ , five years,  $t(150) = 2.71, p = .008$ , and 10 years,  $t(150) = 2.16, p = .03$ , compared to participants in relationships of those lengths. Thus, we did not test *Hypothesis 1* in this group, given that they did not show an impact bias.

In contrast, the impact bias was present within the participants who were predicting how sad they would feel upon experiencing a breakup. Participants underestimated their happiness from a breakup at one year,  $t(119) = 9.96, p < .0001$ , five years,  $t(119) = 3.78, p = .0002$ , and 10 years,  $t(119) = 2.75, p = .007$ , compared to participants who had experienced a breakup within those timeframes (see Appendix I, Figure 1).

When assessing happiness and well-being as predictors of forecasting accuracy after experiencing a breakup, significant results were detected across the six well-being measures. We first created an accuracy score for each of the relevant participants by

subtracting the actual happiness in the comparison group from happiness forecasts at each of the forecast points (one year, five years, 10 years). We then averaged those difference scores into an accuracy composite. As hypothesized, bivariate correlation analyses between well-being measures and accuracy showed that accuracy was associated with satisfaction with life,  $r(120) = .42, p < .0001$ ; subjective happiness,  $r(120) = .44, p < .0001$ ; flourishing,  $r(120) = .52, p < .0001$ ; dispositional positive emotion,  $r(120) = .53, p < .0001$ ; dispositional optimism,  $r(120) = .44, p < .0001$ ; and state positive emotions,  $r(118) = .40, p < .0001$ .

## **Discussion**

In contrast to previous findings with undergraduates (Gilbert et al, 1992), the impact bias was not present in participants' prediction of happiness upon entering a relationship. However, aligned with previous research, the impact bias was detected in participants' prediction of unhappiness following a breakup (Gilbert et al, 1992). Furthermore, consistent with *Hypothesis 1*, participants who predicted their unhappiness levels accurately after 1 years, 5 years, and 10 years following a breakup also tended to be higher in well-being.

However, the major limitation within Study 1 was that the methodology was purely correlational. Thus, it remains unclear whether happy people are better forecasters, or those who forecast more accurately are happier. Another concern was the inability to test a mediating effect of optimism, given the correlational nature of the study. Previous research has established a robust connection between happiness and optimism. Since forecasting happiness is similar to having an optimistic outlook about the future, this study did not address whether the forecasting accuracy were a result of happiness and

well-being alone—or instead, that happier people were more optimistic and therefore their positive outlook predicted they were not going to be unhappy for a lengthy period of time following a breakup. Study 2 addresses this gap by randomly assigning participants to interventions designed to increase their happiness, thus permitting causal conclusions.

## Study 2

### Method

**Participants.** 129 undergraduate students from the University of California, Riverside (25% males and 65% females;  $M_{age} = 22$ ,  $SD = 5.07$ ; 15% White/Caucasian, 6% Black/African American, 38% Asian, 1% Native Hawaiian/Pacific Islander, 1% Native Alaskan or Native American, 38% Hispanic/Latino, and 1% identified as others) participated in this study. The students were compensated with 1% extra credit in addition to their overall class grade.

**Procedure and measures.** Similar to Study 1, participants first filled out their demographic information and completed the same six baseline well-being measurements at the beginning of the course. Participants then were randomly assigned to one of three conditions (approximately  $n = 40$  in each condition), based on previous work testing the effective of various happiness interventions (Lyubomirsky & Layous, 2013). In each condition, participants were prompted three times a week for three weeks (prior to their first midterm) to complete a “positive activity” (referred to as such to reduce demand characteristics): (1) *counting blessings*, in which participants were instructed to “write about the many things in [their] life, both large and small, that [they] have to be grateful about” (Sheldon & Lyubomirsky, 2006); (2) *savoring the present moment*, in which participants used their five senses to relish daily moments (Sheldon & Lyubomirsky,

2006); or (3) *neutral control activity*, in which participants simply described the activities they did that day (Sheldon & Lyubomirsky, 2006). We included two happiness interventions rather than a single intervention group to ensure that any effects were not due to idiosyncrasies of a particular activity. Following the middle (5<sup>th</sup>) and final intervention prompts, participants again completed measures of well-being.

One day after the final intervention prompt (one day prior to the first midterm exam), participants completed the affective forecasting measure. First, participants were asked to report what they would consider a “good grade” and a “bad grade” on the upcoming midterm exam. Participants were then asked to predict their emotional response with the current happiness item to each of those two outcomes (“How happy will you feel 1 day after receiving your grade if you get a [bad / good] grade on the exam?”). One day after grades were posted, participants completed a final questionnaire that asked them to report their grade on the exam and how happy they felt.

## **Results**

We analyzed the data in three steps. First, we examined the existence of an impact bias when forecasting happiness in response to good and bad grades, comparing students’ prediction of how they will feel after receiving a bad or good grade to the reported happiness of students who actually received grades lower than their stated definition of a bad grade or higher than their definition of a good grade. Second, we examined the effect of the happiness interventions on students’ forecasting accuracy. Lastly, we examined the characteristics of the students who accurately forecasted their emotional reaction to a good or bad exam grade.



Only a small number of participants ( $n = 17$ ) received a bad grade (according to their subjective standards of a bad grade). Therefore, we did not have adequate statistical power for our planned analyses and do not consider the bad-grade group further.

In contrast, 57 participants received a good grade (according to their subjective standards of a good grade). A paired samples t-test examined whether students who received a good grade showed an impact bias. In fact, we found a strong impact bias in these participants,  $t(56) = 5.34, p < .001$ , Cohen's  $d = .79$ . Students significantly overestimated their potential happiness after having received a good grade ( $M = 6.02, SD = 1.11$ ), which differed from their actual happiness after having received a good grade ( $M = 4.99, SD = 1.46$ ; see Appendix II, Figure 2).

Next, we tested the effectiveness of the happiness interventions for improving students' forecasting accuracy following receipt of a good grade. We conducted a series of paired samples t-tests to compare the forecasts and actual happiness within each intervention group. Within the *counting blessings* group, there was a significant difference between predicted and actual happiness levels,  $t(15) = 3.18, p = .006, d = 1.64$ . Students who engaged in the counting blessings activity significantly exaggerated their happiness level in response to a good grade ( $M = 6.50, SD = .82$ ) compared to their happiness level after receiving a good grade ( $M = 5.14, SD = 1.68$ ). Within the *savoring the present moment* group, there was also a significant difference between predicted and actual happiness levels,  $t(10) = 3.35, p = .007, d = 2.12$ . Students who engaged in the savoring the present moment activity significantly exaggerated their happiness level in response to a good grade ( $M = 6.18, SD = .87$ ) compared to their happiness level after receiving a good grade ( $M = 4.54, SD = 1.56$ ). Within the control activity group, there

was also a significant difference between predicted and actual happiness levels,  $t(26) = 2.73, p = .01$ , Cohen's  $d = 1.07$ . Students who listed what they did in the past 24 hours significantly exaggerated their happiness level in response to a possible good grade ( $M = 5.63, SD = 1.28$ ) compared to their happiness level after receiving a good grade ( $M = 5.04, SD = 1.37$ ; see Appendix III, Figure 3). Thus, participants showed an impact bias across intervention groups.

Finally, we examined relationships between trait well-being markers and forecasting accuracy within the good group, after first creating an accuracy score by subtracting participants' actual happiness following a good grade from their happiness forecast. Bivariate correlations revealed significant negative correlations between the impact bias and subjective happiness,  $r(57) = -.30, p = .02$ ; satisfaction with life,  $r(57) = -.30, p = .02$ ; dispositional optimism  $r(57) = -.36, p = .007$ ; flourishing,  $r(57) = -.37, p = .004$ ; and dispositional positive emotions (marginally significant),  $r(57) = -.24, p = .07$ .

**Discussion.** Study 2's results showed the existence of the impact bias when forecasting happiness following a good grade. This finding aligns with previous research showing that people have the tendency to overly exaggerate their happiness in terms of the duration and the intensity following a positive event (Gilbert et al, 1992). Study 2's results indicated that behavioral interventions designed to increase students' happiness levels did not eliminate the impact bias; if anything, it further exaggerated students' impact bias when forecasting happiness in response to a positive outcome. Although we did not hypothesize this result, it aligns with previous research showing that happier people are generally more optimistic (Lyubomirsky & Layous, 2013). Therefore, happiness interventions may have increased their expectation of experiencing happiness

without increasing their actual happiness in the face of good news. Lastly, Study 2's results indicated that happier students were more accurate in the forecasts than their less-happy counterparts, consistent with Study 1. Happier people tend to have a higher happiness baseline (Lyubomirsky, King, & Diener, 2006). Thus, perhaps these happy people were able to rise to the level of their predicted happiness following a good grade.

### **General Discussion**

Overall, we found some support for our hypotheses. In both studies, we found an impact bias for some forecasts, consistent with *Hypothesis 1*—forecasts of a breakup in Study 1, and forecasts of a good grade in Study 2. More central to the goal of this paper, we found clear evidence for *Hypothesis 2*. Within the people who forecasted their happiness following a relationship breakup in Study 1, happier people were more accurate in their forecasting. Similarly, happier people were more accurate in terms of their forecasting their reaction to a good exam grade in Study 2.

Despite these encouraging findings, we were surprised to see a reverse impact bias in Study 1 among those predicting happiness in response to entering a relationship. That is, people underestimated their happiness after one, five, and 10 years after entering a relationship, as compared to people in relationships of these lengths. A majority of the participants were middle-aged in this study ( $M_{\text{age}} = 35.46$ ,  $SD = 11.20$ ). Middle-aged participants are likely to have accumulated more experience relationship enters than previously tested undergraduate students (Gilbert et al., 1998). Thus, middle-aged participants may not fall into the impact bias trap to overly predict their happiness upon entering into a romantic relationship, which could explain the non-existence of the impact bias for participants forecasting this event in our study. Previous research indicates that

“rejection and failure always hurts” (Duckworth & Yeager, 2015), which may explain the continual existence of the impact bias for breakups regardless of accumulated experience.

We also failed to find support for *Hypothesis 3*; instead, the happiness interventions in Study 2 seemed if anything to exaggerate students’ impact bias when forecasting their reaction of a good grade, largely because they forecasted particularly extreme levels of happiness. We believe the interventions increased people’s optimistic outlook of forecasting happiness following a good grade. Thus, the intervention did not seem to work in terms of increase forecasting accuracy.

### **Limitations**

Both studies’ findings suffer under the lack of participant representation. Study 1 included mostly middle-aged participants, and not the age of typical undergraduate students. Study 2 included all ages from the undergraduate student population, but not middle- to old-aged participants. The inconsistency in age across the two studies may have contributed to inconsistent results across studies. To solve this limitation, all age groups should be included in future research.

Additionally, both studies’ data were drawn from self-reported measures, which could run into limitations such as response biases or socially desirable responding (Sanford, Theommes, & Rosenthal, 2014). To solve this limitation, future studies could use neurological or physiological measures (e.g., EEG, fMRI, cortisol reactivity) to supplement or replace self-report measures.

### **Future Directions & Conclusion**

Our studies lay the foundation to test other potential moderators of affective forecasting accuracy (e.g., mindfulness and mindset) and moderators of specific

forecasting biases (focalism, projection bias, and immune neglect). The ultimate goal is to develop and validate a theory of forecasting accuracy that includes predictors, mechanisms, and consequences of accuracy. Additionally, cross-cultural differences in affective forecasting among the diverse participants can be examined to ensure generalizability. Findings from the current and future studies will contribute to new and deepened understanding of affective forecasting and will guide the development of low-cost, “portable” interventions to improve forecasting accuracy. These findings will also contribute to well-being science more generally by identifying links between well-being constructs.

#### **Declaration of Conflict Interests**

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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#### **Supplemental Material**

All study materials are available upon request.

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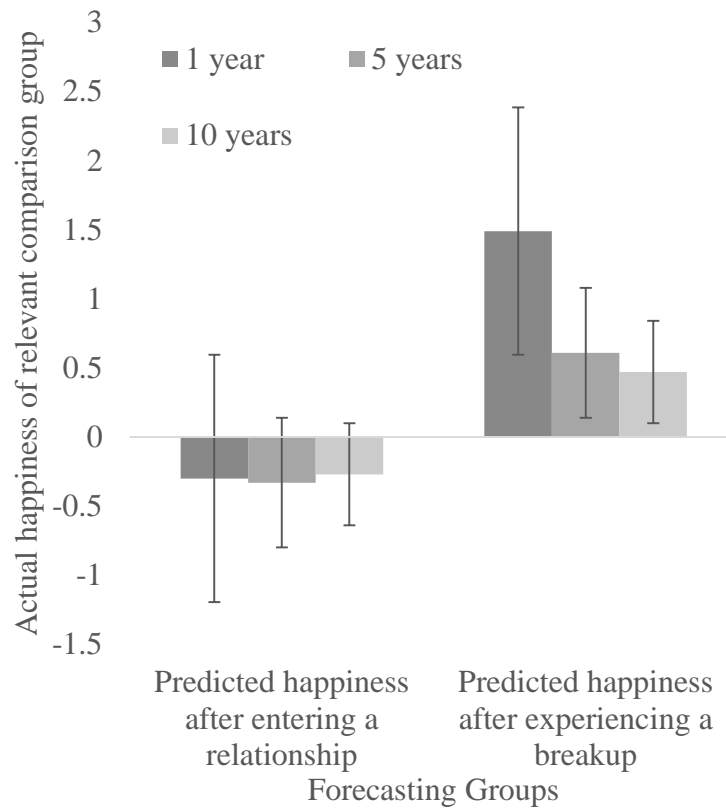
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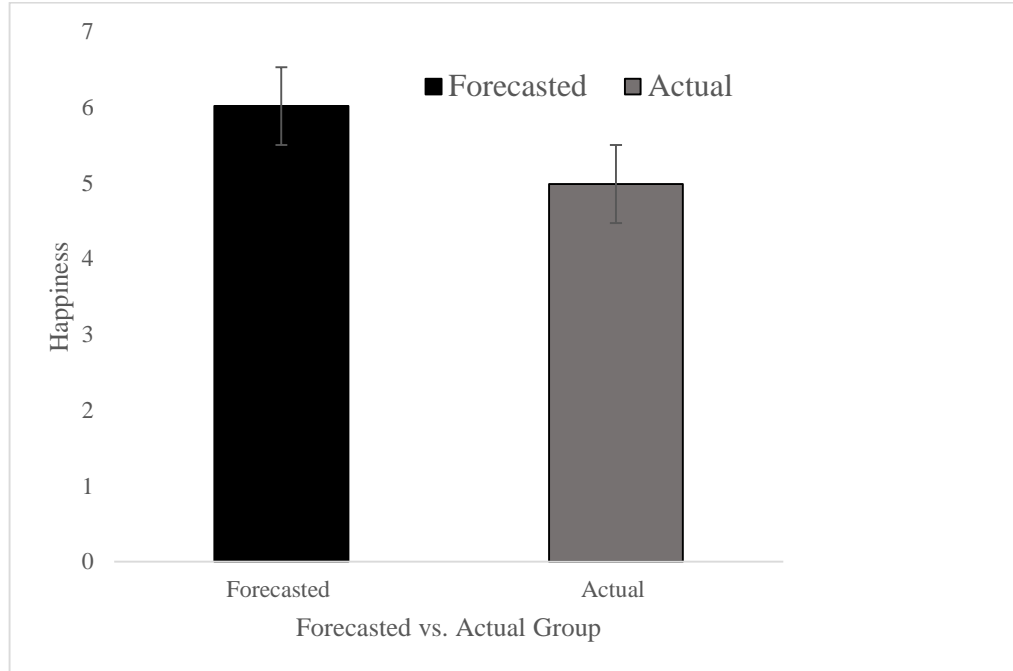


## Appendix I



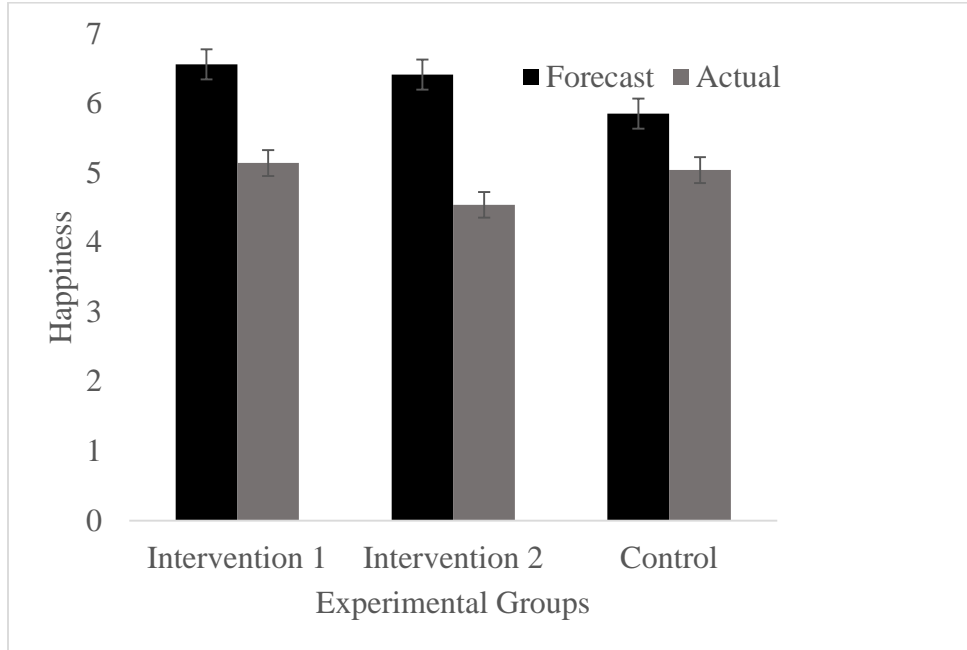
*Figure 1.* Mean difference values representing mTurk participants' forecasted happiness either after entering a relationship or after experiencing a breakup. 95% confidence intervals are represented in the figure by the error bars attached to each column.

## Appendix II



*Figure 2.* State happiness level comparison between undergraduate participants' forecasted happiness and actual happiness after receiving a good exam grade, among those who did receive a good exam grade. 95% confidence intervals are represented in the figure by the error bars attached to each column.

### Appendix III



*Figure 3.* State happiness level comparison between the intervention groups and the control group. The graph illustrates undergraduate participants' forecasted happiness and actual happiness after receiving a good exam grade, among those who did receive a good exam grade. The data showed the happiness interventions exaggerated students' positive forecast than the control group, which in turn exaggerated presence of the Impact Bias. 95% confidence intervals are represented in the figure by the error bars attached to each column.