

2010

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Bachmann, O.

Bachmann, O. (2010) 'Predicting future happiness: an attempt to determine factors underlying the impact bias', The Plymouth Student Scientist, p. 60-85.

<http://hdl.handle.net/10026.1/13895>

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The Plymouth Student Scientist  
University of Plymouth

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# **Predicting future happiness: an attempt to determine factors underlying the impact bias**

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## **Abstract**

People tend to overestimate their affective reactions to emotional events, exhibiting the so-called impact bias. One factor underlying this bias is a cognitive mechanism known as focalism, the tendency to focus too narrowly on the event in question. The current study investigates two exercises designed to reduce focalism: A prospective diary, and a similar-past experiences exercise. Neither of these exercises led to the expected results. Furthermore, the data suggest that the impact bias may be affected by the temporal distance of focal events. These results are discussed in the context of other relevant research.

### *Ethical Statement*

I received ethical clearance before I started to collect the data. All participants gave their informed consent by clicking the appropriate box on the internet website.

All data were collected by myself, using an internet website.

### *Acknowledgements*

First of all, I thank Mat White for his amazing supervision. His enthusiasm in general, and his trust and interest in my work in particular, were well received. I want to thank my mum, who was there for me throughout the whole three years. Her constant trust and support are very important to me. I thank Chrissie, Lisa, and Henning for supporting me during the write-up process. I thank Konrad, who shares my passion for Psychology and who was a true companion during the course. I thank Marc Cooper, for providing me with the technical help I desperately needed to manage my on-line study. Finally, I want to thank Dan Gilbert, Tim Wilson, Peter Ubel, Andrea Rid and Kent Lam for taking time to answer my e-mails.

## **1. Introduction**

People know what is best for them, and they are generally able to choose what is best for them. This assumption is not only integral to classic economics, but it is shared by Western societies in general (Hsee & Hastie, 2005).

Almost all actions people engage in are eventually grounded in the hope that they will lead to greater happiness (Canova, Ratazzie, Webley, 2005). Therefore, choosing “what is best for them” can be defined as choosing what will make people happy.

But, is the assumption, that people know what will make them happy, really true? Recent research has shown that when imagining the future, people are prone to a number of systematic errors. The current report will start with briefly outlining some of these errors. Then, the perhaps most prominent error, the so-called impact bias, will be discussed in greater detail. Cognitive mechanisms responsible for this bias are mentioned, and methods which could ameliorate it are considered. Lastly, the impact bias is related to the “temporal construal theory” (Liberman & Trope, 2003), before the present study and its hypotheses are outlined.

### *1.1. Affective forecasting*

Before making a decision, people imagine how this decision will make them feel. That is, they make “affective forecasts”. These affective forecasts are then guiding the decision process (Baron, 2008; Loewenstein & Frederick, 1997; Hsee, 2006; Gilbert & Wilson, 2007; Kassam, Gilbert, Boston, Wilson, 2008, study 3; Wilson & Gilbert, 2003, Mellers & McGraw, 2001). If these affective forecasts are biased, this may have implications for the decisions people make.

One way of studying affective forecasts is to ask participants how they think they will feel at a certain day (here this day will be termed target day) after a certain event (focal event) has taken place.

## **1.2. Biases in affective forecasting**

There are several reasons why affective forecasts can be biased. People may overestimate the degree to which their future mood will resemble their current mood. (Loewenstein, O'Donoghue, Rabin, 2003). People in bad moods may predict greater happiness than reasonable, in order to enhance their current feelings (Buehler, MacFarland, Spyropoulos, Lam, 2007). Or people may have wrong beliefs of what will make them happy (Hsee, 2006); for example people may mistakenly believe that more choice is always better (Iyengar & Lepper, 2000; Botti & Iyengar, 2000), or they may mistakenly believe that being able to change a decision will lead to greater satisfaction (Gilbert & Ebert, 2002).

Intuitively, it may seem that an easy way to circumvent these biases may be to base forecasts on previous experiences. However, memories are often biased, too. For example, people tend to remember extreme experiences most readily (Tversky & Kahneman, 1974). Extreme experiences also tend to be the least representative ones (Morewedge, Gilbert, Wilson, 2005). Furthermore, when remembering the past, people may neglect the duration, but instead remember the peak and the end of the experience (Kahneman, Frederickson, Schreiber, Redelmeier, 1993). And, people may also remember past emotional reactions as being more extreme than they actually had been (Wilson, Meyers, Gilbert, 2003; Levine, Safer, Lench, 2006).

## **1.3. The impact bias**

The most prevalent bias in the affective forecasting literature is the so-called impact bias (Buehler & McFarland, 2001; Gilbert et al., 1998; Mellers & McGraw, 2001; Mitchell, Thompson, Peterson, Cronk, 1997; Rachman & Arntz, 1991; Schkade & Kahneman, 1997; Wilson, Wheatley, Meyers, Gilbert, Axsom, 2000; Brickman, Coates, Janoff-Bulman, 1978). The impact bias refers to people's tendency to overestimate the emotional consequences any given event will have on their emotions. This includes overestimating the intensity (Buehler & McFarland, 2001) and the duration (Wilson et al., 2000) of emotions associated with the focal event.

The impact bias has been shown for a great variety of focal events, such as break-ups of romantic relationships (Gilbert, Wilson, Pinel, Blumberg, Wheatley, 1998), passing or failing a driving test (Aynton, Pott, Elwakili, 2006), monetary losses or wins through gambling (Kermer, Driver-Linn, Wilson, Gilbert, 2006), Christmas (Buehler & McFarland, 2001), disabilities (Ubel, Jepson, Loewenstein, 2005), and the outcome of HIV tests (Sieff, Dawes, Loewenstein, 1999).

To this day, researchers have identified two main cognitive mechanisms which underlie the impact bias: Immune neglect and focalism.

## **1.4. Immune neglect**

Immune neglect refers to people being unaware of cognitive processes which attenuate negative affect (these cognitive processes were termed the "psychological immune system", Gilbert et al., 1998). These cognitive processes include the processes of rationalising negative events. When forecasting feelings for a negative event, people do not take these processes into account, which leads to overly pessimistic forecasts (Gilbert et al., 1998, Wilson et al., 2003).

## **1.5. Focalism**

The other main mechanism underlying the impact bias was termed focalism (Wilson et al., 2000; Lam, Buehler, McFarland, Ross, Cheung, 2005) or focusing illusion (Schkade & Kahneman, 1998; Ubel et al., 2005). In contrast to immune neglect,

focalism plays a role in the impact bias for negative and positive affect. Focalism is defined as the phenomenon that people focus too narrowly on the focal event, while failing to consider that other occurrences will also influence their emotions (Wilson et al., 2000, Ubel et al., 2005).

Lam et al. (2005, study 3) demonstrated focalism in a within subjects design. They asked participants to nominate a specific positive event which was likely to happen within the following two weeks. Then, participants predicted how happy they thought they would be on a day in two weeks time, after the focal event had taken place. Participants also rated how much they focused on the focal event and how much they focused on other events, when they had made their forecasts. After two weeks, participants reported their general happiness level. Results firstly showed that participants made too extreme (too optimistic) happiness predictions, exhibiting the impact bias. Secondly, the focalism measure and happiness predictions correlated strongly, those participants who reported that they had focused narrowly on the focal event also made more extreme happiness forecasts.

### **1.6. Defocusing exercises**

There are two main reasons why techniques used to decrease focalism are useful. The first reason is a theoretical one: If it can be shown that decreasing focalism also decreases the impact bias, this is experimental evidence for a cause-and-effect relationship, indicating that focalism causes the impact bias. Secondly, finding a method to decrease the impact bias can be useful in real life contexts. It could potentially help people in decision-making (Dunn & Laham, 2006).

Wilson, Wheatley, Meyers, Gilbert and Axsom (2000) introduced an exercise designed to circumvent focalism, thus moderate the impact bias. In this study, football fans from Virginia were asked to forecast their happiness following a win and a loss after a football game. Some participants completed a "prospective diary". The prospective diary was labelled as an unrelated study, in which participants rated how much time they would spend on ten everyday activities (e.g. socialising, studying) on a specific day two months in the future. This day was after the football game. Further, participants in the diary condition indicated one activity for every hour of the day (0am-12pm) which they were likely to be engaged in. Then all participants predicted how happy they would be after the football game. Virginia won. Then, participants reported their experienced happiness.

Participants in the diary condition made less extreme happiness predictions, they showed a significantly reduced impact bias compared to those participants who did not complete the diary procedure. Reminding people about the everyday activities they will engage in moderated their happiness predictions.

Lam et al. (2005) are, to this day, the only researchers who have successfully replicated the diary procedure (Wilson, 2009, e-mail communication). In their study, participants were asked to nominate a specific positive event which was likely to happen within the following two weeks. Then, participants in the diary condition filled in a diary procedure, whereas participants in the control condition went straight on to make their affective forecasts (Lam et al., 2008, e-mail communication). Participants in the diary condition wrote down one activity in which they were likely to be engaged in for each hour of the day (12am-11pm), and then indicated whether this activity was positive, neutral or negative.

All participants made their happiness predictions for the target day in two weeks time. They also rated the extent to which they had focused on the focal event while making their forecasts. People's experienced happiness ratings were not

followed up.

Results indicated that people who focused more on the focal event made more extreme happiness predictions. There was a small but significant effect for the diary condition. People in the diary condition tended to focus less on the target event and, therefore, made more moderate predictions.

There were several weaknesses associated with this study. In the control condition participants went from answering some characteristics about the target event straight to predicting happiness. Therefore, the shorter time span between nomination of target event and happiness predictions for the control condition may have contributed to the more extreme happiness predictions in the control condition. Secondly, no follow-up measures were obtained. Considering the rather small or even marginal effects from this study, including a filler task in the control condition or obtaining follow-up measures may have led to the results that the diary condition does not reduce the impact bias significantly.

These two studies (Wilson et al., 2000; Lam et al., 2005) fulfil two purposes. Firstly, they show experimentally that focalism has a causal effect on the impact bias. Secondly, they suggest methods which could potentially be used to decrease the impact bias.

Ubel et al. (2005) introduced another potential approach to reduce the impact bias. This approach was grounded in the idea that people may exhibit focalism because they underappreciate the speed at which they adapt to positive or negative life experiences. Ubel et al. (2005) reasoned that this may be reduced by reminding participants about how they had previously adapted to previous life experiences.

It is a well established phenomenon that healthy people overestimate the impact a disability has on Quality of Life (QoL), when compared to ratings of people who actually suffer such a disability (Sackett & Torrance, 1978; Riis et al. 2005; Boyd, Sutherland, Heasman, Trichler, Cummings, 1990, Ubel, Loewenstein, Jepson, 2003). Ubel et al. (2005) asked participants to make QoL estimates for a life with a disability. Before doing that, some participants engaged in an exercise which was designed to decrease focalism by reminding people about how they had adapted to previous life events. Participants were asked to consider previous difficult life experiences and how their emotions towards them had changed over time. Also, participants noted which activities they would engage in to cope with paraplegia, whether they would be able to cope better than the average person and whether they thought the experience would become more or less upsetting over time. This manipulation moderated affective forecast, leading to presumably more realistic QoL ratings. As no focalism measures were attained, it cannot be said whether focalism really mediated the results.

### **1.7. Defocusing exercises and specificity**

Not all defocusing techniques tested so far were successful. For example, Ubel et al. (2005) tested a defocusing exercise which asked participants to rate how much eight everyday events (e.g. visiting with friends and/or family, paying bills and taxes) would be affected by paraplegia. Then, participant made their predictions for QoL with paraplegia. This exercise did not moderate affective forecasts.

Ayton, Pott and Elwakili (2007) hypothesised that the defocusing method used by Ubel et al. (2005) described in the previous paragraph had no moderating effect because it was too broad. Testing the hypothesis that defocusing is dependent on the specificity of the task, Ayton et al. (2007) asked participants to predict general happiness for a hypothetical person who was either diagnosed with HIV, or won the

lottery. They compared one broad and one concrete defocusing method. The broad, or high-level, defocusing exercise was similar to the one by Ubel et al. (2005). Participants rated how much 18 everyday activities (e.g. talking with a friend, buying clothes) would be affected by the condition (HIV/winning the lottery). The concrete, or low-level, exercise asked participants to listen to a detailed and specific description of a day in one of the hypothetical person's lives. As predicted, only the concrete, low-level exercise moderated forecasts.

Broader categories leave space for participants to think about the aspects which are affected; for example when thinking about "talking with a friend", participants may think about those aspects of this experience that are affected by the condition. Participants may imagine how the friend pities them for being diagnosed with HIV, or how s/he will invite the friend to an expensive dinner after having won the lottery. Specific categories however (e.g. talking to a friend about the weather) are more difficult to interpret under the heading of a HIV diagnosis or a lottery win.

Besides offering an explanation why Ubel et al.'s (2005) defocusing exercise did not work, Ayton et al. (2007) results link focalism to temporal construal theory.

### **1.8. Temporal construal theory**

Temporal construal theory (Trope & Liberman, 2003) states that cognitive representations, or construals, of distant-future events are different to those of near-future events. Distant future events are represented in high-levels construals, and near future event in low-level construals. High-level construals consist of essential information, are coherent, simple, and do not include detailed, incidental or contextual information. Low-level representations include specific, incidental, and contextual information (Trope & Liberman, 1998). For example, when thinking about moving apartments next year, this may be described as "starting a new life". When the same occurrence, namely moving, is happening tomorrow, people may describe it as "packing and carrying boxes" (Liberman & Trope, 1998).

As noted above, focalism is defined as focusing heavily on the occurrence in question, while neglecting other occurrences. Focalism research has shown that one reason why people exhibit the impact bias is that they fail to incorporate non-schematic, detailed, and contextual information into their representations of the time after the focal event. Reminding people of these contextual details reduces focalism (Wilson et al., 2000, Lam et al., 2005, Ayton et al., 2007). Research on temporal construals has also shown that people neglect contextual and incidental features when thinking about the distant future. For example, when thinking about the time they will engage in academic activities next year, students neglect how many other activities will fill their schedules, focusing narrowly on the activity in question (e.g. academic studying; Liberman & Trope, 1998).

Therefore, temporal construal theory and focalism seem highly related, as both, high-level construals and focalism can be seen as people neglecting context information, and focusing on the values associated with the high-level construals of the focal event. As Wilson et al. (2000) put it, both focalism and high-level construals include people to think about the focal event in "more of a vacuum". It therefore has been suggested that people exhibit greater focalism, thus a greater impact bias, for distant- future compared to near-future events (e.g. Wilson et al., 2000).

### **1.9. The current study**

Determining factors underlying focalism could help constructing a defocusing method which could ultimately be used to improve decision making. Also,

determining which factors lead people to focus narrowly on a certain occurrence, can give greater insights in human perception, cognition and decision-making in general.

The present study tests two defocusing exercises: A diary-defocusing exercise which aims to decrease focalism by reminding people on occurrences which are unrelated to focus event; and a so called similar-past exercise, which aims to decrease focalism by reminding people on previous life experiences.

Furthermore, the current study investigates whether the temporal distance of the focal event is related to focalism and the impact bias.

Previous research has shown that focalism is a major mechanism underlying the impact bias for positive events (Wilson, 2000; Wilson & Gilbert, 2003), whereas the impact bias for negative events is also influenced by the so-called immune neglect (Gilbert et al., 1998). As the present study investigates factors influencing focalism, it seemed reasonable to use positive target events only.

### 1.10. The hypotheses

There were four main hypotheses. The first hypothesis stated that the impact bias would be observed. This is consistent with a large body of previous findings.

The second hypothesis stated that focalism ratings are correlated to happiness predictions, as already found by Lam et al. (2000).

The third hypothesis stated that the diary condition and the similar-past condition both decrease focalism, thereby the impact bias (see Figure 1). This hypothesis reflects that similar versions of the defocusing methods have previously been found to moderate the impact bias (Wilson et al., 2000; Lam et al., 2005; Ubel et al., 2005).

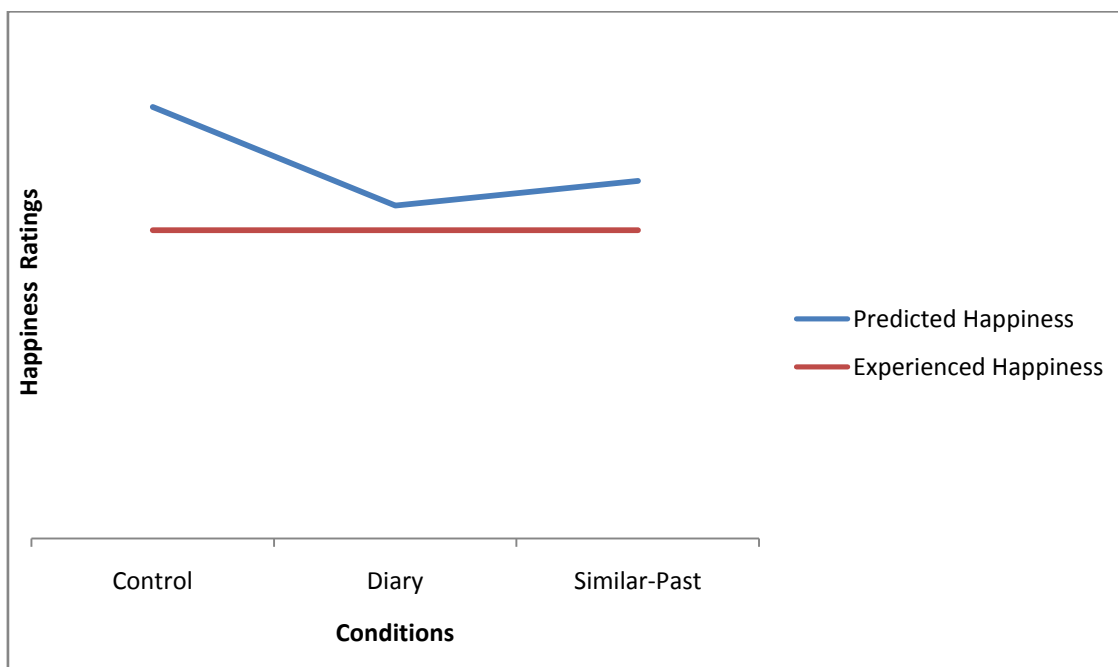


Figure 1. Predicted and experienced happiness ratings, as well as focalism ratings for all three conditions, as predicted by hypothesis three.



The fourth hypothesis states that the problem of focalism is greater for distant-future event. Therefore, it was predicted that the impact bias is more pronounced for distant future events than for near-future events (see Figure 2). This hypothesis is grounded in the temporal construal theory, which states that distant-future events are represented in a way which neglects contextual and incidental features.

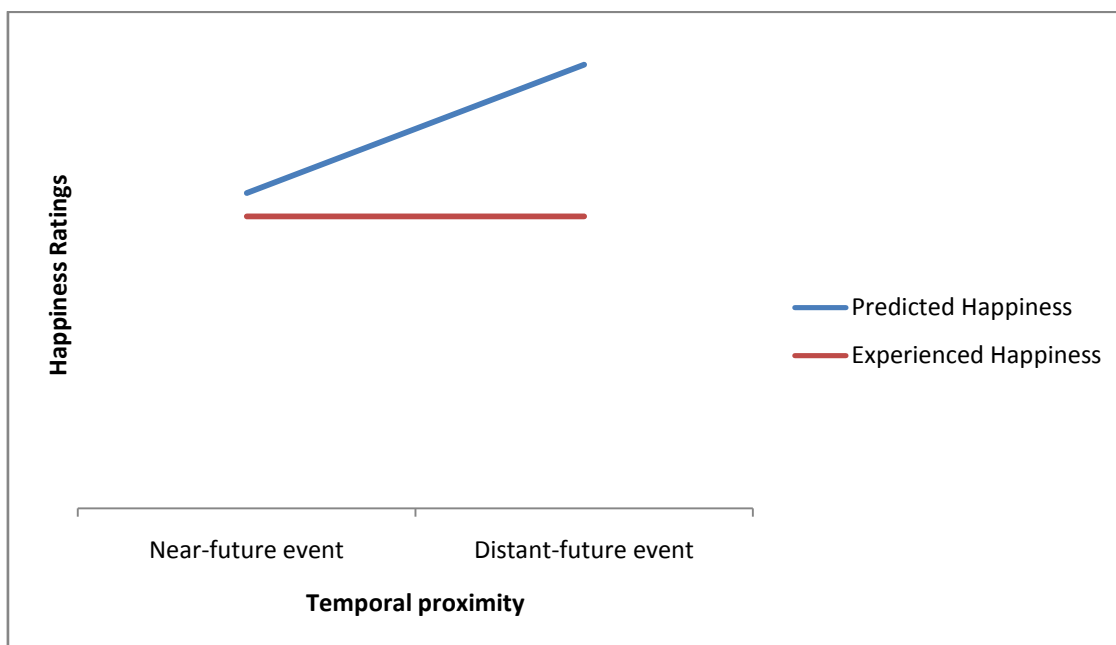


Figure 2. Predicted and experienced happiness ratings, as well as focalism ratings for near future and distant-future events, as predicted by hypothesis three.

## 2. Method

### 2.1. Participants

Initially, one hundred and nineteen participants completed both questionnaires. Fourteen participants were excluded from the analysis because they reported that they did not experience the focal event they had nominated. The final sample consisted of one hundred and five participants (72 women, 33 men). Thirty participants were Psychology undergraduate students from the University of Plymouth and participated for partial course requirements. All other participants were either acquainted with the experimenter or were acquainted with acquaintances of the experimenter. They participated voluntarily and no compensation was offered.

### 2.2. Materials

The questionnaire was made available through the internet website from the University of Plymouth. Participants used their individual computers for completing the questionnaires.

### 2.3. Design

A between-within subjects design was used. Participants were exposed to only one experimental condition. Allocation to conditions was randomised. Happiness ratings were taken three times (baseline, predictions and experienced).

The study was online. It consisted of several screens. Each screen contained one or more questions. Participants could only continue to the next screen after they had answered all questions of the current screen. It was not possible to go back to earlier screens.

Time and place of participation differed, as participants could decide for themselves when to log onto the internet website. Filling in the first questionnaire lasted approximately 10 minutes. The follow-up questionnaire consisted of five multiple-choice questions and the debrief, taking less than five minutes.

#### **2.4. Procedure**

Participants were invited by e-mail to take part in a “study about life events”. The e-mail contained a link which directed participants to an internet website. The link could be copied and pasted, therefore some participants may have received the link without the e-mail (e.g. through Instant Messengers). The internet website was designed in a way that the e-mail was not necessary to understand the experiment.

On the first screen on the website, participants were welcomed and thanked for participating. It was explained that the study would consist of two parts and that a second e-mail would be sent to them one week after completing the first part. Further, it was explained that the data were confidential and that they had the right to withdraw at any time. The e-mail addresses of the experimenters were provided. After participants gave their informed consent and entered their e-mail addresses, the study could be started.

On the second screen, participants reported their age, gender, baseline happiness and the day of the week. Baseline happiness was assessed with the one-item question “overall, how happy are you today?”. Participants answered on a 11 point scale, anchored with *not at all* and *extremely*. This one-item question was adapted from Lam et al. (2005). One-item measures of happiness are convenient to use, especially when using a repeated measures design. At the same time, they are reasonably valid and reliable, and they correlated highly with more elaborate measures (Sandvik, Diener, Seidlitz, 1993). One-item measures are commonly used in affective forecasting literature (e.g. Gilbert et al., 1998, Lam et al., 2000).

On the third screen, participants nominated a positive focal event. They read the following instructions “*I would like to ask you some questions about one specific, positive situation or event that will happen in the next 7 days. So, first I need you to think of some positive situation or event (i.e. something that you want to happen) that is likely to take place. Please list one specific positive event that will probably occur within the next 7 days in the space provided below.*” On the same screen, participants were then asked who would join them during the event, how long the event would last, how positive and how important the event was for them.

The next screen differed between participants, depending on the condition they had randomly been assigned to.

*Control condition:* Participants in the control condition were presented with a task which was designed to keep them engaged for approximately one minute. Participants were presented with a short text (six lines long) about a travel agency in India. They were asked to count how often the word “the” appeared in the text (six times). The text was taken from the Sunday times, and it was chosen because it was emotionally neutral.

*Diary Condition:* Participants allocated to the diary condition were presented with a prospective diary procedure similar to the one used by Wilson et al. (2000) and Lam et al. (2005). The procedure was designed to increase attention paid to

occurrences other than the focal event, which were likely to influence participants' feelings on the target day (Wilson et al., 2000; Lam et al., 2005). The following instructions were displayed: "*Consider next Monday. Please list one activity you are likely to be engaged in for each hour of the day (e.g. 11-12: having a lecture)*". The day (in the current example Monday) was changed according to the day on which participants would receive the follow-up e-mail. The screen entailed seven blank lines, in which participants wrote what they thought they would be doing at the given times (time frames given were 9-11am, 11am-1pm, 1-3pm, 3-5pm, 5-7pm, 7-9pm, 9-11pm). The time frames given were two-hour slots, although the task description asked participants to think of one event for every one hour. This was done because the aim was to get participants thinking about the activities they would engage in. However, it seemed like a long and rather difficult task to write down 12 prospective activities. Therefore, the exercise was shortened, in order to make it easier, and thereby hopefully decreasing the drop-out rate.

*Similar-past condition:* Participants in the similar-past condition received an exercise designed to increase attention paid to adaptation, and to similar-past experiences. The procedure was adapted from Ubel et al. (2005, study 2, narrow adaptation exercise). Ubel et al. (2005) asked participants to recall one negative and one positive emotional experience, and indicate whether their emotional reaction became stronger or weaker as time passed. In contrast to that, the current study asked participants to recall two events similar to the focal event.

The following instructions were displayed "*Please take a few moments to think about several other positive events and experiences that might be similar or relevant to the one that you have listed. Try to remember what those past events were like and how they generally made you feel. You might consider what generally happened in those types of events, and how you ended up feeling.*" Then, participants were asked to describe the last time they experienced a relevant event, and indicate whether their emotions towards the event got stronger or weaker over time (on a five-point scale). The same was repeated for the penultimate time participants had experienced a relevant event.

In contrast to Ubel et al. (2005), the current study asked participants to recall similar life events. This change was introduced because remembering past similar experiences seemed like a more natural approach. People were asked to note down two events, and these events were specified by the time they took place (the most recent events). This was chosen in order to avoid participants recalling the most extreme, therefore least representative events (Morewedge et al., 2005).

Afterwards, all participants predicted how they would feel one week later (*Assuming that the event you listed takes place, how happy do you think you will be overall next Monday*) on a 11 points scale (1= not at all happy, 11= extremely happy). Participants then answered some questions about how they made their happiness predictions, and about some event characteristics. Amongst others, participants rated how much they focused on the focal event when making their forecasts (e.g. *Please indicate how much you focused on the event you listed when making your happiness predictions, 1= not at all happy, 11= extremely*), and how much they focused on unrelated events (*Please indicate how much you focused on factors unrelated to the event, when you made your happiness predictions, 1= not at all happy, 11= extremely*). These two measures were previously used to by Lam et al. (2005) to obtain a measure of focalism.

On the last screen, participants were thanked for their time. They were reminded that they would receive a link for the follow-up questionnaire via e-mail in

one week's time, and that they would be debriefed after they completed the follow-up questionnaire. Also, participants were provided with the e-mail addresses of the experimenters in case they had any questions or they wanted to withdraw their data.

One week later participants received an e-mail containing a link which led to the follow-up questionnaire. When participants entered the homepage, on the first screen they were thanked for returning to the website and questionnaire. Then, they reported how happy they were (*Overall, how happy are you today?*) on the same 11 points-scale used in the first questionnaire. Participants were reminded of the event they had nominated, and were asked whether the event had taken place. Participants could choose between "Yes, it did", "A very similar event took place" and "No, it did not". The "A very similar event took place" option was included, in order to decrease the number of participants who answered that the event did not take place. It was reasoned that some people might answer that the event did not take place, because of an insignificant detail which was different from what they had expected.

People who answered that their focal event had not taken place, were directly forwarded to the last screen.

Participants who answered that the focal event had taken place, then answered when the focal event had taken place (*0-2days ago, 3-5days ago, 6-7days ago*). Also, it was asked if the event had unfolded as expected. Finally, participants were thanked again and debriefed. Participants were provided with a reference for a review article, in case they were interested in the background of the study.

Students who participated for partial course credit received their "participation points" after they had completed the second part of the study.

### 3. Results

#### 3.1 Preliminary Analysis

Analyses were carried out using the Statistical Package for Social Sciences (SPSS) for Windows 16.0. The Sobel statistic was calculated on the webpage <http://www.danielsoper.com/statcalc/calc31.aspx>.

##### 3.1.1. Comparability of Samples

The sample consisted of 105 participants. Only those people who completed both questionnaires, and who reported that the focal event took place, were included (Control condition,  $n=36$ ; Diary condition;  $n=36$ ; similar-past condition,  $n=33$ ).

Gender ratio, age, and baseline happiness were compared between experimental conditions. This was done to rule out that systematic differences between groups could have influenced the results. Gender ratios were similar in the control condition (75% female), diary condition (61% female), and similar-past condition (70% female),  $X^2(2, N = 105) = 1.64, p = .44, ns$ .

The data for age and baseline happiness were skewed (*skews*: 3.41 and -.69, respectively; see section 3.1.3). Homogeneity of variance was given in both cases ( $p > .1$ ). There were no significant age differences between conditions (control condition:  $M = 22, SD = 5.22$  vs. diary condition:  $M = 22.42, SD = 3.26$  vs. similar past condition:  $M = 23.48, SD = 7.68$ ),  $F(2, 102) = .63, p = .53, ns$ . Participants in all three conditions were of similar age.

Participants reported similar levels of baseline happiness (control condition:  $M = 6.97, SD = 1.87$  vs. diary condition:  $M = 7.36, SD = 1.85$  vs. similar past condition:  $M = 7.33, SD = 2.03$ ),  $F(2, 102) = .46, p = .64, ns$ . Therefore, the three samples consisted of people with similar baseline levels of happiness.

### 3.1.2. Comparability of focal events

Participants nominated a variety of positive events, for example buying a new laptop, handing in coursework, attending celebrations and parties or going home for Christmas.

To ensure that all groups nominated comparable focal events, five features (duration, positivity, importance, frequency of past experience, and temporal distance) of the events were compared between conditions. The assumption of normality was violated in the first four cases (*skews* for: duration = .37, positivity = -.89, importance = -.64, frequency of past experience = -.01). Levene's Test of Equality of Error Variances was not significant in these cases ( $p > .37$ ).

Between conditions there was no significant difference in the duration of the focal event (control condition:  $M = 3.06$ ,  $SD = 1.26$  vs. diary condition:  $M = 3.0$ ,  $SD = 1.2$  vs. similar past condition:  $M = 3.03$ ,  $SD = 1.24$ ),  $F(2, 102) = .18$ ,  $p = .98$ , *ns*. There was no significant difference in the extent to which participants perceived their focal event as positive (control condition:  $M = 9.39$ ,  $SD = 1.31$  vs. diary condition:  $M = 9.22$ ,  $SD = 1.27$  vs. similar past condition:  $M = 9.64$ ,  $SD = 1.45$ ),  $F(2, 102) = .82$ ,  $p = .44$ , *ns*. Participants in all three conditions nominated events which they found moderately important (control condition:  $M = 8.47$ ,  $SD = 2.32$  vs. diary condition:  $M = 8.39$ ,  $SD = 1.99$  vs. similar past condition:  $M = 8.82$ ,  $SD = 1.79$ ),  $F(2, 102) = .42$ ,  $p = .66$ , *ns*. There was no significant difference in the frequency participants have experienced events similar to the focal event in the past (control condition:  $M = 6.03$ ,  $SD = 2.60$  vs. diary condition:  $M = 6.19$ ,  $SD = 2.57$  vs. similar past condition:  $M = 7.30$ ,  $SD = 2.80$ ),  $F(2, 102) = 2.31$ ,  $p = .10$ , *ns*. Temporal distance of the focal event did not differ significantly across conditions,  $\chi^2(4, N = 105) = 3.5$ ,  $p = .48$ , *ns*, indicating that across groups the events took place at similar points in time.

Across groups, participants nominated focal events with similar characteristics.

### 3.1.3. Manipulation Check

A manipulation check was conducted to ensure participants reported a focal event which matched the requirements (positive and likely to occur). Two participants were excluded for choosing a negative event (*positivity* < 7, out of 11), four participants were excluded for choosing an event that was unlikely to occur (*Likelihood to occur* < 7, out of 11). After excluding these six cases, the pattern of data stayed very similar. Further analysis was conducted without these data. The remaining sample consisted of 99 participants.

### 3.1.4. Normality

The data for predicted and experienced happiness ratings were negatively skewed (*skews*: -.77 and -.94, respectively). This reflects that people are generally happy (Meyers & Diner, 1995; Diener & Diener, 1996). One assumption of ANOVAs is that data must be normally distributed. However, ANOVAs tend to be robust against a violation of this assumption (Roberts & Russo, 1999). Therefore, following earlier research in this area, ANOVAs were used for further analysis (Buehler & McFarland, 2001; Wilson et al., 2000; Gilbert et al., 1998).

### 3.1.5. Homogeneity of Variance

For all ANOVAs used here, the Levene's test for homogeneity of variance was not significant ( $p > .05$ ). Therefore, the assumption of equality of variance was satisfied.

## 3.2. Main hypotheses

### 3.2.1. Predicted and Experienced happiness

The first hypothesis was to replicate the impact bias. A one-way within ANOVA indicated that participants predicted significantly greater happiness ( $M = 8.35$ ,  $SD = 1.79$ ) than they actually experienced ( $M = 7.46$ ,  $SD = 2.35$ ),  $F(1, 98) = 16.46$ ,  $p < .001$ ,  $\eta_p^2 = .14$ . The effect size suggests a medium to large effect (Cohen, 1988). Therefore, the first hypothesis was supported.

### 3.2.2. Focalism

The second hypothesis stated that focalism ratings and happiness predictions correlate.

The two items that measured focalism (focus on focal event and focus on unrelated events) were negatively correlated,  $r(97) = -.56$ ,  $p < .001$ , two tailed, indicating that those people who reported that they had focused strongly on the focal event, also reported that they have focused less on other events. To compute an index of focalism, the item "focus on unrelated events" was reverse-coded and then both items were averaged. This way, greater numbers on the focalism measure indicate great focus on the focal event and little focus on unrelated event.

Focalism and happiness predictions correlated strongly,  $r(97) = .39$ ,  $p < .001$ , two-tailed. People who focused more on the focal event also made more extreme happiness predictions. Therefore, the second hypothesis was supported.

### 3.2.3. Defocusing conditions

The third hypothesis stated that the impact bias was more pronounced in the control than in the experimental conditions, and that this effect was mediated by focalism. It was predicted that the impact bias was more pronounced because of more optimistic happiness predictions in the control condition than in the experimental conditions.

To test this hypothesis, a 2 (measure: predicted vs. experienced happiness) x 3 (condition: control vs. diary vs. similar-past) mixed factorial Analysis of Variance (ANOVA) was conducted, with measure as the within factor. A significant main effect of measure again indicated that participants predicted greater happiness ( $M = 8.35$ ,  $SD = 1.79$ ) than they actually experienced ( $M = 7.46$ ,  $SD = 2.35$ ),  $F(1, 96) = 18.27$ ,  $p < .001$ ,  $\eta_p^2 = .16$ . There was no significant main effect for condition,  $F(2, 96) = 2.19$ ,  $p = .12$ , *ns*, indicating that, collapsing across measures, happiness was similar across conditions (control condition:  $M = 7.73$ ,  $SD = 1.54$  vs. diary condition:  $M = 8.41$ ,  $SD = 1.69$  vs. similar past condition:  $M = 7.55$ ,  $SD = 2.07$ ).

Of greater theoretical interests was a significant interaction between measure and condition,  $F(1, 96) = 3.16$ ,  $p = .047$ ,  $\eta_p^2 = .06$ , reflecting that the impact bias differed across conditions (Table 1). The effect size indicates a small to medium effect. Visual inspection suggests that the impact bias was least pronounced in the diary condition, slightly larger in the control condition and largest in the similar-past condition (Figure 2).

**Table 1.** Mean and Standard Deviation of predicted, experienced happiness, and focalism; presented separately for each condition.

	Control	Diary	Similar past	Total
Measure	Mean (SD) n = 35	Mean (SD) n = 34	Mean (SD) n = 30	Mean (SD) n = 99
Predicted Happiness	8.14 (1.77)	8.56 (1.78)	8.37 (1.87)	8.35 (1.79)
Experienced Happiness	7.31 (2.07)	8.26 (1.99)	6.73 (2.79)	7.46 (2.35)
Focalism	6.44 (2.30)	6.59 (2.27)	6.78 (2.63)	6.6 (2.37)

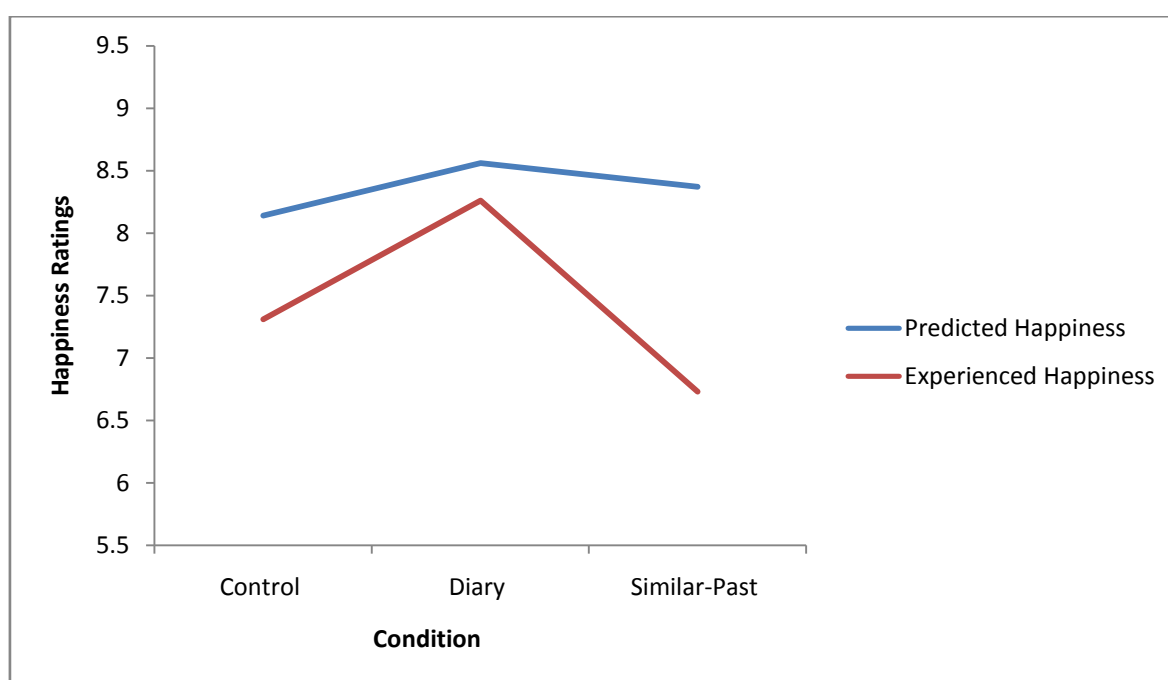


Figure 3. Predicted and Experienced happiness across conditions.

Visual inspection further suggests that, contrary to the third hypothesis, predicted happiness was equal across groups, whereas experienced happiness differed. Supporting this observation, a one-way ANOVA revealed no significant main effect for condition on predicted happiness,  $F(2, 96) = .46, p = .63, ns$ , suggesting that predicted happiness did not differ across conditions. In contrast, a one-way ANOVA revealed a significant main effect of conditions on experienced happiness,  $F(2, 96) = 3.69, p = .03, \eta_p^2 = .07$ . The effect size indicates a medium effect. A Bonferroni post-hoc analysis on experienced happiness found a significant difference between the diary condition ( $M = 8.26, SD = 1.99$ ) and the similar-past condition ( $M = 6.73, SD = 2.79$ ) ( $p = .026$ ). This suggests that the significant interaction reported above, is due to people in the similar-past condition reporting lower experienced happiness than people in the diary condition. Contrary to the second hypothesis, conditions differed in experienced, but not in predicted happiness (see Figure 2).

There was no significant effect of condition on predicted happiness (see

above) and no main effect of condition on focalism,  $F(2, 96) = .16$   $p = .85$ , *ns*, indicating that focalism ratings did not differ across conditions (control condition:  $M = 6.44$ ,  $SD = 2.30$  vs. diary condition:  $M = 6.59$ ,  $SD = 2.27$  vs. similar past condition:  $M = 6.78$ ,  $SD = 2.63$ ). Therefore, the mediation analysis was not conducted as planned.

In summary, the third hypothesis was not supported by the data. Neither happiness predictions nor focalism differed significantly between conditions.

### 3.2.4. Temporal Distance

#### 3.2.4.1. Near vs. Distant Future Events

The fourth and final hypothesis stated that people exhibited a greater impact bias for events which were going to happen in the distant future compared to events which were going to happen in the near future. Again, it was predicted that this was mediated by focalism ratings.

To test the third hypothesis, people were grouped into two categories. Those people who, in retrospect, reported that their focal event took place 6-7 days ago were grouped into the “near-future” category (i.e., the focal event took place within two days after the day of prediction). Participants who indicated that their focal event took place 0-3, or 4-5 days ago were grouped into the category “distant-future” (i.e. the focal event took place more than two days after prediction; see Table 2). A large body of research has shown that effects of time are greater, the nearer they are to the present (e.g. Kassam et al., 2007). Considering the small sample size, it therefore seemed reasonable to group participants into these two categories.

A 2 (measure: predicted vs. experienced happiness) x 2 (temporal distance: near vs. distant future event) mixed factorial ANOVA was conducted, with measure as the within-subjects factor. A main effect of measure  $F(1, 97) = 12.17$ ,  $p = .001$ ,  $\eta_p^2 = .06$ , indicated that the impact bias was again observed. There was no significant main effect for temporal distance,  $F(1, 97) = .72$ ,  $p = .43$ , *ns*. Collapsing across measures, people made similar happiness ratings.

Of greater theoretical interest was the significant measure by temporal distance interaction,  $F(1, 97) = 4.19$ ,  $p = .043$ ,  $\eta_p^2 = .041$ . The effect size indicates that this effect was small to medium. Follow-up analysis confirmed that the two groups differed between predicted happiness (near-future:  $M = 7.7$ ,  $SD = 1.55$  vs. distant-future:  $M = 8.55$ ,  $SD = 1.82$ ),  $t(97) = -2.02$ ,  $p = .044$ , whereas they did not differ significantly in experienced happiness (near-future:  $M = 7.61$ ,  $SD = 2.44$  vs. distant-future:  $M = 7.42$ ,  $SD = 2.33$ ),  $t(97) = .334$ ,  $p = .739$ , *ns*.

**Table 2.** Descriptive statistics for predicted and experienced happiness and focalism by temporal distance. Note: Temporal distance ratings were taken in retrospect, larger numbers reflect that the event took place close to time of predictions.

	Near-future events (6-7 days ago)	Distant-future events (0-5 days ago)	Total
Measure	Mean (SD) <i>n</i> = 23	Mean (SD) <i>n</i> = 76	Mean (SD) <i>N</i> = 99
Predicted Happiness	7,7 (1,55)	8,55 (1,82)	8.35 (1.79)
Experienced Happiness	7.61 (2.44)	7.42 (2.33)	7.46 (2.35)
Focalism	6.28 (2.18)	6.69 (2.43)	6.6 (2.37)



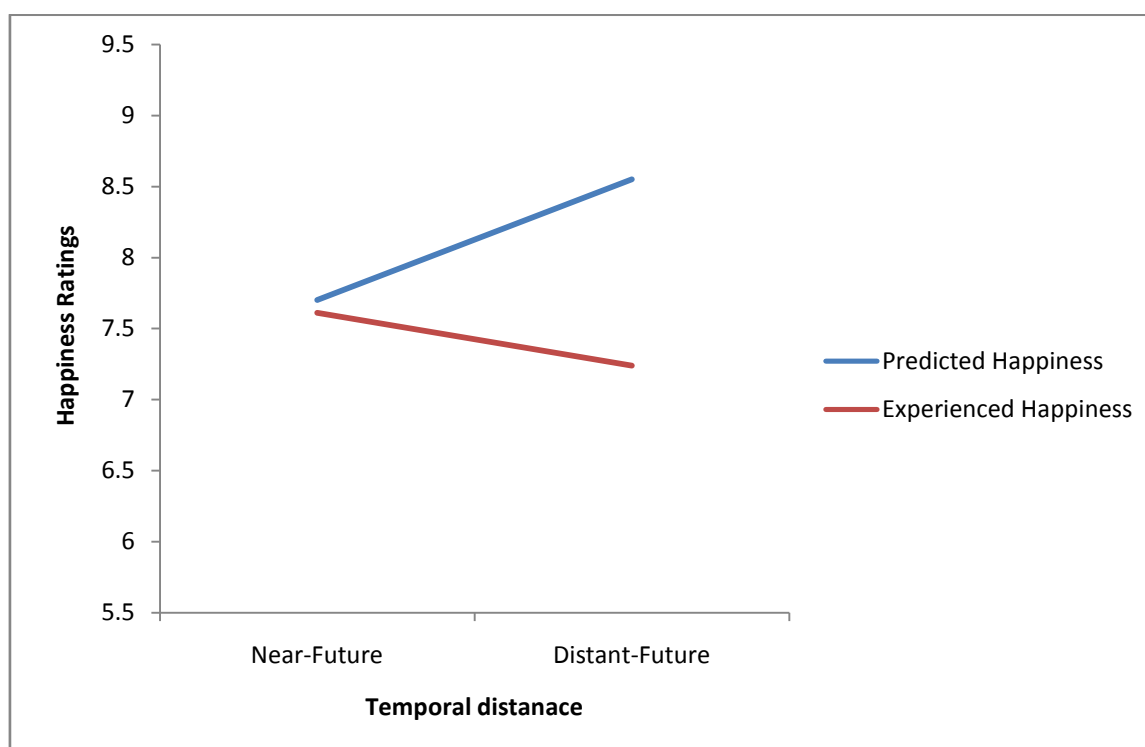


Figure 4. Predicted and experienced happiness, for near and distant future events.

Visual inspection (see Figure 4) shows, that people who had chosen a near-future event were quite accurate in predicting their happiness, whereas participants who had chosen a distant-future focal event overestimated their happiness. A within ANOVA on measure (predicted vs. experienced happiness) which used only participants who had selected a near-future event, showed that these people did not significantly overestimate their happiness,  $F(1, 22) = .09, p = .86, ns$ . A within ANOVA on measure (predicted vs. experienced happiness) which only used people who selected a distant-future event, showed that these people overestimated their happiness,  $F(1, 75) = 22.34, p < .001, \eta_p^2 = .23$ . This suggests that the impact bias was only found for those who selected a distant-future event. The effect size indicates that these people exhibited a large impact bias (see Table 2).

These results strongly suggest that temporal distance of the focal event and affective forecasts are related.

The hypothesis further stated that temporal distance of the focal event related to focalism ratings. The relationship was in the direction predicted, however, it did not reach significance level,  $t(97) = .721, p = .473, ns$ . People who had selected a distant-future event made tended to report slightly higher focalism ratings.

#### 3.2.4.2. Mediation analysis on temporal distance

The relationship of focalism and temporal distance was, although not significant, in the direction predicted. The insignificance of the relationship may have been related to an issue of power, due to the small sample size in people who nominated a near-future focal event. Acknowledging the fact that full mediation cannot be established because temporal distance had no significant effect on focalism, a mediation analysis was conducted nevertheless. The results of this mediation analysis are only

indicative.

Regression analyses were conducted to determine whether the difference in happiness predictions between temporal distance groups was mediated by the degree of focalism. Predicted happiness was first regressed on temporal distance and then on focalism ratings. The effect of temporal distance on predicted happiness,  $t(97) = 2.04$ ,  $p = .044$ , was attenuated after the ratings of focalism were entered,  $t(96) = 1.9$ ,  $p = .061$ , *ns*. This pattern suggests that the effect of temporal distance was mediated partially by the extent to which participants focused on the focal event (Figure 5). After controlling for focalism ratings, the effect of temporal distance on predicted happiness was not significant anymore ( $p > .05$ ). Nevertheless, the mediation effect failed to reach significance level ( $z = .71$ ,  $p = .24$ , by Sobel test on the unstandardized coefficients, one-tailed).

The effect of focalism remained significant when controlling for temporal distance,  $t(96) = 4.14$ ,  $p < .001$ , indicating that focalism is a strong predictor for happiness predictions, even when temporal distance is taken into account.

In summary, the fourth hypothesis was partially supported. Happiness predictions were more optimistic for distant-future events than for near-future events, however, this was not significantly mediated by focalism.

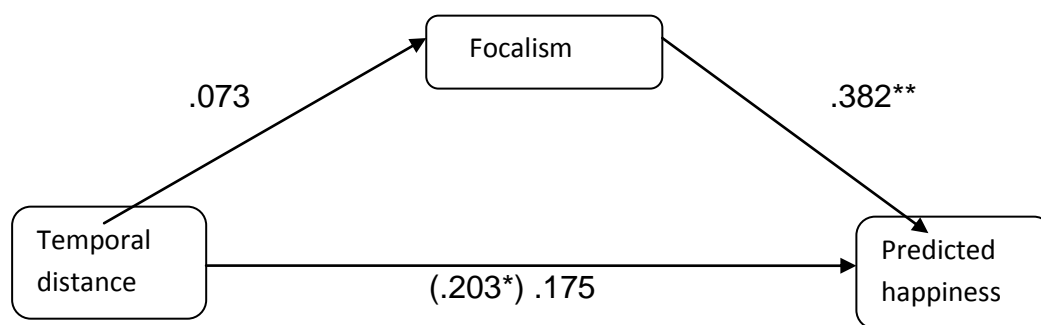


Figure 5. Mediation of the effect of temporal distance on predicted happiness by focalism ratings.

Path coefficients represent standardized Beta coefficients. The value in parentheses is the standardized beta coefficient for the relationship between temporal distance and predicted happiness without controlling for focalism.

\* $p < .05$ , \*\*  $p < .001$ .

#### 4. Discussion

Consistent with the first hypothesis, the impact bias was observed. Consistent with the second hypothesis, focalism and happiness predictions correlated. Contrary to the third hypothesis, the defocusing techniques did not moderate focalism and happiness predictions. Consistent with the fourth hypothesis, happiness predictions were more optimistic for distant-future events than for near-future events. Contrary to the fourth hypothesis, this difference in happiness predictions was not mediated by focalism.

In the following, each hypothesis will be discussed in separate sections. Each

section starts with a summary of the results, then findings are related to the previous literature and limitations are mentioned. Where appropriate, suggestions for further research are made, and alternative explanations are stated. Afterwards, general issues are discussed. The last section concludes.

#### **4.1. The impact bias**

Consistent with an expanding body of literature, the current study also found the impact bias (Buehler & McFarland, 2001; Mitchell, et al., 1997; Rachman & Arntz, 1991; Schkade & Kahneman, 1997; Wilson et al., 2000).

Note that the current study took experienced happiness ratings only at one point in time. Therefore, the design does not allow inferring whether the impact bias observed was due to overestimation of intensity or due to an overestimation of the duration of the emotional reactions. Studies which investigate intensity and duration, suggest that generally, people overestimate both (Wilson & Gilbert, 2003).

#### **4.2. Focalism measure**

The two-item measure of focalism correlated with happiness predictions. People who focused more on the focal event also predicted that this event will elicit greater emotional reactions. This is a replication of the findings by Lam et al. (2005).

The results are correlational in nature, therefore they do not allow inferring causation. However, Wilson et al. (2000) and Lam et al. (2005) have shown that manipulating focalism leads to a change in the impact bias, indicating a causal link between the two.

The measure of focalism is limited in two main aspects: Firstly, the measure relies on self-report. It is possible that participants' insight into how much they focus on events is limited. Secondly, it has been suggested that underappreciation of adaptation is a part of the focalism construct (Ubel et al., 2005). The measure used here does not incorporate an item to assess this part of focalism. Future research could focus on further validating a measure of focalism.

#### **4.3. Defocusing exercises**

##### *4.3.1 Diary condition*

Contrary to predictions, the diary exercise did not moderate focalism, and it also did not moderate happiness predictions.

The results were unexpected, as the current study used a methodology very similar to the study by Lam et al. (2005), which found a moderating effect for the diary manipulation. There are some differences between the current study and the Lam et al. (2005) study, which may have led to the different results.

The current study had a filler task in the control condition, whereas in Lam et al.'s (2005) study, participants in the control condition did not engage in any other filler task. This may have affected the forecasts from the control condition, thereby affecting the comparison between conditions.

Secondly, the current study used a target day one week in the future, whereas Lam et al. (2005) chose a target day two weeks in the future (see section 4.4.).

Thirdly, in Wilson et al.'s (2000) and in Lam et al.'s (2005) studies, participants were asked to nominate one activity in which they were likely to be engaged in for every one hour of the day. In contrast, the current diary exercise asked participants to nominate one activity for every two hours. This broader approach to the diary manipulation may have taken away some of its power (see Ayton et al., 2007).

Future research could try to identify the factors which influence the effectiveness of diary exercises.

#### *4.3.2. Similar-past condition*

The similar-past exercise did not moderate focalism, nor happiness predictions.

Wilson, Meyers and Gilbert (2001) argue that learning from past experience depends on three requirements. Firstly, one has to make the effort to recall past experiences, secondly, one needs to recall appropriate experiences, thirdly, one needs to correctly recall the feelings associated with these events. The null results suggest that at least one of these requirements was not met. As all participants in this condition answered the questions about past experiences, it can be assumed that the first condition is reasonably satisfied. Participants were asked to recall the last two times they had experienced similar events, hoping that this decreased the risk of participants recalling the most extreme forecasts (Morewedge et al., 2005). Thus, it seems likely that participants have misremembered how these past experiences had made them feel. This is especially true as it has been shown that people often overestimate the intensity of past emotions (Levine et al., 2006; Wilson et al., 2003).

Unexpectedly, people in the similar-past condition reported lower experienced happiness than participants in the other conditions. These results were unexpected, and it can only be speculated about their source. One possibility is that these results are due to a coincidence and participants in the similar-past condition simply happened to be less happy. Another possibility is that the similar-past exercise reminded people of similar experiences, leading participants to perceive the focal event as less special. This speculation, however, would normally include that participants also predict less happiness, which was not the case.

From these findings, it seems that learning from the past really is a difficult endeavour, perhaps more difficult than often assumed (Dunn & Laham, 2006). Also, the results highlight that defocusing methods need to be tested in longitudinal study designs, in order to make sure that the defocusing exercises influence happiness predictions, and not experienced happiness.

#### *4.3.3. Defocusing and Focalism*

Note that the current findings are consistent with the idea that focalism influences the impact bias. The defocusing methods did not moderate focalism, nor happiness predictions. This indicates that the exercises failed to influence focalism, which therefore did not lead to moderation in happiness predictions.

### **4.4. Temporal distance**

As predicted, people made more extreme happiness predictions for events happening in the following 3-7 days than for events happening in the following 0-2 days. People did only exhibit the impact bias for distant future events. Contrary to predictions, this was not accompanied by a significant increase in focalism. Nevertheless, there was an insignificant tendency for focalism to be higher for distant-future events than for near-future events.

As predicted by temporal construal, distant future events were accompanied by more extreme happiness predictions (Trope & Liberman, 2003). The fact that focalism ratings did not differ, could be attributed to problems with the focalism measure. It is possible that the focalism measure used here was not exact enough to capture the differences between focalism in the two-temporal groups. The measure of focalism used here relied on self-report. However, it could be speculated that people's awareness of how strongly they have focused on the focal event is limited.

The variances in focalism induced by temporal distance may not have been reflected in the measures, because people are too familiar with construing distant-future events in a decontextualised fashion.

It could be interesting to follow-up these results, using another measure of focalism (see section 4.2). This is especially true as the current study was not designed for this hypothesis. Several weaknesses may have blurred the results; these include that only a small range of days were used, the temporal distance measure was taken in retrospect, and the sample size was very small.

The results leave space for potential other explanations. Distant-future events were closer to the target day than near-future events. An alternative explanation for the more positive happiness predictions for distant-future events is that people believe that these events, being closer to the target day, also influence their feelings on the target day to a greater extent.

Furthermore, it must be kept in mind that the data here are correlational. It is possible that distant-future events differed systematically from near-future events, or that a third variable has influenced both, for example, it is possible that emotional intelligence influenced both: The choice of an event and happiness predictions (Dunn, Bracket, Ashton-James, Schneiderman, Salovey, 2007).

Future research could aim to disambiguate the different explanations that may have contributed to the results, perhaps starting with a more sophisticated measure of focalism, and a design which would manipulate the temporal distance.

#### *4.4.1. Other relevant literature*

##### 4.4.1.1. Temporal distance and future optimism

The current findings relate to future optimism (Taylor & Brown, 1988; Sanna & Schwarz, 2004). People expect more positive outcomes for distant-future events than for near-future events (Mitchell et al., 1997; Shepperd, Ouellette, Fernandez, 1996). For example, people expected to do better on an aptitude test when this test was announced to take place in four weeks, than when the test was announced to take place immediately (Nisan, 1972). If people generally are more optimistic about the unfolding of the distant-future events, this may have contributed to the findings.

##### 4.4.1.2. Planning fallacy

People underestimate the time it will take to complete any given task (Lovallo & Kahneman, 2003; Buehler, Griffin, Ross, 2002). For example, students tend to underestimate how much time they will need to finish their dissertation (Buehler, Griffin, Ross, 1994). This phenomenon is partly due to people neglecting the incidental events which will take their time in the future, focusing exclusively on the amount of time they will spend on the task in question. Therefore, the planning fallacy has been linked to focalism (Buehler et al., 1994, Wilson et al., 2000).

Temporal distance also seems to play a role in the planning fallacy. When students who were working on group projects, were asked to consider “how much time” they had left until the deadline, they exhibited a stronger planning fallacy than when they were asked to consider “how little time” they had left. That is, when people subjectively perceived the deadline to be nearer, the planning fallacy was attenuated in comparison to people who perceived the deadline to be temporally distant (Sanna, Park, Chang, Carter, 2005).

##### 4.4.1.3. Temporal distance and future anhedonia

After outlining literature which is consistent with the current results, a new theory which is inconsistent with the findings also needs to be mentioned. According to

“future anhedonia”, people predict less intense feelings for distant-future events than for near-future events. Kassam et al. (2008) base the theory on the findings that participants predicted greater happiness for receiving a monetary gain in the near future (e.g. in one/seven days), than for receiving the same gain in the distant future (e.g. in 180/365 days).

The current research differs to the study by Kassam et al. (2008) in several aspect (i.e. the current study investigates the impact bias, whereas Kassam et al. investigate the intensity of reactions; the current study uses a considerably smaller time frame). Nevertheless, it is of relevance to future anhedonia, as it also investigates the role of temporal distance on affective forecasting. The results, although only correlational, suggest that temporal distance does not necessarily moderate, but can also intensify, affective forecasts. According to newer models on time-dependent changes of preference, temporal distance affects evaluation of events differently, depending on the characteristics of the event in question. This may be a potential approach to integrate the current findings with those by Kassam et al. (2008; Trope & Liberman, 2003; Frederick, Loewenstein, O’Donoghue, 2001).

#### **4. 5. General issues**

##### *4.5.1. Future Research*

Taking the two main findings from this study, it could be speculated that an effective method to decrease the impact bias might be to subjectively decrease temporal distance. This approach seems especially promising for several reasons. Firstly, the current study shows that the diary manipulation does not robustly decrease the impact bias (see 4.2.1.). Secondly, people have difficulties learning from past experiences (see 4.2.2.). Therefore, according to the current results, these two commonly pursued approaches seem less promising. Thirdly, people exhibit a decreased impact bias for near-future events (see 4.3.). Fourthly, the planning fallacy, which has also been linked to focalism, has been decreased using a similar approach (see 4.4.2.3.).

Future research could also investigate focalism, and how it changes with temporal distance, to a greater extent. This could have interesting implications for theories on affective forecasting, but also for other theories, to which focalism has been linked, such as the planning fallacy and temporal construal theory (Buehler & Griffin, 2003; Trope & Liberman, 2003)

##### *4.5.2. Motivational aspects of the impact bias*

After some potential methods of reducing the impact bias have been discussed, it needs to be mentioned that the impact bias may also bring advantages. If people knew how fast their emotional reactions decrease, they might not set themselves higher goals, but they might stop evolving (Rid, 2005).

This motivational aspect of the impact bias may also play a role in the finding that more distant future events are accompanied by a stronger impact bias. As people are more likely to be able to influence more distant future events, an increased impact bias for these events may increase their motivation to actually try to influence these events (Finkenauer, Galucci, Van Dijk, Pollmann, 2007) .

##### *4.5.3. Limitations*

Generally, the sample size was small, and the sample mainly consisted of students, which makes it not easy to generalise the result to other populations.

The study was online. Participants may have participated in very different

atmospheres, times and locations, which could have influenced their responses.

Not all participants answered the follow-up questionnaire. Only those who did were included in the sample, therefore there is some risk of pre-selection, i.e. it is possible that people who did not complete the follow-up differed systematically from those who did.

Those participants who have completed the follow up questionnaire have not all done so right after the receipt of the e-mail. The time span between predictions and follow-up measures differed between participants. This may have influenced the validity of the measure of temporal distance, which was taken in retrospect.

Participants could choose which focal event they nominated. Although event characteristics were assessed to some extent (see 3.1.2), it cannot be ruled out that systematic differences between focal events contributed to the results.

Lastly, this study uses a one-item self-report measure of happiness. It could be argued that self-reported happiness ratings are not reliable, or that one-item measures will not capture a person's true state. This is especially true as happiness ratings have been shown to differ depending on what information is currently salient, a person's cultural background, and a person's weighting of different moods and emotions (Diener, Lucas, Oishi, 2005). Also, a one-item measure is open to different interpretations. Whereas one person may interpret the question as asking about hedonic experiences only, other people may incorporate rewarding experiences and life-satisfaction (Wilson et al., 2000). These objections are important, however, it should be noted that self-reported well-being measures have been shown to correlate strongly with expert ratings, smiling, reports of family and friends and on-line happiness (Sandvik, Diener, Seidlitz, 1993). Also, many previous studies have used one-time measures. Despite all their shortcomings, results that used one-item measures could nevertheless often be replicated.

#### *4.5.4. Ethical issues*

One potential ethical issue is that some participants were acquainted with the experimenter. This may have affected the response behaviour of participants.

In the follow-up questionnaire, participants were explicitly reminded of the event they had nominated. If the event had turned out to be disappointing, this could have enhanced the feeling of disappointment and refreshed unpleasant memories.

#### **4.6. Summary and Concluding Comments**

In summary, the current results suggest that decreasing the impact bias by reminding people about other events which will take their attention, is not as robust as sometimes suggested. Also, reminding people about previous similar experiences does not seem to work as an effective defocusing method.

In the present study, people exhibited no impact bias for near-future events, but they did exhibit an impact bias for distant-future events. Focalism did not mediate the effects of temporal distance, suggesting that either the focalism measure was not exact enough, or an alternative explanation has contributed to the results. Temporal distance and focalism have been linked to several other theories and biases, suggesting that focalism and temporal distance play a role in other aspects of human cognition than affective forecasting.

It can be concluded that future research in this area may try to construct a robust defocusing method. Also, future research may aim to integrate findings related to focalism from different study areas, in order to determine how this cognitive mechanism may be involved in general human cognition.

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