Running head: SURROGATE EMOTIONS AND AFFECTIVE FORECASTS

My Imagination vs. Your Feelings: Can Personal Affective Forecasts Be Improved By Knowing Other Peoples' Emotions?

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Abstract

A proposed remedy for biased affective forecasts is to base judgments on the actual feelings of people (surrogates) currently experiencing the event, rather than using imagination which conjures an inaccurate vision of the future. Gilbert et al. (2009) forced people to use surrogate reports by withholding all event information, resulting in better predictions. However, in life surrogate information rarely supplants event information - can people effectively integrate both types of information into their judgments? In 5 studies, respondents predicted the impact of a health state on their own happiness. Respondents incorporated surrogate information into their judgments both in the presence and absence of event information. However, they inappropriately discounted other people's experiences as a valid predictor of their own - particularly in the presence of event information – and imagined their happiness would be different to surrogates' happiness. Excluding pre-existing event knowledge, changing the size of the surrogate sample, or increasing the size of the response scale, did not alter the adjustment. Although surrogate information improved affective forecasts, its influence was diminished by the presence of event information.

Key words: Affective forecasting, Surrogation, Impact bias, Health state

My Imagination vs. Your Feelings: Can Personal Affective Forecasts Be Improved By Knowing Other Peoples' Emotions?

The conclusion that people predict their future emotions inaccurately - by overestimating both the intensity and duration of their emotional response to an event - is clearly demonstrated in a range of empirical studies (Dunn, Wilson, & Gilbert, 2004; Gilbert, Driver-Linn, & Wilson, 2002; Ubel et al., 2001). This effect, known as the *impact bias*, has been shown for a wide-range of events, from mis-predicting the impact of winning a football match (Wilson, Wheatley, Meyers, Gilbert, & Axsom, 2000), to electoral defeat (Gilbert, Pinel, Wilson, Blumberg, & Wheatley, 1998), to failing a driving test (Ayton, Pott, & Elwakili, 2007). The impact bias has also been measured for more consequential events, such as the influence of chronic health states on well-being: people overestimate the impact of a variety of health states on both their own happiness as well as other peoples' happiness (Walsh & Ayton, 2009) despite there actually being little variation in the happiness of people living with or without chronic health states (Brickman, Coates, & Janoff-Bulman, 1978; Walsh & Ayton, 2009). This leads to a discrepancy between non-patients' predictions and patients' actual experiences (Hurst et al., 1994; Riis et al., 2005). A discrepancy between anticipated and experienced outcomes may lead to suboptimal decisions (Sevdalis & Harvey, 2007) which, in a medical context could have serious long-term consequences.

Why do we persistently make these errors in our affective forecasts? Several explanations suggest that we do not accurately *imagine* the future event. One proposal, known as the *focusing illusion*, suggests that people incorrectly focus on the target event and disregard other events which could also impact and moderate their future emotions, resulting in extreme forecasts

(Kahneman, Krueger, Schkade, Schwarz, & Stone, 2006; Schkade & Kahneman, 1998; Wilson et al., 2000). A further proposed error with the imagination process is that people fail to imagine that they would adapt to the future event, a process of *unforeseen adaptation* (Gilbert et al., 1998). They imagine their immediate affective reaction and fail to take into consideration that over time their reaction to the event would diminish and they would return to their baseline emotional state.

If we can not accurately imagine our reaction to a future event, how about recalling memories of our past experiences as a guide to predicting our future happiness? Studies have shown that not only can we not accurately remember how we felt (Wirtz, Kruger, Scallon, & Diener, 2003) but that we also tend to recall atypical instances of the event, thereby biasing our future predictions (Kahneman, Fredrickson, Schreiber, & Redelmeier, 1993; Morewedge, Gilbert, & Wilson, 2005).

It would therefore seem that our imaginations, and our memories, lead us down the garden path when it comes to anticipating our future emotions. Furthermore, endeavours to reduce the impact of these effects on predictions have produced mixed results. Ubel, Loewenstein, and Jepson (2005) compared different methods designed either to reduce the impact of the focusing illusion or of unforeseen adaptation. They found that exercises designed to reduce the focusing illusion had limited effect (a finding consistent with Baron et al., 2003; Ubel et al., 2001; and Walsh & Ayton, 2009). However, exercises which drew attention to the process of adaptation successfully reduced the bias, leading Ubel et al. (2005) to conclude that unforeseen adaptation was a more appropriate explanation for the impact bias shown for health states.

Another proposed remedy to overcome the failings in our imagination is to disregard imagination entirely and instead base judgments on the actual feelings of people currently experiencing the event - a process termed *surrogation* (Gilbert, 2006). When people are denied the information that imagination requires to make a future prediction, and are only given information about the feelings of others', they make more accurate forecasts. Gilbert, Killingsworth, Eyre, and Wilson (2009) demonstrated that women more accurately predicted their enjoyment of a speed-date when they were provided with the enjoyment ratings of another woman who had experienced that date (surrogate information), than when provided with profile information about the date (event information). This was despite 75% of respondents believing that receiving event information would lead them to more accurate forecasts than receiving surrogate information.

Similarly, Norwick, Gilbert, and Wilson (2006) recorded how a group of people felt after they had received a prize and then taken part in a tedious task. A second group was informed that they would also receive the prize and participate in the task, but half of the respondents were told what the prize was and the other half were given the reported feelings of a member of the first group. Respondents who only knew what the prize was did not accurately predict their future feelings; arguably because they had used their imaginations to envisage receiving the prize but had failed to anticipate how the tedious task would make them feel. In contrast, respondents who could only base their judgments on the reported feelings of a member of the previous group made accurate forecasts: although they had no information about the future event, by basing their judgments on the experiences of the surrogates they correctly anticipated their future feelings.

These findings suggest that for people to accurately predict their future happiness, they should not contemplate information about the future event – thereby disabling their imaginations

- and instead base their judgments on the feelings of others. Although a fitting suggestion in theory, it will, arguably, not often be feasible in practice. Outside of the laboratory, when making predictions about the impact of a future event, people rarely know how that event is making someone else feel without at the same time knowing something about the event itself. For example, we can read reports of how much critics enjoyed a movie but also know who stars in the film, or we can read reviews of hotels but see pictures of its location, making it difficult to separate event information and surrogate information when making our predictions. While it might be possible to withhold event information under some circumstances (e.g. one might not tell a child that their sandwich contained some ingredient they professed repugnance of) it is difficult to see how information could be practically and ethically withheld in more consequential cases. For example when contemplating the impact of a health state on happiness; it is highly doubtful that people could be told about the happiness of surrogates without some information about the health state also being disclosed. Even if all that people knew was the name of the health state, this might still be enough to enable their imaginations to bias their judgments. Gilbert et al. (2009, p.1619) conceded that "…people may be reluctant to engage in surrogation if they have the opportunity to do otherwise". For the surrogacy proposal to provide an effective panacea for the bias in judgments, an important issue is whether people incorporate surrogate information into their judgments when presented alongside event information, as well as when presented on its own.

A potential limitation of surrogate information as a guide to personal happiness is that its value may be downplayed because people believe they are different to others (Kruger, 1999). Most people believe themselves more likely than the average person to be a better driver or live past 70 years; and less likely than the average person to own an airplane or get lung cancer

(Kruger & Burrus, 2004; Svenson, 1981; Weinstein, 1980). Furthermore they think that life events would affect them in a different way to how they affect others: people predict that their own happiness would be more affected by a health state than other people's happiness would be (Walsh & Ayton, 2009). Gilbert (2006) proposed that when given the choice people would prefer to receive event information to surrogate information precisely because they believe they are different to the surrogates. Moreover, as reported above, Gilbert et al. (2009) found that most of their respondents believed that event information would be more useful than surrogate information. Therefore if presented with both types of information, it follows that people may discount the happiness of other people as a guide to their own happiness and use the event information to imagine how life would be different for them.

The aim of the following five studies was to explore whether people contemplating the impact of a health state incorporate information about others' happiness into their judgments. In particular, how do people respond when they are presented with *both* surrogate information *and* health state information? Do they realise the value of surrogate information or do they prefer to use their imaginations and base their judgments on the health state information? Does varying the degree to which surrogate information matches expectations affect the extent to which it is used? Is surrogate information used differently when predictions are being made for self-happiness, or the happiness of someone else? In all 5 studies, respondents were asked to imagine that they had just been diagnosed with a health state and to predict what their happiness would be after living with that health state for 1 year. It was predicted that respondents would fail to realise the value of other peoples' feelings and disregard the surrogate information, particularly when presented alongside health state information, in favour of their imaginations.

Study 1: Using Others' Happiness to Predict Self Happiness

The aim of this study was to explore the predicted impact on happiness of living with a chronic health state (kidney disease) for 1 year, after being presented with either surrogate information, health state information, or both surrogate information and health state information. The surrogate information presented was a happiness rating of 6.5 on a scale ranging from 1 (*not happy*) to 9 (*very happy*). This was the self-reported average happiness rating of a sample of 10 people living with kidney disease taken from Walsh and Ayton (2009). As non-patients overestimate the impact on happiness of living with a health state, we expected that this surrogate information would have seemed surprisingly high on the happiness scale to the respondents. Nonetheless it was predicted that respondents presented with only surrogate information would make more accurate predictions (i.e. closer to the surrogate value) than respondents presented with only health state information, or both surrogate information and health state information.

The accuracy of predictions was assessed indirectly because respondents did not actually experience the health state. Instead a cross-sectional design was used where respondents' predictions were compared with the experiences of others. This design has several advantages over a longitudinal design as it allows us to test the predicted impact of a rare event, such as a health state; it avoids any issues with re-interpretation of the scale which can occur once people have experienced an event; and it avoids any anchoring or priming on previous predictions (Loewenstein & Schkade, 1999). Therefore, in this study, the surrogate value has a special status because it is our best estimate of what the respondents' happiness would actually be if they were experiencing the health state we are asking them to consider. Gilbert et al.'s (2009) and Norwick et al.'s (2006) studies established that, for the cases they examined, surrogate reports were

indeed good predictors of their respondents' actual affective states. Of course, the logic of the surrogacy proposal for *generally* improving affective forecasts is that surrogate experiences are, in general, good predictors of other people's experiences. Accordingly our assumption is that we can use this surrogate value to benchmark the accuracy of affective forecasts.

Method

Design

There were 3 independent-samples conditions (only surrogate information, only health state information, surrogate and health state information). The dependent variable was happiness rating on a scale from 1 (*not happy*) to 9 (*very happy*). Respondents, randomly allocated to a condition, rated on the scale their current happiness, their predicted immediate happiness just after the described scenario, and their predicted happiness 1 year after the scenario.

Participants

639 respondents took part in the study, 73% of which were female. Age ranged from 18 to 58 years with a mean age of 21 years. Respondents were recruited via emails sent to UK university degree administrators (of varying subjects), who forwarded the invitation on to staff (n = 3) and students (n = 636). For completing the questionnaire, respondents were offered the opportunity to take part in a prize draw to win £20 of online store vouchers.

Procedure

Respondents completed the questionnaire over the Internet. They indicated their gender, age, and rated, "How happy would you say you are these days?" at the start or end of the

questionnaire, and then read one of the following scenarios (information in brackets was removed for respondents not receiving surrogate information):

Health state information [and surrogate information] scenario: [1]

Imagine you are being told by your doctor that you have developed kidney disease. In order to explain the likely impact of the condition, [the doctor tells you that a random sample of 10 people who have been living with kidney disease for at least 1 year report an average happiness of 6.5 on the 1-not happy to 9-very happy scale.] The doctor informs you that this is a condition in which there are abnormalities in your kidneys. This has resulted in kidney failure and you will need to be treated with dialysis, a process which typically involves you being connected via tubes to an artificial kidney machine to remove the waste products from your blood stream. You will need to receive dialysis either in a hospital for approximately 4 hours every 3 days a week, or at home for approximately 1 hour every day. You are informed that this treatment is not a cure and therefore dialysis will be required for your lifetime, or until you are eligible for a kidney transplant. Before the doctor can discuss this further a nurse comes into the room to ask a question about another patient.

Only surrogate information scenario:

Imagine you are being told by your doctor that you have developed a medical condition. In order to explain the likely impact of the condition, the doctor tells you that a random sample of 10 people who have been living with this condition for at least 1 year report an average happiness of 6.5 on the 1-not happy to 9-very happy scale. Before the doctor can discuss this further a nurse comes into the room to ask a question about another patient.

All respondents then predicted, “At that moment, how happy do you expect you would be?” (a filler question to assist respondents in differentiating between their immediate reaction to diagnosis and their more long-term reaction), and “How happy do you expect you would be 1 year after living with this condition?” (the target question). Finally all respondents indicated whether they or someone close to them was living with kidney disease.

Results

Forty-eight respondents indicated that they or someone close to them was living with kidney disease and therefore their data were excluded from the analyses, leaving complete data for 591 respondents. Analyses revealed that rating current happiness before or after reading the scenario did not significantly affect respondents’ predictions; therefore data are collapsed across this variable. In all of the studies, correlations between age of the respondent and predicted happiness were examined for age-related differences but no significant relationship was found. All of the subsequent effect sizes are based on Cohen (1988) and assume a small effect = .10, medium effect = .30, and a large effect = .50.

Did respondents predict that their happiness 1 year after living with Kidney Disease would be different from their current happiness? A 2 (happiness: current, predicted) x 3 (condition: only surrogate information, only health state information, surrogate and health state information) mixed ANOVA revealed that respondents predicted a significant decrease in their happiness 1 year after living with kidney disease, $F(1, 588) = 652.55$, $p < 0.01$, $r = 0.73$ (see figure 1). There was also a significant interaction, $F(2, 588) = 33.80$, $p < 0.01$; although respondents’ current happiness ratings did not differ across the 3 conditions, $F(2, 588) = 0.43$, $p = 0.65$, there were significant differences in respondents’ predictions, $F(2, 588) = 53.06$, $p < 0.01$, $r = 0.30$ (see table 1). Tukey post-hoc tests revealed that respondents presented with

surrogate and health state information made significantly higher (more happy) predictions than those presented with only health state information ($p < 0.01$). Furthermore, respondents who received only surrogate information made significantly higher predictions than those with surrogate and health state information ($p < 0.01$), and those presented with only health state information ($p < 0.01$).

Despite the judgments of respondents who received only surrogate information being the happiest, were their predictions as to their future happiness similar to the surrogate rating of 6.5 that they were given? A one-sample t-test compared their predictions with the surrogate rating of 6.5 and revealed that there was a significant difference between how happy they predicted they would be and the reported happiness of the surrogates, $t(122) = -6.87$, $p < 0.01$, $r = 0.53$. Respondents presented with only surrogate information predicted that they would be significantly less happy 1 year after living with kidney disease than the surrogates reported.

Discussion

Surrogate information improved affective forecasts both in the presence and absence of health state information. Respondents presented with only surrogate information integrated it into their judgments to make significantly more accurate predictions (i.e. predictions closer to the surrogate value) than those given only health state information, replicating previous findings (Gilbert et al., 2009). In fact, they made significantly more accurate predictions than respondents presented with any health state information. When presented with surrogate and health state information, respondents used both types of information to make their predictions. We can infer this because they made significantly more accurate predictions than respondents presented with only health state information and they made significantly less accurate predictions than respondents presented with only surrogate information.

However people did not make as accurate predictions as they could have done because they discounted the surrogate information somewhat, even when it was the only information presented. Moreover they discounted surrogate information more in the presence of health state information - people used their imaginations to moderate predictions of their future happiness rather than realising the value of other peoples' feelings – highlighting a problem in situations where event information can not be easily withheld. However, we should reiterate that our assessments of the accuracy of respondents' predictions were assessed indirectly: since respondents could not be "given" the health state it was not possible to compare their predictions with their own experiences. Nonetheless, as the surrogate value was the actual happiness of people living with kidney disease, and we have no grounds to believe that our respondents would experience this condition any differently to the surrogate sample, we have used it as a benchmark to estimate what our respondents' happiness would actually be.

Why did respondents discount the surrogate value? Given that respondents' average self-rated current happiness was 6.8, it may well be that the surrogate value of 6.5 was judged implausibly high. If respondents were sceptical that people with kidney disease could be almost as happy as themselves, this may have dissuaded them from using the surrogate rating. Even respondents who believed that other people with kidney disease were as happy as 6.5 might judge that they themselves would not be so happy – in effect treating themselves as a special case. In any event, if presented with a lower surrogate value, respondents might be expected to discount it less.

Study 2 – Using Surrogates' Happiness to Predict Self/Other Happiness

This study had two main aims: The first was to see how respondents respond when presented with a lower surrogate value. As people tend to overestimate the impact of health

states on happiness, a much lower surrogate happiness value would have been more consistent with their subjective opinion, and therefore we expect respondents would have less reason to discount this value. Accordingly, we presented respondents with the surrogate value of 2.5 on the 1-9 scale. This value is lower than the predictions of respondents who received only health state information in study 1, and therefore we would expect respondents who received this surrogate value to make lower predictions than those who received only health state information. Secondly, as there is evidence that people evaluate the impact of health states on their own happiness differently to that of other people's happiness (Baron, et al., 2003; Walsh & Ayton, 2009), the second aim was to examine whether surrogate information influenced predictions differently depending on whether respondents were predicting their own happiness or the happiness of others. While people might discount surrogate information because they believe it doesn't apply to them for some idiosyncratic reason, they might have less reason to discount it when considering the impact of health states for others.

Method

Design

There were 3 independent-samples conditions (only surrogate information, only health state information, surrogate and health state information) and all respondents made predictions from 2 viewpoints (self, other), except for the only health state information condition where only judgments for others' happiness were collected. The dependent variable was as per study 1.

Participants

Respondents were recruited and incentivised via the same methods as study 1 from Australian and UK universities (respondents were not recruited from the same universities who

had been contacted previously). 265 respondents took part in the study (11 staff and 254 students), 84% of which were female. Age ranged from 18 to 60 years with a mean of 24 years.

Procedure

The procedure was the same as Study 1 except that before being presented with the scenario, respondents were told to imagine that either themselves or someone close to them was experiencing the event (this order was counterbalanced for respondents predicting both viewpoints), and to indicate from a list the person they were imagining e.g. partner. This information was then automatically inserted into the scenario to facilitate considering the scenario from someone else's viewpoint, e.g. "imagine your partner is being told by their doctor…". Once they had made their predictions the scenario was presented from the alternate viewpoint.

Results

11 respondents indicated that they or someone close to them was living with kidney disease and therefore their data were excluded from the analyses, leaving complete data for 254 respondents.

An independent-samples t-test comparing self-happiness predictions by respondents who received only surrogate information or surrogate and health state information, revealed no significant difference, $t(150) = 0.54$, $p = 0.59$ (see table 2). However, when the self-happiness predictions of respondents who received only health state information in study 1 were included in this analysis as a third condition, there was a significant difference, $F(2, 387) = 4.54$, $p = 0.01$, $r = 0.15$. Respondents in study 1 who received only health state information made happier

predictions (see table 1) than respondents in study 2 who received only surrogate information ($p = 0.05$) or surrogate and health state information ($p = 0.05$) (see table 2).

Given that in this study the surrogate information was fabricated, we cannot use it in the same way as we used the surrogate value in study 1 to benchmark accuracy. Nevertheless, the same procedure used in study 1 to determine the accuracy of predictions can also be used in this study to determine the degree to which respondents incorporated surrogate information into their judgments when it was the only information they were presented with. The predictions of respondents presented with only surrogate information were compared to the surrogate value of 2.5. In contrast to respondents in study 1 who received only surrogate information of 6.5 and predicted they would be less happy, respondents in study 2 presented with only surrogate information of 2.5 predicted that they would be significantly *happier* than the surrogate value 1 year after living with kidney disease, $t(46) = 3.40$, $p < 0.01$, $r = 0.45$.

Did respondents make different predictions about their own happiness versus the happiness of someone close to them? Analysis exploring the self/other predictions of respondents who received only surrogate information or surrogate and health state information revealed no significant main effects or interactions[2]. In contrast, for those who received only health state information, an independent samples t-test revealed a significant difference between study 1 respondents who predicted for self and study 2 respondents who predicted for other; predictions for other's happiness were significantly lower than predictions for self happiness, $t(338) = 3.69$, $p < 0.01$, $r = 0.20$.

Discussion

The results of study 2 confirm that people do incorporate surrogate information into their thinking when making their predictions. Respondents who received surrogate information of 2.5

either on its own or alongside health state information made significantly lower predictions than respondents who received only health state information.

Nonetheless some discounting of surrogate information still occurred even when it was the only information respondents received. Study 1 respondents who received only surrogate information of 6.5 predicted they would be less happy than the surrogates, whereas study 2 respondents who received only surrogate information of 2.5 predicted that they would be happier than the surrogates, indicating that surrogate information was not the only consideration that respondents were basing their judgments on. The change in prediction direction depending on the surrogate value may be due to scale effects: noise in respondents' judgments could result in truncation of responses producing positive bias for lower scale points and a negative bias for higher scale points (cf. Juslin, Olsson, & Björkman, 1997). Conceivably it could also reflect a tendency for people to think they would cope better with events that have a large impact on other people (when surrogates report happiness of 2.5) and worse for events that have a minimal impact on other people (when surrogates report happiness of 6.5). If so however the direction of these predictions is somewhat surprising when compared with other findings (Kruger, 1999; Walsh & Ayton, 2009) showing that people tend to think they would do better than others on easy tasks and chronic health states they have adapted to, but worse than others on difficult tasks and chronic health states they have not actually experienced. The present finding can be distinguished from these other reports however as respondents here were presented with surrogate values rather than being asked to imagine them.

No distinction was observed in how respondents reacted to surrogate information when they judged the impact of kidney disease on themselves or on another. These results are somewhat surprising if one expects that respondents would be more likely to consider

themselves a special case – different to surrogates - than others. However this may have occurred because we asked respondents to rate the impact of kidney disease not simply on a random other but on someone close to them. This might have resulted in them judging the person close to themselves to also be a special case and could have induced a more empathic judgment.

Studies 1 and 2 show that respondents incorporated surrogate information with health state information to make higher or lower predictions (depending on the surrogate value) than in the absence of surrogate information. However, even in the absence of health state information (other than the fact it was a health state), people discounted surrogate information and used their imaginations to predict their future happiness instead of substituting the value indicating peoples' feelings. Respondents' discounting of surrogate information in the presence of health state information could be due to health state information presented in the experiment but could also be because of pre-existing knowledge they had about the health state. Aside from the presented information, it is plausible that respondents had some knowledge and even vivid misconceptions of kidney disease which they might perceive as conflicting with the surrogate value, and accordingly convince them that the surrogate values were not a good guide to their own happiness. The purpose of study 3 was to control for pre-existing knowledge about the health state by using a health state that respondents could not know anything about.

Study 3: Removing the Influence of Pre-existing Health State Knowledge

The aim of this experiment was to investigate whether respondents would discount surrogate information less and incorporate it more into their judgments when predicting the impact of a health state for which they had no pre-existing knowledge. Accordingly we invented an imaginary health state - piciloma. As respondents would only be able to base their judgments on presented information, any influence of health state information on forecasts would be

attributable to the information provided and not any preconceptions they brought to the experiment. In this study respondents were presented with one of 3 surrogate values – 3, 5 or 7 on a 1-9 scale of happiness - to explore the extent to which this influenced their use of this information.

Method

Design

This study had 3 independent-samples conditions (only surrogate information, only health state information, surrogate and health state information). Respondents presented with surrogate information received a surrogate value of 3, 5, or 7. The dependent variable was the same as in previous studies.

Participants

Respondents were recruited and incentivised as per study 1, except that occupation information was not collected (respondents were not recruited from the same universities who had been contacted previously). 489 respondents took part in the study, 71% of which were female. Age ranged from 18 to 60 years with a mean age of 21 years.

Procedure

The procedure was as for previous studies except that respondents completed a paper version of the questionnaire and predicted the impact of piciloma (a fictitious health state but respondents were unaware of this) and were told:

> Imagine you are being told by your doctor that you have developed piciloma. In order to explain the likely impact of the condition, [the doctor tells you that a random sample of

10 people who have been living with this condition for at least 1 year report an average happiness of X on the 1-not happy to 9-very happy scale]. The doctor informs you that this is a medical condition which is caused by a virus. From time-to-time you will experience headaches, shivers, feeling cold, and will generally feel unwell. Treatment is with a tablet which you will need to take every time you experience these symptoms, but there is no cure for this condition. Before the doctor can discuss this further a nurse comes into the room to ask a question about another patient.

Results

A 3 (surrogate information: 3, 5, 7) x 2 (health state information: yes, no) independent-samples ANOVA revealed a significant main effect of surrogate information, $F(2, 415) = 20.90$, $p < 0.01$, $\omega = 0.29$; predicted happiness increased as the surrogate value increased (see table 3). There was no main effect of health state information, $F(1, 415) = 0.69$, $p = 0.41$, but there was a significant interaction, $F(2, 415) = 3.17$, $p = 0.04$, $\omega = 0.10$ (see figure 2) indicating that the variance in surrogate values influenced respondents with health state information less than those with no health state information. One-way ANOVAs indicated that varying surrogate information influenced respondents who received health state information, $F(2, 215) = 3.43$, $p = 0.03$, $\omega = 0.15$, and respondents who did not receive health state information, $F(2, 200) = 23.59$, $p < 0.01$, $\omega = 0.43$.

Three one-sample t-tests compared the degree to which respondents incorporated surrogate information into their predictions when it was the only information they received. Our analyses showed, as in studies 1 and 2, positive bias for lower surrogate values and negative bias for higher surrogate values; respondents who received surrogate information of 3 made predictions for their own happiness that were significantly happier than the reported happiness of

the surrogates, $t(73) = 4.76$, $p < 0.01$, $r = 0.49$; respondents who received surrogate information of 7 made predictions for their own happiness that were significantly less happy than the reported happiness of the surrogates, $t(73) = -6.13$, $p < 0.01$, $r = 0.58$, and respondents who received surrogate information of 5 predicted no significant difference, $t(54) = -0.94$, $p = 0.35$.

Discussion

Predicted happiness increased as the surrogate value increased, indicating that respondents were using the surrogate information when predicting their future happiness. However respondents' forecasts were discrepant from the surrogate values indicating they thought they were different to others – even in the case where they had no information other than the surrogate values.

The influence of surrogate values on predictions was reduced when health state information was presented alongside surrogate information: respondents discounted the surrogate value more in the presence of health state information than its absence. This was despite the fact that, due to the fictitious nature of the health state, they were only able to base their predictions on the information provided; excluding pre-existing health state knowledge still resulted in a discounting of surrogate information. Surrogate information was incorporated into affective forecasts but the extent to which it was used was reduced in the presence of other knowledge about the health state; this reduction cannot be attributed to the influence of any pre-existing knowledge of the event.

One reason why discounting of surrogate information occurred could be because respondents were sensitive to the distribution of scores of a population. Respondents may have discounted the mean happiness of ten surrogates because they considered it a small sample which could represent an extreme view within the distribution of people with that health condition. If

so, increasing the surrogate sample size should lead to reduced discounting of the surrogate information.

Study 4: Increasing the Surrogate Sample Size

The aim of study 4 was to examine whether respondents were sensitive to the sample size of the surrogates by increasing the group size of the surrogates from 10 to 1000. Would respondents' discount surrogate information less when the size of the surrogate group was increased? The three independent-samples "only surrogate information" conditions from study 3 were rerun but this time the group size of the surrogates was changed to 1000.

Method

Participants

Respondents were recruited and incentivised as per previous studies (respondents were not recruited from the same universities who had been contacted previously). 261 respondents took part (3 staff and 258 students), 56% of which were female. Ages ranged from 18 to 46 years with a mean age of 21 years.

Results

Results from this study were compared to the only surrogate information conditions from study 3 (see table 3). A 2 (condition: surrogate 10, surrogate 1000) x 2 (surrogate information: 3, 5, 7) independent samples ANOVA revealed no main effect of condition, $F(1, 458) = 1.14$, $p = 0.29$, a significant main effect of surrogate information, $F(2, 458) = 59.10$, $p < 0.01$, $\omega = 0.66$, and no interaction $F(2, 458) = 0.19$, $p = 0.83$.

Discussion

Substantially increasing the size of the surrogate sample had no effect on the extent to which respondents incorporated the information into their predictions; discounting of surrogate values occurred to the same degree. Furthermore, examination of the percentages in table 3 reveals little change in the percentage of happiness ratings which were less than, equal to, or greater than the surrogate rating when the size of the surrogate sample was increased. This suggests that respondents were not disregarding the surrogate information because they were sensitive to the size of the surrogate sample.

An alternative candidate explanation as to why respondents discounted surrogate information, making forecasts that were higher than low surrogate values but lower than high surrogate values, is because of the proximity of the surrogate information to the endpoints of the scale. If we assume that respondents' judgments consist of a true score plus random error (cf. Thurstone, 1927) this could result in bias in responses when mapped onto a finite scale with endpoints; thus, error variance around judgments near the ends of the scale would be more constrained by the nearest endpoint in one direction but could vary more freely in the other direction. For cases where the added random error produced responses exceeding the scale values, truncation to the end points of the scale would result in positive bias for lower scale values and negative bias for higher scale values (cf. Juslin et al., 1997). Accordingly, the observed discounting of surrogate values could conceivably be due to noise in judgment rather than any underlying bias in judgment. To address this possibility we replicated study 4 using a scale which allowed more responses beyond the high and low surrogate values.

Study 5: Extending the Happiness Scale

The aim of this study was to explore whether respondents' tendency to discount surrogate values was due to constraints of the response scale. In this study the happiness response scale was increased to a 1-21 scale with the same endpoints of 1 (*not happy)* to 21 (*very happy*). The three independent samples conditions from study 4 were rerun but this time the surrogate information presented was 6, 11, or 16, to give respondents greater freedom to predict more extreme values than the surrogate value.

Method

Participants

Respondents were recruited and incentivised as per previous studies (respondents were not recruited from the same universities who had been contacted previously). 213 respondents took part (6 staff and 207 students), 65% of which were female. Ages ranged from 18 to 51 years with a mean age of 23 years.

Results and Discussion

We again observed that respondents' forecasts discounted extreme surrogate values. Three one-sample t-tests revealed that respondents who received the surrogate information of 6 made predictions for their own happiness that were significantly happier than the reported happiness of the surrogates, $t(71) = 5.10$, $p < 0.01$, $r = 0.52$; respondents who received the surrogate information of 11 predicted no difference in their happiness compared to the surrogates, $t(75) = 0.23$, $p = 0.82$; and respondents who received the surrogate information of 16 made predictions that were significantly less happy than the reported happiness of the surrogates, $t(64) = -5.60$, $p < 0.01$, $r = 0.57$ (see table 4).

The critical question for this study was whether increasing the scale to allow more extreme responses reduced the amount of discounting we observed. We analysed the number of responses that were above, below and equal to the surrogate value and compared it to the corresponding responses in study 4. A 3 (surrogate value: high, medium, low) x 3 (responses: greater than surrogate value, equal to surrogate value, less than surrogate value) x 2 (study: study 4, study 5) loglinear analysis showed that the surrogate value x response interaction, $\chi^2(4) = 80.77$, $p < 0.01$, did not vary between the two studies - the three-way interaction was not significant, $\chi^2(4) = 1.58$, $p = 0.81$. We conclude that the discounting of surrogate information is unlikely to be due to any artefact caused by scale end-point effects.

General Discussion

Our studies have shown that people incorporate knowledge about the happiness of others into their forecasts when predicting the impact of a health state on their own happiness. We also showed that when health state information was withheld, people increased their use of surrogate information as a basis for their predictions. This is consistent with previous research (Gilbert et al., 2009; Norwick et al., 2006) and corroborative of Gilbert's (2006) claim that affective forecasts can be improved by withholding event information and providing only surrogate information.

Critically, from our perspective, the influence of surrogate information was reduced by the presence of event (health state) information; respondents incorporated surrogate information less into their predictions when presented with both types of information than when only presented with surrogate information. As we noted in the introduction, in many practical contexts it will be virtually impossible to exclude event information from people contemplating surrogate information, which, given its strong influence on judgment, places limits on the value

of the surrogate information proposal. Despite this, when surrogate information was available together with event information, people used both types of information. In cases where the surrogate value is an accurate indicator of the impact of an event, informing people about the happiness of others' can help them to make more realistic forecasts both with and without event information. However, because people place emphasis on event information, they do not maximise the utility of the information presented. As Gilbert (2006) suggested and as Gilbert et al. (2009) showed, people do not fully appreciate the value of surrogate information and instead favour using event information to imagine how the event would affect them differently to others.

Even when it was the only information provided, respondents discounted the surrogate information and imagined that their life would be different to the surrogates. This discounting of surrogate information was not affected by excluding pre-existing knowledge about the target event, changing the size of the surrogate sample, or increasing the size of the response scale. Despite respondents having no information about the target event - bar the fact that it was some kind of adverse health state - and limited surrogate information, they still adjusted from the information they are provided with, suggesting that withholding event information had not successfully blocked their imaginations. Using only surrogate information as a guide to future emotions is a good way to improve predictions but due both to the tenacity of imagination and because people believe they are different to others, it is not a panacea for eliminating all the bias in affective judgments.

A limitation of our studies is that they all involved respondents contemplating their reactions to imaginary situations. It is possible that patients confronted with real diagnoses of chronic health conditions and given surrogate information would react somewhat differently,

though it is easier for us to imagine that their forecasts might be more – rather than less – extreme than those we observe here.

In several of our analyses data were compared across studies, and we acknowledge that sampling differences could have contributed to any effects. However we feel that these have been kept to a minimum as the type of respondents, the method of recruitment, and the nature of the questionnaires were consistent across the studies.

Our studies have shown that people do not spontaneously maximise the value of information about other peoples' happiness when forecasting their own happiness. Future research should address whether the discounting of surrogate information could be reduced by guiding people as to the value of this information. The surrogacy proposal could be more effective as a remedy for biased judgments if people could be persuaded that surrogate information was a good guide to their own happiness.

In the introduction we discussed the possibility that people might disregard surrogate information because they believe they are different to others. Future research could explore this further by examining whether making the surrogate more similar to the respondents reduces the discounting of surrogate information. It is plausible that if respondents perceive that they have more in common with the surrogate, then they might be more willing to incorporate surrogate happiness into their forecasts.

Our research indicates that in many practical settings, even though it is often not possible to withhold event information, providing surrogate information alongside event information would help people to envisage their future. Knowing the well-being of people living with a health state as well as information about the health state, should help people more realistically imagine the impact on their own well-being. Similarly, being informed of the well-being of

company employees alongside information about a job could help potential applicants determine their enjoyment on being hired. Although people do not use knowledge about the happiness of others to their best advantage, incorporating this information with event information should help them to more realistically anticipate the future.

Affective forecasts underlie many life decisions and as a consequence many decisions may be suboptimal because affective forecasts are biased (Sevdalis & Harvey, 2007). Although progress has been made towards improving affective forecasts, our findings indicate that more needs to be done to exploit the full potential of surrogation.

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Footnotes

[1] Amount of detail provided about the health state was explored but as no significant effects were found of this manipulation, data are reported collapsed into one group.

[2] Analyses revealed that self/other predictions did not depend on the order in which these questions were asked so all subsequent analyses were collapsed across this variable.

Table 1

Mean (and Standard Deviation) Predicted Happiness 1 Year after Living with Kidney Disease

Condition	Predicted Happiness
Only surrogate information	5.69 (1.31)
Only health state information	3.83 (1.72)
Surrogate and health state information	4.36 (1.70)

Note: Surrogate information was 6.5 on a 1 (*not happy*) to 9 (*very happy*) scale. Predicted happiness was rated on the same scale.

Table 2

Mean (and Standard Deviation) Predicted Happiness 1 Year after Living with Kidney Disease

Condition	Viewpoint	Predicted Happiness
Only surrogate information	Self	3.20 (1.42)
	Other	3.17 (1.55)
Surrogate and health state information	Self	3.36 (1.71)
	Other	3.05 (1.57)
Only health state information	Other	3.09 (1.64)

Note: Surrogate information was 2.5 on a 1 (*not happy*) to 9 (*very happy*) scale. Predicted happiness was rated on the same scale.

Table 3

Mean (and Standard Deviation) Predicted Happiness 1 Year after Living with Health State, and Percentage of Happiness Ratings Less Than, Equal to, or Greater Than Surrogate Value.

	Study 3 – surrogate sample 10		Study 4 - surrogate sample 1000
Surrogate information	Health state information		Health state information
	Yes	No	No
Surrogate information 3	4.59 (1.79) >18%,= 7%,< 75%	3.95 (1.71) >20%, =22%, <58%	4.01 (1.61) >15%, =25%, <60%
Surrogate information 5	5.01 (1.99) >40%, =17%, <43%	4.78 (1.73) >38%, =24%, <38%	5.07 (1.42) >36%, =26%, <38%
Surrogate information 7	5.42 (1.96) >71%, =15%, <14%	5.85 (1.62) >65%, =22%. <13%	5.97 (1.51) >57%, =28%, <15%
No surrogate information	4.49 (1.87)	-	-

Note: Surrogate values and predicted happiness were rated on a 1 (*not happy*) to 9 (*very happy*) scale.

Table 4

Mean (and Standard Deviation) Predicted Happiness 1 Year after Living with Health State, and Percentage of Happiness Ratings Less Than, Equal to, or Greater Than Surrogate Value

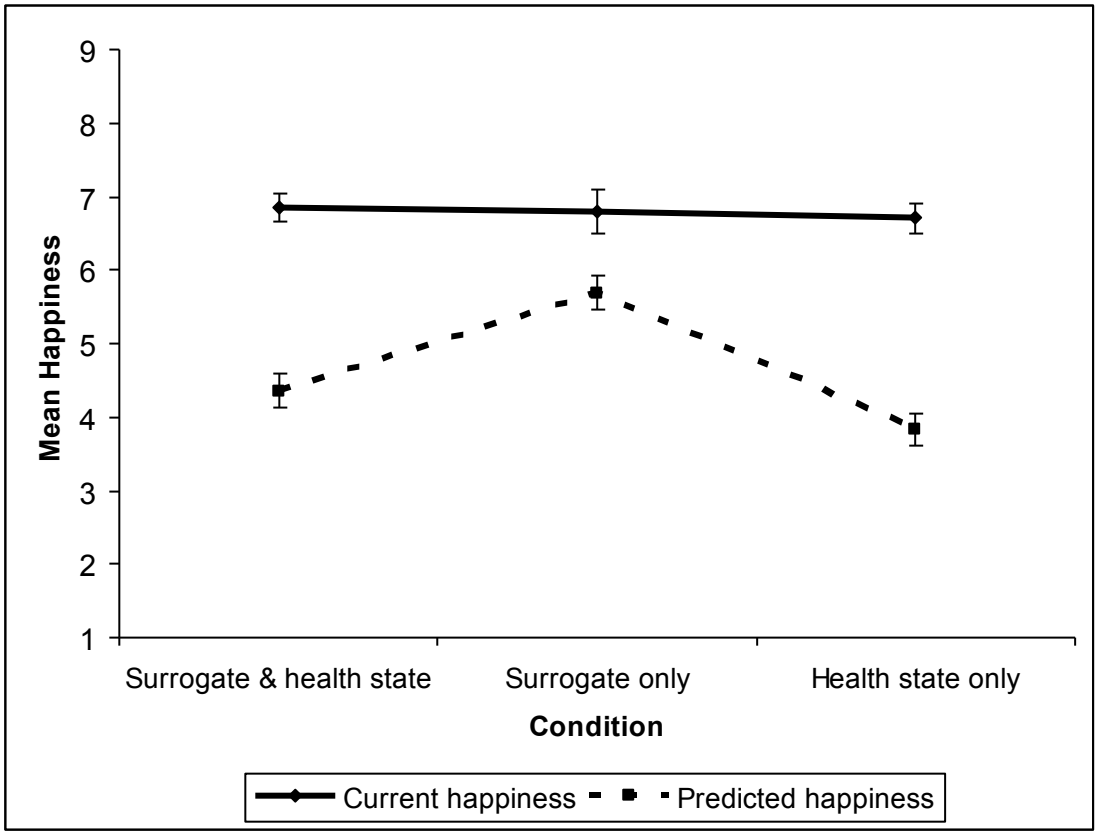
	No, health state information Surrogate sample 1000
Surrogate information 6	8.19 (3.65) >19%, =19%, <62%
Surrogate information 11	11.10 (3.67) >41%, =13%, <46%
Surrogate information 16	13.10 (4.18) >62%, =19%, <19%

Note: Surrogate values and predicted happiness were rated on a 1 (*not happy*) to 21 (*very happy*) scale.

Figure Captions

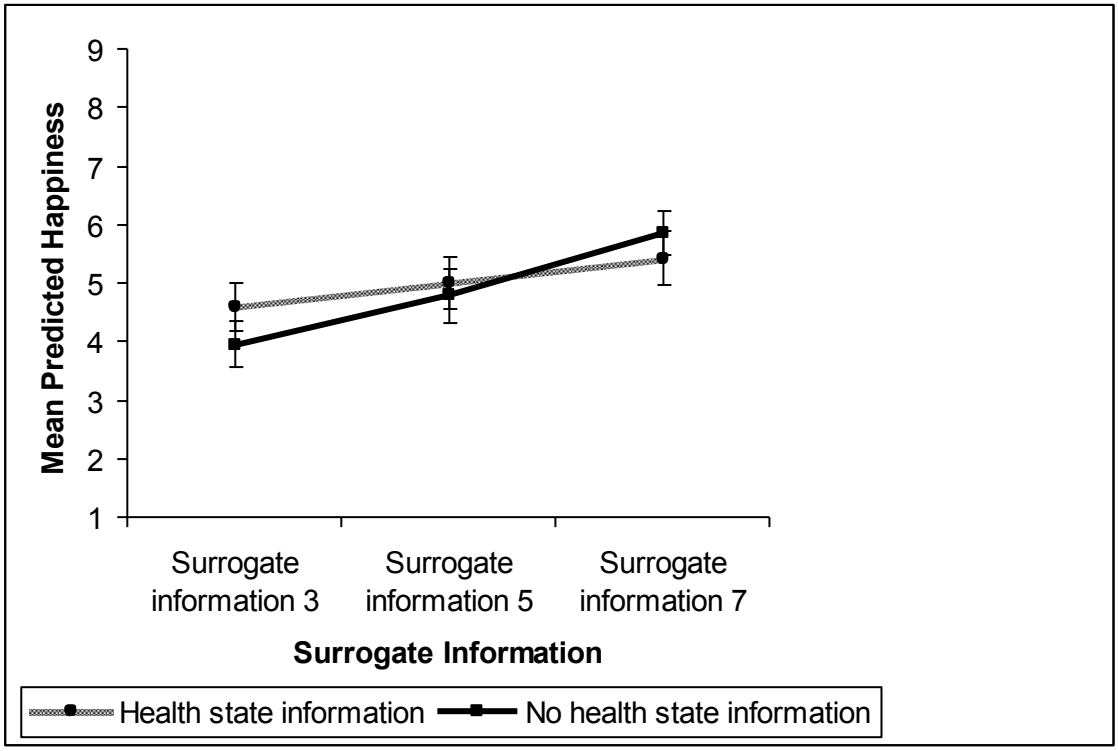
Figure 1. The interaction between happiness rating and condition (study 1)

Figure 2. The interaction between health state information and surrogate information (study 3)



Note: Surrogate information was 6.5 on a 1 (*not happy*) to 9 (*very happy*) scale. Current happiness and predicted happiness were rated on the same scale. Error bars represent 95% confidence intervals.

Figure 1.



Note: Surrogate values and predicted happiness were rated on a 1 (*not happy*) to 9 (*very happy*) scale. Error bars represent 95% confidence intervals.

Figure 2.