Great Expectations: The Role of Implicit Current Intentions on Predictions of Future Behaviour

by

Amanda Wudarzewski

A thesis

presented to the University of Waterloo

in fulfilment of the

thesis requirement for the degree of

Master of Arts

in

Psychology

Waterloo, Ontario, Canada, 2011

Author's Declaration

I hereby declare that I am the sole author of this thesis. This is a true copy of the thesis, including any required final revisions, as accepted by my examiners.

I understand that my thesis may be made electronically available to the public.

_____

Amanda Wudarzewski

Abstract

I present behavioural data contributing to existing research that (implicit) self-predictions are overly reliant on current intentions at the time of the decision (Koehler & Poon, 2006). Results are consistent with previous findings that self-predictions are often insensitive to translatability cues and overly influenced by desirability cues. We show that although participants typically benefit from a reminder, it is undervalued at the time of the decision (Experiment 1 & 3a) as participants are not willing to pay for a reminder service, unless it is offered free of charge (Experiment 2). Our findings also show that participants fail to incorporate temporal delay sufficiently in their opt-in decisions, even though temporal delay was found to be a significant predictor return behaviour (Experiments 1, 2 & 3b). Instead, decisions were found to be highly influenced by desirability factors (Experiments 1 & 2) which were not significant predictors of task completion. Finally, using a construal manipulation intended to induce participants to think about the decision options in either a concrete or abstract way influenced decisions (Experiment 3a), and subsequently influenced how much participants benefitted from the reminder in task completion (Experiment 3b).

Acknowledgements

This thesis is dedicated to all of my friends and family who have supported me along the way, throughout high-school and now onto my PhD. A special shout-out belongs to my mother Danuta Wudarzewski and my father Vis Wudarzewski for their unconditional love and devotion to my education and well-being. This research would not have been possible without the devoted time and energy of my faculty supervisor, Derek Koehler. I would like to thank my readers, Jonathan Fugelsang and Richard Eibach for their insightful comments and suggestions. Finally, I would like to thank everyone else who contributed to any part of this thesis; your help is greatly appreciated.

Table of Contents

List of Figures

List of Tables

Introduction

It is not surprising that there are many situations in the real world where people must decide to forgo a small immediate reward for one that is larger but delayed. For example, people who are dieting must refrain from dessert in the hopes of reaching their long-term reward of weight loss. In consumer situation, what would you do if you were presented with the choice of using a $1 coupon today or a $5 coupon that could be used in a future shopping trip? In both of these situations, the events rely on making predictions about future behaviours; however these predictions hold uncertainties with regards to their outcome. One must decide whether they will ultimately stick to their diet, or decide whether they will be making a shopping trip later that month. The current paper examines what factors affect predictions of future behaviours and whether or not these factors are predictive of actual future behaviour, with a focus on how such self-predictions affect consequential decisions.

Role of Self-Predictions in Decision Making

Expected value theory is a normative theory of decision making of how people should make decisions under uncertainty. The idea is that if there is uncertainty or an unknown probability regarding possible outcomes of the decision, then the person will select the option that has the highest expected value (EV). EV of choice can be written as:

$$EV\{x\} = P1V1 + P2V2 + \ldots + PnVn,$$

Where P represents a probability of each specific outcome and V represents the utility of the gain or loss associated with the specific outcome. Maximizing EV means that a decision maker given a choice should select the action which will yield the highest expected value over the long run. Often the relevant outcome probabilities are not known but rather must be estimated, subjectively, by the decision maker. Subjective probability is the perceived likelihood that a consequence will occur as a result of the specific behaviour. The normative theory of choice under uncertainty assumes that a person will maximize subjective expected values, using their subjective probabilities. This theory assumes that probabilities and utilities can be calculated by the decision maker.

The present research focuses on the role of (implicit) self-predictions of future behaviour in decision making. Consider a simple example in which a person can either receive a smaller amount $X with certainty, or a greater amount $Y if he or she carries out a certain behaviour B at future point in time. This decision requires a comparison of the expected value of the two options. In particular, the EV of the second option depends on the perceived or self-predicted probability that future behaviour B will in fact be carried out; that is, the EV of this option is P(B) x V($Y). Making a good decision in this situation, then, requires that the decision maker accurately estimate P(B), the likelihood of future behaviour B.

Much research now however focuses on how many evaluations of probabilities toward future events are distorted, and are in fact susceptible to a number of cognitive biases (or heuristics) which may lead to behavioural errors that have costs associated with them (Tversky & Kahneman, 1973; 1979). One cognitive bias that is often observed with regards to self-prediction of future behaviours is the over-optimistic effect.

Over-Optimistic Effect

When it comes to predicting task completions people tend to be over-optimistic with respect to the duration that the task will take. This is often called the "*planning fallacy"* (Kahneman & Tversky, 1979) and it is the tendency for people to predict they will finish projects earlier than they do. This effect has been examined and found across many different domains. For example, when asked to predict how long it would take for a task to be completed, people often set inappropriately shorter completion deadlines that do not match up with actual completion times. The effect has been examined in-lab, with a formatting task (Weick & Guinote, 2010), and has been extensively researched in more applied situations such as: completion date for an honours thesis (Buehler, Griffin, & Ross, 1994); Christmas shopping (Buehler & Griffin, 2003); completing tax forms (Newby-Clark et al., 2000); personal savings (Koehler, White & John, 2009); donating blood (Koehler & Poon, 2006), and proof-reading an assignment (Ariely & Wertenbroch, 2002).

In these and in many prediction studies, self-predictions are measured via estimates of date completion. In other tasks such as assignments or formatting documents, self-predictions are measured by an estimate of how long they believe a task will take to complete. This estimate is then compared to the task's actual completion date or duration. The common result is that the predicted task completion date/time is largely over-optimistic with regards to the actual task completion date/time. In other words, people typically underestimate the amount of time the task will take to complete.

Some studies utilize probability scales to measure how likely one is to carry out a future behaviour. For example, Koehler and Poon (2006) used a 0-100% probability scale to elicit self-predictions of future behaviour and reported that the predicted probability exceeded the factual

rate of the target behaviour. In the current research, I examine the decision that a person makes in a genuine dichotomous fashion (either a person chooses to commit to a behaviour or not) and use this as an implicit measure of intention strength. Although this method does not directly measure intention strength, it indirectly assumes that a person's response is contingent on their intentions to carry out the behaviour.

F*actors Influencing Predictions about Future Behaviours*

Although there is some research which suggests that optimistic predictions can in some cases facilitate behaviour, as in have self-fulfilling effects on behaviour, many different cognitive processes have been used to help explain the underlying effects of the over-optimistic effect. Soman (1998) suggests that people often underweight the negative value of future effort because this future effort is not salient at the time of making the decision. So although a choice may seem attractive at the time of making it, the event may become unappealing when it actually comes to exerting the effort to follow through with the task. Based on this notion, although people at the time of a decision may have high intentions in completing a task in the distant future, they may be subsequently less likely to follow through with it (compared to the near future). However, where future effort is salient predictions of future behaviour should reflect this, resulting in an increased likelihood of carrying out the behaviour.

The idea that less reliable knowledge and information is available in order to make a fully informed decision when making a decision based on the distant future, is also compatible with temporal construal theory. Trope, Liberman, and Wakslak (2007), maintain that predictions regarding distant future events are more based on the desirability of completing the behaviour, whereas predictions regarding temporally near events are based more on the feasibility (the ease of difficulty of reaching an end state) of the behaviour, such that decisions regarding near future events may exhibit a stronger intention – behaviour relationship (Trope & Liberman, 1998). The authors entertain the idea that overoptimistic decisions regarding future behaviours may be reflecting an underweighting of feasibility.

A focus on potential obstacles may also affect predictions. Research shows that people are more concerned with potential obstacles that may interfere with the target behaviour when making self-predictions about a task that is temporally closer in time. However when the target behaviour is temporally further in the future, people tend to underestimate the extent to which these obstacles that may hinder performance (Peetz, Buehler, & Wilson, 2010).

All of this research suggests that at the time of a decision, there is an inaccurate use of informational cues at the time of the decision that makes self-predictions susceptible to over-optimism with regards to future behaviour. Specifically I maintain that the decision-maker relies on the strength of their current intentions, which is often overweighed at the time of the decision, and subsequently leads to self-predictions being over-optimistic with regards to actual future behaviour.

Intention-Based Predictions

The theory of planned behaviour (Ajzen & Madden, 1986; Ajzen, 1991) recognizes intention strength and perceived behavioural control as the two key predictors of future behaviour. However, predictive accuracy dwindles when new and unfamiliar factors enter the situation. When the situation is under complete behavioural control of the person, behaviour is readily predicted by intentions alone. In general, the stronger the intention, the more likely it is that the behaviour will be carried out. The predictive accuracy of intention strength is higher when intentions remain relatively stable across time and when complete control is achievable. Furthermore, translatability factors (how readily the intentions can turn into action) affect the predictive validity of current intentions to the extent that intention strength at T1 will be a valid predictor of behaviour at T2, only when intention strength is stable over T1 and T2 and that the intention strength at T2 is readily translated into action.

Self-predictions typically place substantial weight on current intentions with respect to the target behaviour at the time of prediction (Koehler & Poon, 2006). Since current intentions are an easily accessible cue, it is used as an evaluative starting point. Although using current intentions strength is believed to be a useful cue in predicting the likelihood of future behaviour, other extraneous situational factors that influence translatability are often not considered at the time of prediction. As a result, factors increasing translatability are often undervalued and underappreciated at the time of the decision, which may result in costly consequences. In general, less weight should be placed on intentions, when the predictive validity is low. However previous research shows that intuitive predictions are often insensitive to the validity of predictive cues (Kahneman & Tversky, 1973).

Koehler and Poon (2006) examined intentions toward completing a web-based study which was offered after an initial study. Desirability cues were manipulated in order to activate stronger intentions to complete the web study. The authors found that although intentions influenced self-predictions, it had little effect in their actual behaviour. Translatability cues were manipulated by sending an email reminder to one group of participants. The reminder was found to impact task completion behaviour, but showed only a small impact on self-predictions. This provides evidence that factors influencing the predictive validity of current intentions are underweighted at the time of self-prediction.

Another study (Koehler, White & John, 2011) examined the actual costs of making overly optimistic decisions by examining predictions toward a financial savings goal with co-op students. Students were asked to predict how much they could save by the end of the term. Again, in order to manipulate translatability, some students were asked to fill out a monthly progress report designed to increase goal achievement. Those who received and completed the monthly progress reports were more likely to report reaching their savings goal at the end of the term. However, participants underestimated the impact that the savings goal program had on actual savings goal achievement and when asked to set a price they would be willing to pay for the service, the mode WTP was $0.

The Current Experiments

Most of the previous work on self-predictions, described above, has elicited explicit predictions from participants, e.g., in the form of a probability judgment. The present research focuses on how biases in self-prediction can influence decisions that are contingent on such predictions, and in particular explores the possibility that biases in self-prediction can lead to suboptimal decisions. While the Koehler et al. (2011) study on savings predictions did include an experiment investigating decisions as well as explicit self-predictions, they relied on a potential problematic self-report measure of actual behaviour. Here an objective behaviour measure is used, and a wider variety of factors influencing decisions contingent on self-predictions are investigated.

The objectives of the current research is to examine the previous finding that people often fail to accurately weigh translatability factors at the time of decision compared to actual behaviour. The current research is focused on how information cues that are available at the time of the decision will impact predictions and resulting behaviour. The information cues we manipulated are related to translatability and desirability factors[1]. In each of the experiments, participants after completing a filler task for a small amount of monetary reward are presented with the decision to forgo the smaller payment in favour of a larger amount of money to be received if they agree to (and actually complete) a second task in the future. Participants' predictions were elicited implicitly as they were simply offered a dichotomous choice of whether or not to opt to complete the second task.

[1] We cannot rule the possibility that desirability factors may interact with translatability factors. However, we doubt this is a huge concern in our studies since the amount of money offered in the experiments is quite modest. Our main aim was to choose a desirability factor that would affect the strength of intentions, and it we feel it is reasonable to believe that amount of money would influence desirability.

According to the normative model, people should base their decision in this situation on a comparison of the expected value of the two options (either taking the smaller amount S now, or opting for the larger amount L later after completing a second task T). The expected value of the second option is given by P(T) x V(L), and it should be chosen if and only if it is greater than V(S). Thus the self-predicted likelihood of completing the second task, P(T), is a critical component of the decision. Systematic biases in the evaluation of P(T), therefore, may lead to suboptimal decisions. For instance, if people are overly optimistic about their likelihood of returning to complete the second task, then the expected value of that option may be overestimated relative to that of taking the smaller amount immediately[2].

Translatability was manipulated by offering a reminder service that is intended to help increase participants' overall task completion, but is often undervalued at the time of prediction (Koehler & Poon, 1996). Depending on what condition participants are randomly placed in, the reminder service is either offered for free; may be purchased for a small fee that is deducted from the final payment upon completion of a second task; or are selected to receive no reminder. The amount of time delay between the initial task and the secondary task was also manipulated. Since participants tend to make predictions that are more overly optimistic when the target task is in the distant future (Trope & Liberman, 1997), temporal delay between the initial task and the secondary task was considered to be a translatability factor which may not be given adequate weight at the time of the prediction. Finally, monetary incentives are used to motivate participants to opt-in for the secondary task, which may ultimately lead participants to be more overly optimistic. Decisions

[2] The role of temporal discounting in opt-in decisions was largely ignored in the current experiments since it is not pertinent to the methodology and is considered to be independent of the main hypotheses of the experiments. In the current studies it is assumed that $8 tomorrow would be worth the same next week. However, it should be noted that the economic theory of temporal discounting would predict that at the time of the decision, the value of $4 next week would be discounted relative to next day.

tend to be based on incentives and amount of future effort (Soman, 1998), however since amount of future effort was not manipulated in the current studies we assume that incentives may affect decisions to a larger degree.

The two primary dependent variables in this study are (a) the proportion of participants who elect to complete the second task at a future date rather than taking the smaller immediate payment and (b) the proportion of those participants opting in who actually do return to complete the second task. Because these are dichotomous dependent variables, as suggested by Sutton (1998) we chose to use logistical regression as the appropriate way to analyze our data.

Logistic regression is related to linear regression, but rather than explaining a metric dependent measure, logistical regression is formulated to predict and explain categorical dichotomous variables. Thus in this study, all of the independent variables were coded as categorical variables and one of the categories (usually the first) is used as a reference category to which all other categories are compared. In this case, the first category of each predictor was used. The tear-down approach was utilized meaning that only significant independent variables were included in the final logistical regression analyses. Step 1 included all significant main effects and step 2 of the analysis included all of the significant interaction terms. By using the category coefficients, the model can predict the probability of the decision to complete a task based on which of the predictor categories the participants belong to. Positive category coefficients reported in the tables within this paper indicate that the likelihood to deciding to return is larger for the reference category of that variable. The Wald statistic, which has a chi-square distribution, indicates whether the B coefficient for that predictor is significantly different from zero. If it is significantly different from zero, one can assume that the variable is making a significant contribution to the prediction of the outcome.

Experiment 1

Method

Participants. 294 undergraduate students (148 men and 146 women) were recruited from the Student Life Centre to participate in a study on "Cognitive styles involved with prediction" at the University of Waterloo in Southern Ontario, Canada. The average age of the participants was 20 years, *SD*= 2.44. Eight participants were excluded from analysis because they had already completed the study.

Procedure. We employed a 2 (time delay: short vs. long) x 2 (payment: low vs. high) x 3 (reminder: reminder vs. no reminder vs. purchased reminder) between subjects design. At time 1, we gave participants an initial short filler questionnaire to complete, which included a couple relatively easy probability questions. Once completed, participants were randomly assigned to one of 12 conditions and were presented with a decision to volunteer for a second questionnaire.

Specifically, participants were then given the option of receiving $1 at the present time (for completing the initial questionnaire) or foregoing the initial payment for a chance to receive a larger incentive by completing a second questionnaire made available to complete after a certain amount of time delay. Other relevant information was also included so that participants could make their decision. We randomly assigned participants to receive either $4 (a considerably low payment) or $8 (a considerably high payment, especially for students) upon completion of the second questionnaire. Furthermore, we informed participants when they would be required to return. Participants in the short time delay condition would be required to return the next day; whereas those in the long time delay would be scheduled to return exactly in a week plus 1 day's time[3].

[3] This was done In order to keep the second session on the same day of the week for both the next day and next week participants.

Lastly, we randomly assigned participants to one of three reminder conditions. In the free reminder condition participants were promised a reminder in the form of an email the night before they were expected to return. In the purchased reminder condition, participants were presented with a choice to receive a reminder service for the cost of $1, which would be deducted from their final payment upon completion of the second session. Finally, participants in the no reminder condition were given no such information about a reminder (no email reminder was sent out) and served as our control group. If participants chose to receive the $1 payment rather than returning to complete the second questionnaire; they were thanked, compensated for their time and finished with the study.

At the second session (either next day /1 week later depending on the condition) return behaviour was measured by the probability that X number of participants who opted for the second questionnaire actually completed it. We recorded and scored participants on a dichotomous variable as either 0= did return as expected, or 1=did not return for second questionnaire. Returning participants first completed the Cognitive Reflective Task (Frederick, 2005) and the Rational Experiential Inventory (Pacini & Epstein, 1999) which measures rational and experiential thinking styles.

Hypotheses

H1: Translatability factor of reminder is expected to be underweighted in opt-in decisions relative to its actual impact.

H2: Implicit intentions are hypothesized to be less predictive at longer time intervals; therefore self-predictions will be insufficiently sensitive to this translatability factor.

H3: Monetary incentives should have an effect on self-predictions of returning (and hence opt-in decisions), although they may not have an effect on actual behaviour.

Results

Decision. Overall, 149 (51%) participants decided to take the $1 reward and chose not to complete the second portion of the study, whereas 145 (49%) chose to forego the $1 payment and opted-in to complete the second questionnaire. Only three out of 106 (3%) decided to purchased the reminder service (for a $1 cost). These participants were combined with the free reminder condition to form the reminded condition (N= 105). The other participants who chose not to purchase a reminder service were combined with the control condition to form the unreminded condition (N= 189).

In order to examine what variables were best predictors in making the decision to participate in the additional questionnaire in the future, we conducted a logistical regression analysis (N= 249). Step 1 included the payment and time delay variables and step 2 included a payment by time delay interaction term. The final overall model was significant X^2 (3) = 12.77, p= .005 (see Table 1). As expected the variable of reminder was not a significant predictor in this model. The first significant predictor in the source model was payment amount, X^2 (1) = 11.4, p= .001. The results indicate that the odds of opting in the $8 condition were .31 times higher than in the $4 condition. Time delay was also significant predictor in the model, X^2 (1) = 4.63, p= .031, indicating that participants were .48 times more likely to opt into the next week condition compared to the next day condition. A payment amount by time delay interaction was also found to be significant, X^2 (1) = 4.7, p= .03. In order to discover where the differences are, we split the file on payment amount and re-ran a regression with time delay separately for each payment amount. The

regression was only significant for the $4 condition, indicating that participants were two times more likely to opt-in into the next week/$4 condition compared to the next day/$4 condition, $X^2(1) = 4.63$, p=.031. The regression was non-significant for the $8 condition, $X^2(1) = .817$, p=.36.

Table 1.

								95% C.I.for EXP(B)	
		B	S.E.	Wald	df	Sig.	Exp(B)	Lower	Upper
Step 1	Time	-.736	.342	4.628	1	.031	.479	.245	.937
	Money	-1.175	.348	11.410	1	.001	.309	.156	.611
Step 2	Money by Time	1.038	.478	4.710	1	.030	2.823	1.106	7.208
	Constant	.736	.254	8.416	1	.004	2.087		

Task completion. Of the 145 participants who claimed that they would return for the second session, 91 people (63%) returned as promised, whereas 54 people (37%) did not. No differences were found between participants who refused to purchase a reminder and participants who were in the unreminded condition in return behaviour, $X^2(1) = 1.1$, p=.29. Given that there are no differences found between this subset of participants it is reasonable to believe that participants who refused the reminder (i.e., they didn't believe they would need one) were not more likely to return. Henceforth, for the subsequent analysis we analyzed return behaviour with these two subgroups combined to create the unreminded condition.

In order to examine what variables were best predictors of task completion behaviour, we conducted a logistical regression analysis (N= 91). Step 1 included the variables time delay and reminder, making the final overall model significant, X^2 (2) = 21.4, p< .001 (see Table 2). The first significant predictor of task completion was time delay, X^2 (1) = 17, p< .001. The results indicate that

participants were approximately 5 times more likely to return in the next day condition compared to the next week condition. The reminder variable was also near significance in the model, X^2 (1) = 2.67, p= .1, indicating that the reminded participants were 2 times more likely to return than those who were not reminded. No interactions were significant, or near significance in the model.

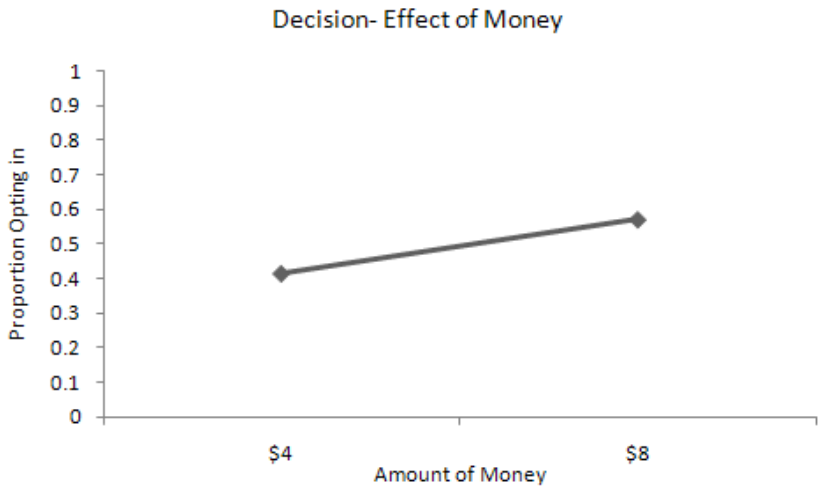
Table 2.

								95% C.I.for EXP(B)	
		B	S.E.	Wald	df	Sig.	Exp(B)	Lower	Upper
Step 1	Time	1.603	.389	17.009	1	.000	4.969	2.319	10.645
	Reminder	.660	.404	2.671	1	.102	1.934	.877	4.267
	Constant	-4.172	.996	17.558	1	.000	.015		

Summary of results and discussion. The results are consistent with the idea that the self-prediction bias is attributable to an overreliance of current intentions. Decisions to return for the second task were influenced by the desirability factor of payment amount, with more participants opting to complete the second questionnaire when the payment was high (57%) compared to when the payment option was low (41%). However, amount of money was not a significant predictor of task completion (see Figure 1). The translatability factor of time delay did not affect participants (implicit) self-predictions of returning as 52% opted in for the next week condition compared to 47% in the next day condition. However, time delay did influence task completion with 87% of participants actually returned in the next day condition, compared to only 41% returning in the next week condition (see Figure 2). Although it only approached statistical significance, the reminder was found to be at least slightly associated with an increase in task completion behaviour (p=.1),

although the reminder was undervalued at the time of decision (see Figure 3). Indeed only three participants purchased the reminder service, further showing that the reminder was underutilized by participants. Finally, a time by money interaction indicated that predictions were more sensitive to time delay when participants were in the $4 payment condition, being more likely to opt in, next week vs. next day (see Figure 4).

Figure 1.



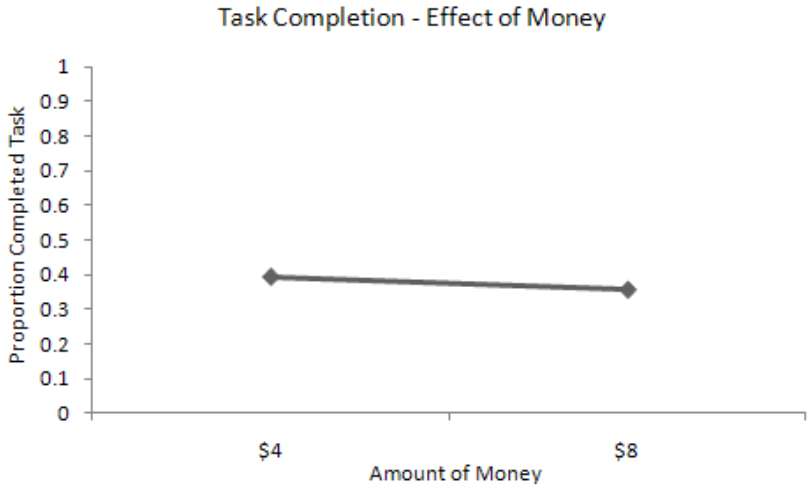
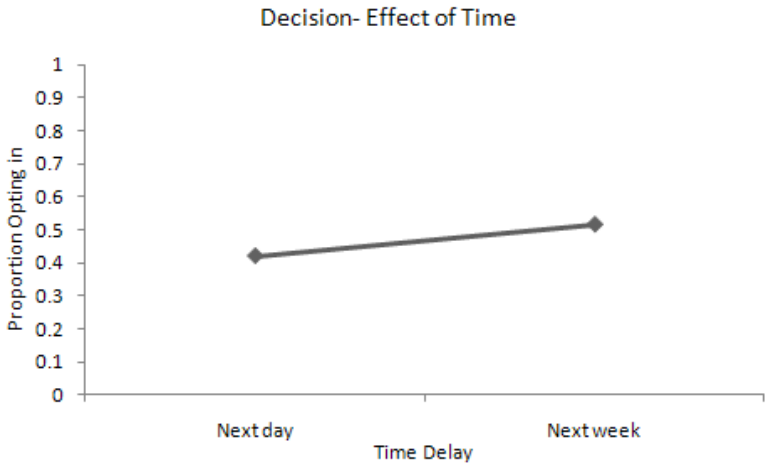


Figure 2.


Decision- Effect of Time
Proportion Opting in
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
Next day
Next week
Time Delay

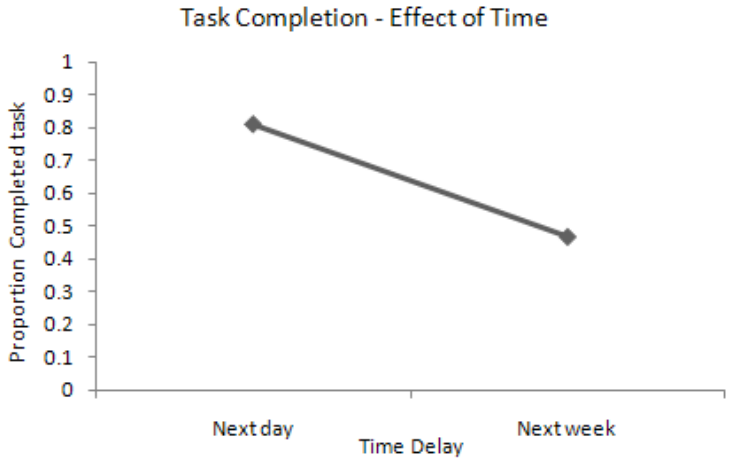
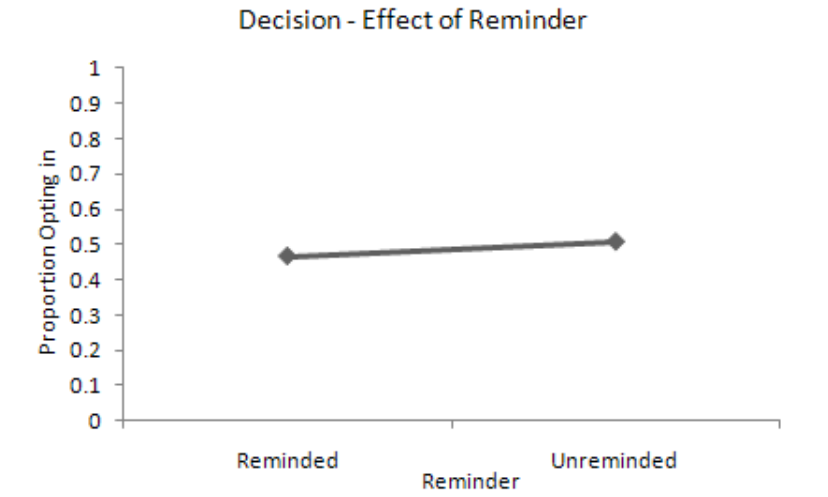

Task Completion - Effect of Time
Proportion Completed task
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
Next day
Next week
Time Delay

Figure 3.


Decision - Effect of Reminder
Proportion Opting in
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
Reminded
Unreminded
Reminder

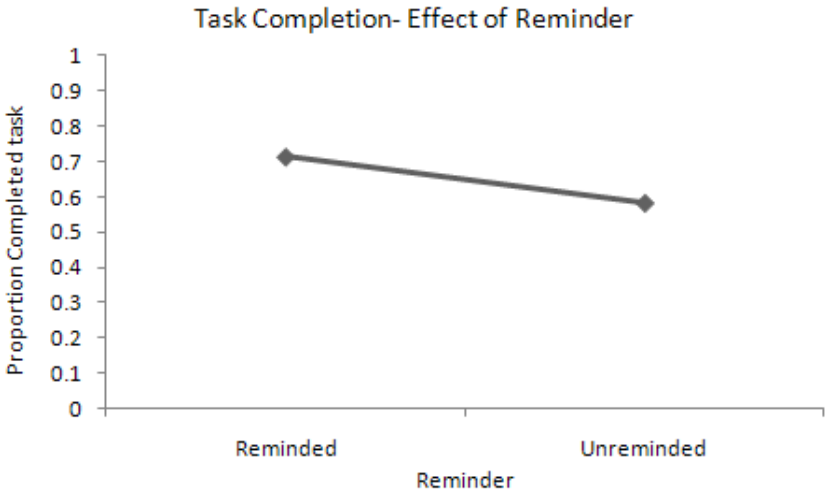
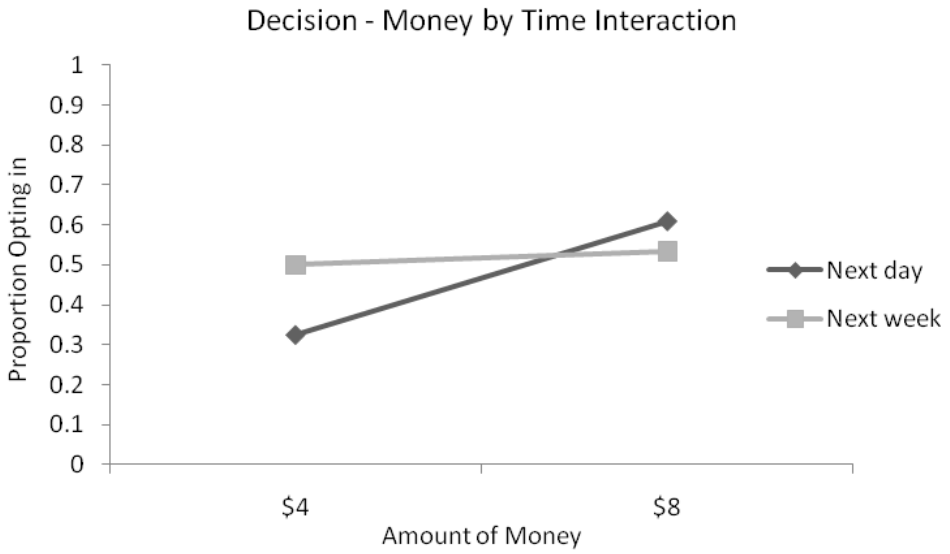

Task Completion- Effect of Reminder
Proportion Completed task
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
Reminded
Unreminded
Reminder

Figure 4.



Note. **This result is inconsistent with the economic prediction involving temporal discounting, which would predict that the decision of $4 next week would be discounted relative to $4 next day. This further suggests that temporal discounting did not pose a problem in our studies and in fact shows that we are obtaining the opposite pattern of what temporal discounting would predict.**

The tendency to focus on current intentions when making (implicit) self-predictions led participants to underestimate the impact that a temporal delay would have on their behaviour. Indeed these findings are consistent with research reporting that when a future planned behaviour is temporally near, participants may be more likely to think about the potential obstacles that may hinder performance. Perhaps the low opt-in rate for the $4 condition/next day condition show that participants are better able to discern what obstacles they may encounter the next day, and therefore are better able to discern whether or not the payoff is worth the effort (i.e., the $4 payment may not have been worth it for those able to think about the near future). When the future planned behaviour is in the distant future, however, participants may be less able to consider and incorporate situational factors that may hinder performance and as a result are more influenced by the desirability of attaining the money in their predictions. So, although $4 appears to be great compensation at the time of the decision, the participant is not aware that the task will look less attractive as it comes temporally closer in time. Participants base their self-predictions on their current intentions and therefore underestimate the need for and the impact of the reminder on their behaviour, even though it was shown to marginally improve return rates.

Since our reminder service did not yield a large effect as we expected (p=.1), in the next study we made some minor changes that we hoped would increase the effect of the reminder service. We also wanted to create a comparison group for the optional purchased reminder condition, by replacing the “free” reminder condition with a “free optional” reminder condition. If participants still don’t opt for the reminder service, even when it is free, it would imply that they feel they don’t need to be reminded. If participants only choose the reminder service when it is offered for free, it implies that they undervalue the reminder service, and feel its value is not over $1. One of the flaws due to the design of Experiment 1 is that we did not have access to data on why participants did not return, we attempt to resolve this issue in the next experiment.

Experiment 2

Method

Participants. 203 undergraduate students (123 men and 80 women; 1 undisclosed) were recruited from the University of Waterloo in Southern Ontario, Canada. The average age of the participants was 21 years, *SD*= 2.12. One participant who already completed the study was excluded from analysis. Data for four participants were excluded because the amount of money in the decision box was not consistent with the other information on the sent reminders (due to human error).

Procedure. The procedure for Experiment 2 was virtually the same as that mentioned in Experiment 1, except for a few notable changes. Instead of the free reminder condition, we replaced it with a free optional reminder condition, where we gave participants the choice of receiving a reminder service free of charge (if they decided they would like to complete a second questionnaire). We also extended the reminder service to include a reminder sticker at session 1, and also gave participants the option of including a cell phone number by which they would receive a text message in addition to the email reminder the night before participants were expected to return for session 2. Participants were run during the summer term in a Mathematics building.

Upon completion of the study we attempted to get feedback from participants who did not return for the second questionnaire after agreeing to do it. Since we can only get data from those who return for the second questionnaire, we addressed this issue by sending these participants an email asking them to reply to the email with a brief description for why they did not return for the questionnaire. We were interested in finding evidence of whether participants simply forgot to return or whether they decided that the effort involved was simply not worth the amount of money that was offered as it came closer to the time to return for session 2.

Results

Decision. Overall, 126 (62%) participants decided to take the $1 reward and not complete the second portion of the questionnaire, whereas only 77 (38%) participants chose to forego the $1 payment and opted-in to complete the second questionnaire.

61 out of the 66 participants (92%) who were given a choice to receive a free reminder opted to receive one. Due to this low number, the five participants who did not choose to receive a free reminder were combined with the no reminder condition to form the unreminded condition (N= 138). Only four out of 81 participants opted to purchase the reminder service (%5), and these four participants were combined with the free reminder condition to form the reminded condition (N=65).

In order to examine what variables were best predictors in making the decision to participate in the additional questionnaire in the future, we conducted a logistical regression analysis (N= 202). The best overall model included the variable of payment amount at step 1. The overall model of best fit was marginally significant, $X^2(1) = 3.3$, p= 071. (see Table 3). The only variable to approach significance was amount of money, $X^2(1) = 3.24$ p =. 072, indicating a similar pattern as found in Experiment 1 in that more participants opting in when the payment was high ($8) vs. low ($4).

Table 3.

Variables in the Equation

								95% C.I.for EXP(B)	
		B	S.E.	Wald	df	Sig.	Exp(B)	Lower	Upper
Step 1	Money	-.515	.286	3.243	1	.072	.598	.341	1.047
	Constant	.814	.203	16.075	1	.000	2.257		

Task completion. Of the 77 participants who claimed that they would return for the second session, 53 people (68%) actually returned as promised, whereas 24 people (33%) did not return.

In order to examine what variables were best predictors of task completion behaviour, we conducted a logistical regression analysis (N= 53). Step 1 included the variable of time. The final overall model of best fit was marginally significant, $X^2(1) = 3.4$, $p = .062$ (see Table 4). The only variable that was found to approach significance was time delay, $X^2(1) = 3.4$, $p = .067$, indicating that participants were more likely to complete the questionnaire in the next day condition compared to the next week condition.

Table 4.

								95% C.I.for EXP(B)	
		B	S.E.	Wald	df	Sig.	Exp(B)	Lower	Upper
Step 1	Time	.918	.501	3.355	1	.067	2.505	.938	6.692
	Constant	-1.237	.379	10.669	1	.001	.290		

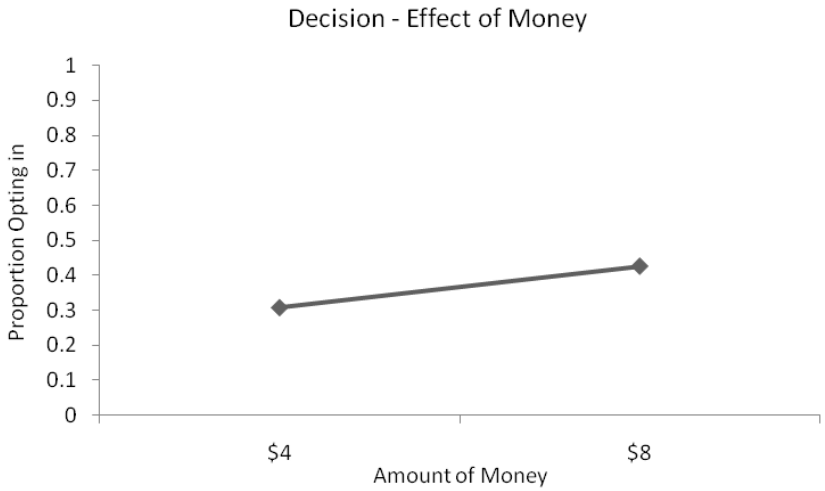
Participants in the reminded group explicitly indicated at least one of the reminders that we sent as a reason for remembering to return. Most participants in the unreminded group that returned indicated initiating their own reminders to help them remember to return. Somewhat expected, it seemed that for some participants who completed session 2, was not based on remembering to return, but rather were reminded about the target behaviour after passing by the booth and remembering that they took part in the study. Finally, participants who did not return for the second session (after agreeing to do so), were contacted. Twelve out of 24 participants who failed to return (50%) contacted us back. All of the participants, who contacted us, said the primary reason why they did not return for the second session was due to “forgetting”. This shows evidence

that participants were not necessarily discounting the future event, but simply forgot to return, due to memory failure.

Summary of results and discussion. Due to the small number of participants in each condition, many of the effects failed to reach a significant level of $p < .05$. Regardless, the patterns in this study were markedly similar to the results found in Experiment 1. At the time of the decision, participants were found to be sensitive to the desirability factor of payment amount, as more participants opted to complete the second questionnaire when the payment was high compared to when the payment option was low (43%, for the $8 condition vs. 31% in the $4 dollar condition), however amount of money was not a significant predictor of actual task completion (see Figure 5). Finally, the results show that although time delay was not a significant factor in opt-in decisions, it was a significant predictor of task completion in that 77% of participants actually returned in the next day condition compared to 58% that returned in the next week condition (see Figure 6). The reminder variable was not found to be a significant ($p > .1$) predictor in either the decision of opting in or actual task completion.

The findings add to Experiment 1 results, showing that participants are not only unwilling to pay for a reminder, but that participants will only opt into the reminder service when it is offered as an option free of charge. This contributes to the idea that participants do not value the reminder service, or they mistakenly believe they will not benefit from it when it is offered for minimal cost.

Figure 5.


Decision - Effect of Money
Proportion Opting in
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
$4
$8
Amount of Money

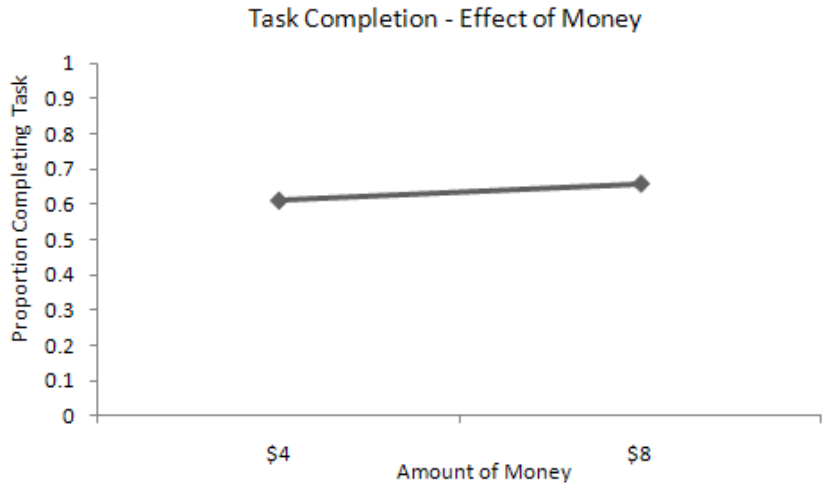
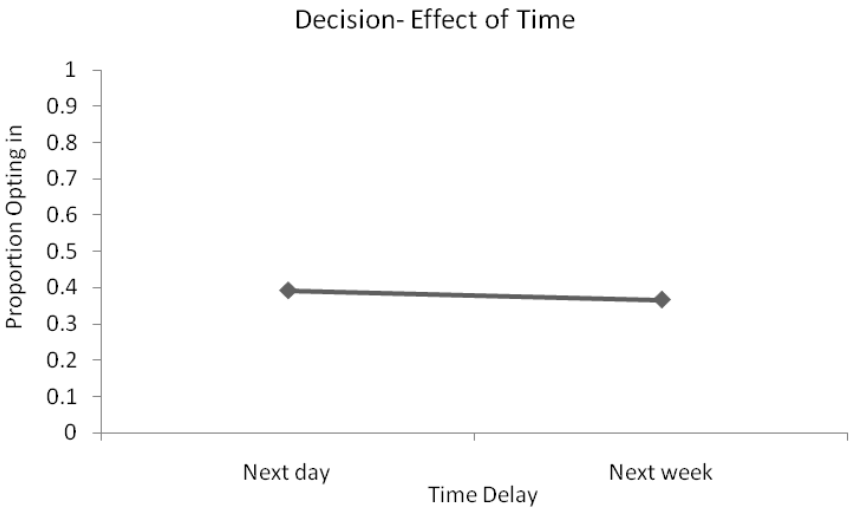
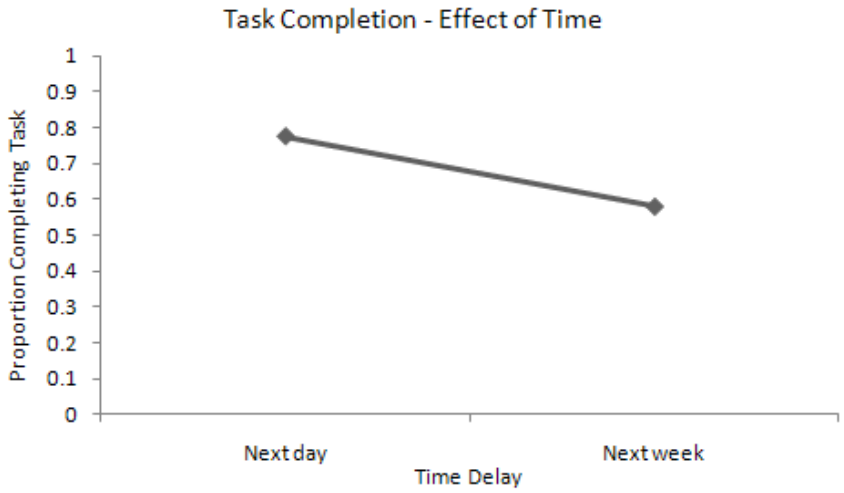

Task Completion - Effect of Money
Proportion Completing Task
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
$4
$8
Amount of Money

Figure 6.


Decision- Effect of Time
Proportion Opting in
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
Next day
Next week
Time Delay


Task Completion - Effect of Time
Proportion Completing Task
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
Next day
Next week
Time Delay

Experiment 3

So far we have shown that predictability of behaviour is influenced by various translatability cues (or the ease at which an intention can be turned into action) that are often not reflected in people's intentions at the time of a decision. Research on temporal construal theory posits that compared to an abstract construal, construing events concretely may help to identify potential obstacles that may hinder performance (and thereby lead to less optimistic decisions) (Peetz, Buehler & Wilson, 2010). For Experiment 3, we sought to examine whether construal level affects the sensitivity of self-predictions (and decisions contingent on self-predictions) to the impact of situational factors that affect how readily current intentions can be translated into future behaviour.

Since our main concern for this study was lack of power (Experiment 2), and that many participants were being "reminded" about the target behaviour spontaneously by passing the booth, a couple key changes were made to the next experiment. First, the session 2 task was modified by programming the questionnaire online in order to make completion of the task a little easier (thereby increasing opt in rates) and to ensure that return behaviour is reliant on memory rather than "being in the right place at the right time". Also, in order to recruit a large number of people, participants were recruited from two different locations; one group of participants were recruited from the SLC (referred to as Experiment 3a) as in the Experiment 1, and the other group of participants were recruited through an online participant pool (SONA) (referred to as Experiment 3b). In order to make redemption easier for those who complete the online questionnaire, payment upon completion was changed into a lottery in that participants would be entered into a draw for a gift certificate to Amazon.com (in which they would have a 1/10 chance of winning).

We ran a preliminary data analysis to examine whether we can combine the data sets from the two locations, a test of between-subjects effect was conducted on all the variables. For the

dependent variable of decision, a significant difference emerged between location and construal level, $F(1, 321) = 4.84$, $p = .028$. Similarly, for task completion a significant difference emerged between location and time, $F(1,232) = 2.97$, $p = .08$. Due to these differences between the two data sets we analyzed the data separately for the following analysis.

Experiment 3a

Method

Participants. 121 undergraduate students (57 men and 64 women) were recruited from the Student Life Centre at the University of Waterloo in Southern Ontario, Canada. The average age of the participants was 20 years, SD= 2.44. One participant who already completed the study was excluded from analysis. One additional participant who did not speak English was eliminated from the analysis.

Procedure. In Experiment 3a, we primed participants to think in either a concrete or abstract way using the mindset manipulation by Freitas, Gollwitzer and Trope (2004). Specifically those primed with a concrete mindset were prompted to answer a question focusing on "how" they will achieve a goal. Whereas those primed with an abstract mindset were asked to answer a question focusing on "why" they would like to achieve a goal. The goal that we used across all participants was how/why they would like to, "maintain a healthy lifestyle". Participants listed three ways in how/why improving and maintaining their physical health could help them meet important life goals.

After completing the manipulation task participants were presented with the choice to participate in an additional online questionnaire, which upon completion of the questionnaire would be entered in a draw where participants would have a 1 in 10 chance of winning a gift certificate. Participants at this time were also informed on how much the gift certificate would be worth ($40/$80) and also when they would be required to complete the online questionnaire (next day/1 week later). Participants also had the choice not to opt into the online questionnaire and if they chose not to participant in the future questionnaire they would instead be entered in a draw

for a $10 gift certificate. Lastly, we randomly assigned participants to one of three reminder conditions. In the free reminder condition, participants were promised a reminder in the form of an email the night before they were expected to return. In the purchased reminder condition, participants were presented with a choice to receive a reminder service for the cost of $10, which would be deducted from their final gift certificate amount, if they win the draw (making the final gift certificate worth $30 or $70). Finally, participants in the no reminder condition were given no such information about a reminder (no email reminder was sent out) and served as our control group.

Participants who decided they wanted to complete the online questionnaire were given an information card containing relevant information about the questionnaire. Specifically, participants were given a login id and a corresponding password along with a link in order for them to complete the online questionnaire. Additional email and text reminders were sent to those in the reminded group the night before they were expected to complete the online questionnaire. All gift certificate winners were drawn and contacted at the end of the term.

Hypotheses

Based on previous research, we expected to see an insensitivity of decisions to situational factors (reminder and time); and that level of construal would moderate the impact of the situational factors on decisions. As in our previous studies we manipulated situational factors by using the reminder service used in the previous studies, and time delay. This leads us to our third and final hypothesis about the factor of construal.

H4: Participants primed with a more concrete mind frame are hypothesized to be more likely to accurately weight translatability factors relative to desirability factors when making their decision to opt-in, compared to those primed with an abstract mind frame.

Results

Decision. Overall, 18 (15%) participants decided to forgo the chance at being entered in a larger draw for a gift certificate and chose to be entered in the $10 draw. 103 (85%) participants chose to forego the chance at winning a $10 gift certificate and opted-in to complete the second questionnaire for a chance at winning a gift certificate worth a larger amount of money. Seven participants out of 41 (17%) decided to purchase the reminder service. These participants were combined with the free reminder condition to form the group of participants who were reminded (N= 47). The other participants who chose not to purchase a reminder service were combined with the control condition to form the unreminded condition (N= 74).

In order to examine what variables were best predictors in making the decision to participate in the additional questionnaire in the future, we conducted a logistical regression analysis (N= 121). The only significant predictor in the overall model was that of construal level. The overall model was significant, $X^2(1) = 10.85$, $p =. 001$ (see Table 5). The predictor of construal level was significant, indicating that participants were about 7 times more likely to opt-into the online questionnaire after the concrete prime manipulation compared to those who were primed with the abstract construal, $X^2(1) = 8.23$, $p =. 004$.

Table 5.

		B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I.for EXP(B)	
								Lower	Upper
Step 1	Construal	1.903	.663	8.235	1	.004	6.705	1.828	24.591
	Constant	-2.979	.592	25.334	1	.000	.051		

Task Completion. Of the 103 participants who claimed they would complete the online questionnaire, 58 (56%) actually completed the online questionnaire, whereas 45 (44%) did not. In order to examine what variables were best predictors of task completion, we conducted a logistical regression analysis (N=58). The overall model was significant, X^2 (1) = 7.64, p =. 006 (see Table 6). The only predictor variable that reached significance was the reminder variable. As in previous results we found that participants were more than 3 times more likely to complete the online questionnaire when they were promised, and received a reminder service (72%), compared to the unreminded participants (45%), X^2 (1) = 7.22, p= .007.

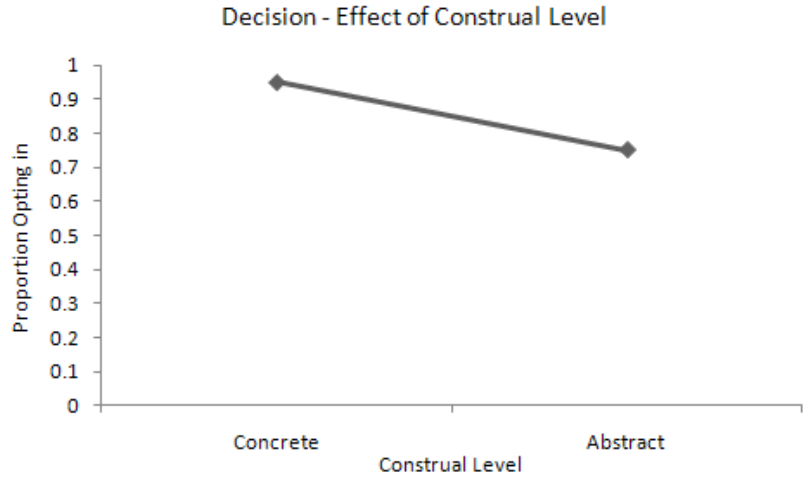
Table 6.

		B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I.for EXP(B)	
								Lower	Upper
Step 1	Reminder	1.150	.428	7.226	1	.007	3.157	1.365	7.301
	Constant	-.949	.340	7.793	1	.005	.387		

Summary of results and discussion. Construal level was found to influence the decision to complete the second task, in that 95% of participants opted to complete the online questionnaire in the concrete condition, compared to only 75% opting in, in the abstract condition. This finding is

somewhat contradictory to what was predicted. Also, unexpectedly there was no interaction between construal level and time delay on opt-in decisions. However, the finding that more participants in the concrete condition opted-in for the secondary task may indicate that participants with a concrete mind frame were more likely to believe that they would actually complete the questionnaire compared to the abstract condition. And, since there was no effect of construal on actual task completion behaviour we cannot ascertain that those in the concrete condition were actually better able to gauge their decision on translatability factors (see Figure 7). The fact that 85% of participants opted-into the second questionnaire is itself an anomalous finding since our first two experiments yielded an opt-in rate ranging from 38%-49%. Such a high opt-in rate may have cause a ceiling effect which may have eliminated any effect that may have been there. Again, for return behaviour we found evidence that even though participants were not sensitive to the reminder option at the time of the decision, those who were reminded about the online questionnaire were more likely to actually complete it, as 72% in the reminded group completed the task, and only 45% in the unreminded group actually completed the online questionnaire as promised (see Figure 8).

Figure 7.


Decision - Effect of Construal Level
Proportion Opting in
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
Concrete
Abstract
Construal Level

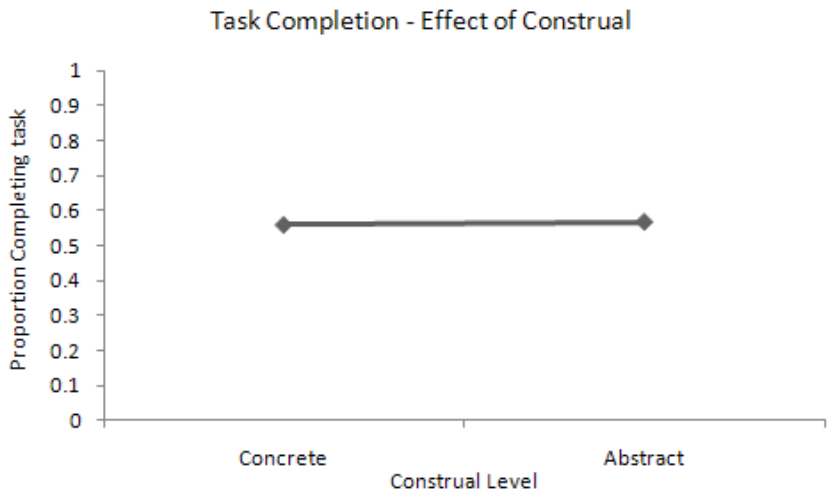
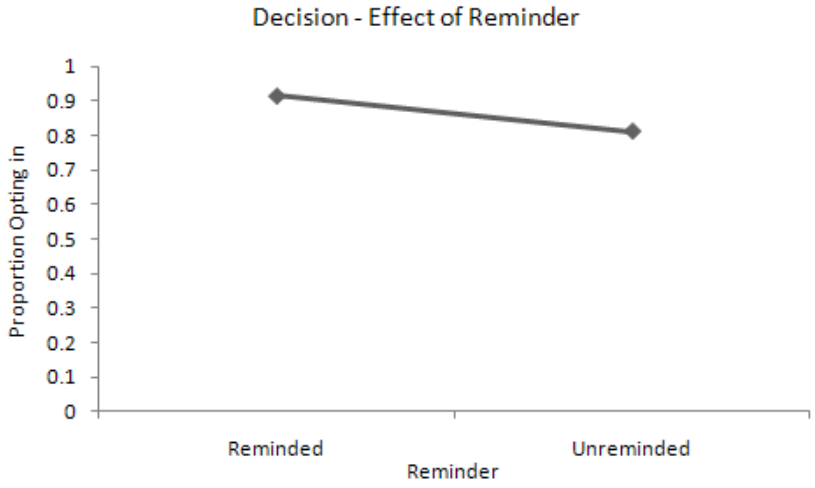
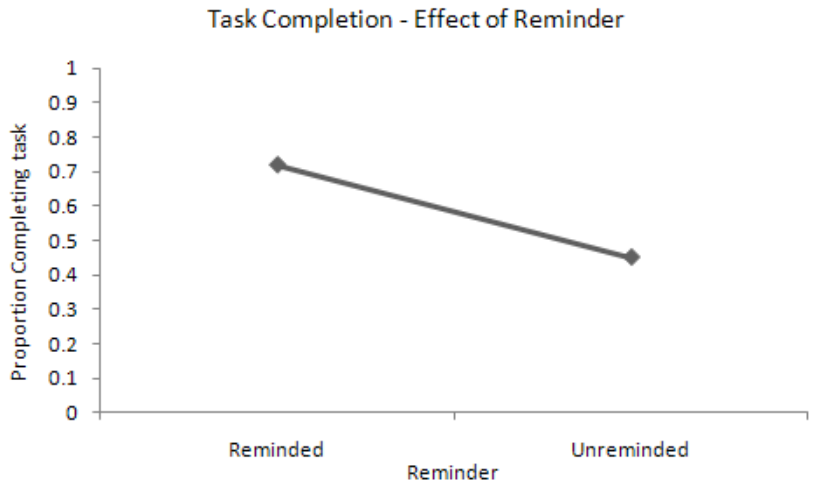

Task Completion - Effect of Construal
Proportion Completing task
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
Concrete
Abstract
Construal Level

Figure 8.


Decision - Effect of Reminder
Proportion Opting in
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
Reminded
Unreminded
Reminder


Task Completion - Effect of Reminder
Proportion Completing task
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
Reminded
Unreminded
Reminder

Experiment 3b

Method

Participants. 216 undergraduate students (70 men and 142 women; 4 undisclosed) were recruited from SONA at the University of Waterloo in Southern Ontario, Canada. The average age of the participants was 20 years, *SD*= 3.48.

Procedure. The procedure was exactly the same as that in Experiment 3a, with the two differences being; a) the location that participants were being recruited from and b) that participants received a participation credit for their time, in addition to being entered in a lottery for a gift certificate.

Results

Decision. Overall, 71 (33%) participants decided to forgo the chance at being entered in a larger draw for a gift certificate and chose to be entered in the $10 draw. 145 (67%) participants chose to forego the chance at winning a $10 gift certificate and opted-in to complete the second questionnaire for a chance at winning a gift certificate worth a larger amount of money. Eleven participants out of 69 participants (16%) decided to purchase the reminder service. These participants were combined with the free reminder condition to form the group of participants who were reminded (N= 84). The other participants who chose not to purchase a reminder service were combined with the control condition to form the unreminded condition (N= 132).

In order to examine what variables were best predictors in making the decision to complete the online questionnaire in the future, we conducted a logistical regression analysis (N= 216). The best overall model included the variables of time and reminder at step 1, and a time by reminder interaction at step 2. The overall best model of fit was significant, $X^2(3) = 14.94$ $p= .002$ (see Table 7). The time delay variable was significant, X^2 (1) = 21.4, p=.007 indicating that more participants

opted to complete the online questionnaire next week vs. the next day. The time by reminder interaction reached significance, X^2 (1) =9.7, p =. 027. In order to discover where the differences are, we split file on time and re-ran the regression with reminder condition separately for the next week and next day condition. The regression was significant for the next week condition, indicating that participants were more 4.5 times more likely to opt-in into the next week condition when a reminder service was offered, X^2 (1) = 11.27, p=.002. The regression as non-significant for the next day condition, X^2 (1) = .103, p=.748.

Table 7.

								95% C.I.for EXP(B)	
		B	S.E.	Wald	df	Sig.	Exp(B)	Lower	Upper
Step 1	Time	-1.565	.581	7.259	1	.007	.209	.067	.653
	Reminder	.134	.415	.103	1	.748	1.143	.506	2.580
Step 2	Reminder by Time	1.511	.682	4.910	1	.027	4.532	1.191	17.246
	Constant	-.539	.336	2.569	1	.109	.583		

Task completion. Of the 145 participants who claimed that they would complete the online questionnaire, 74 (51%) actually completed the questionnaire, whereas 71 (49%) did not.

In order to examine what variables were best predictors of task completion behaviour, we conducted a logistical regression analysis (N= 74).The model of best fit included the variables of construal and time delay at step 1. Step 2 included a construal by reminder interaction term. The final overall model was significant, X^2(4) = 10.87, p= .028 (see Table 8). The time variable was significant, X^2 (1) = 5.22, p=.02 indicating that participants were more than 2 times more likely to complete the online questionnaire in the next day condition (61%) vs. the week condition (43%).

A construal by reminder interaction approached significance, p=.058. In order to further examine where the differences are, we split file on construal and re-ran the regression with reminder separately for each construal condition. The results indicated that reminded participants were more likely to complete the questionnaire if they were in the abstract condition compared to the abstract/unreminded condition, X^2 (1) = 5.12, p= .027. In comparison, no differences were found in actual task completion between the reminder groups and the concrete construal conditions, X^2 (1) =.22, p = .64, indicating that the reminder service did not have as much influence on the concrete construal group.

Table 8.

								95% C.I.for EXP(B)	
		B	S.E.	Wald	df	Sig.	Exp(B)	Lower	Upper
Step 1	Time	.811	.355	5.217	1	.022	2.251	1.122	4.517
	Construal	-.700	.524	1.790	1	.181	.496	.178	1.385
	Reminder	-.070	.487	.021	1	.885	.932	.359	2.420
Step 2	Construal by Reminder	1.326	.700	3.588	1	.058	3.766	.955	14.846
	Constant	-.498	.405	1.514	1	.219	.608		

Summary of results and discussion. At the time of the decision participants were insensitive to translatability cue of time delay, as 73% participants opted in, in the next week condition (compared to 61% in the next day condition), but actual task completion was more likely in the next day condition (60%) compared to the next week condition (43%) (see Figure 9). In addition, a reminder by time interaction indicate that participants were more sensitive to the reminder service when it was offered in the next week condition compared to the next day condition (see Figure 11),

indicating that participants were somewhat more sensitive to the impact of the reminder at the long time delay vs. short time delay.

Although we did not find evidence for our hypothesis, there was a significant construal by reminder interaction that is worth noting (see Figure 12). The results show that the reminder service boosted task completion (65%) for the abstract construal condition compared to when they received no reminder (39%). On the other hand, the reminder seemed to be less effective for those primed with a concrete mind frame as no differences were found in actual task completion in either of the reminder conditions (reminded = 50%, unreminded= 55%).

Figure 9.

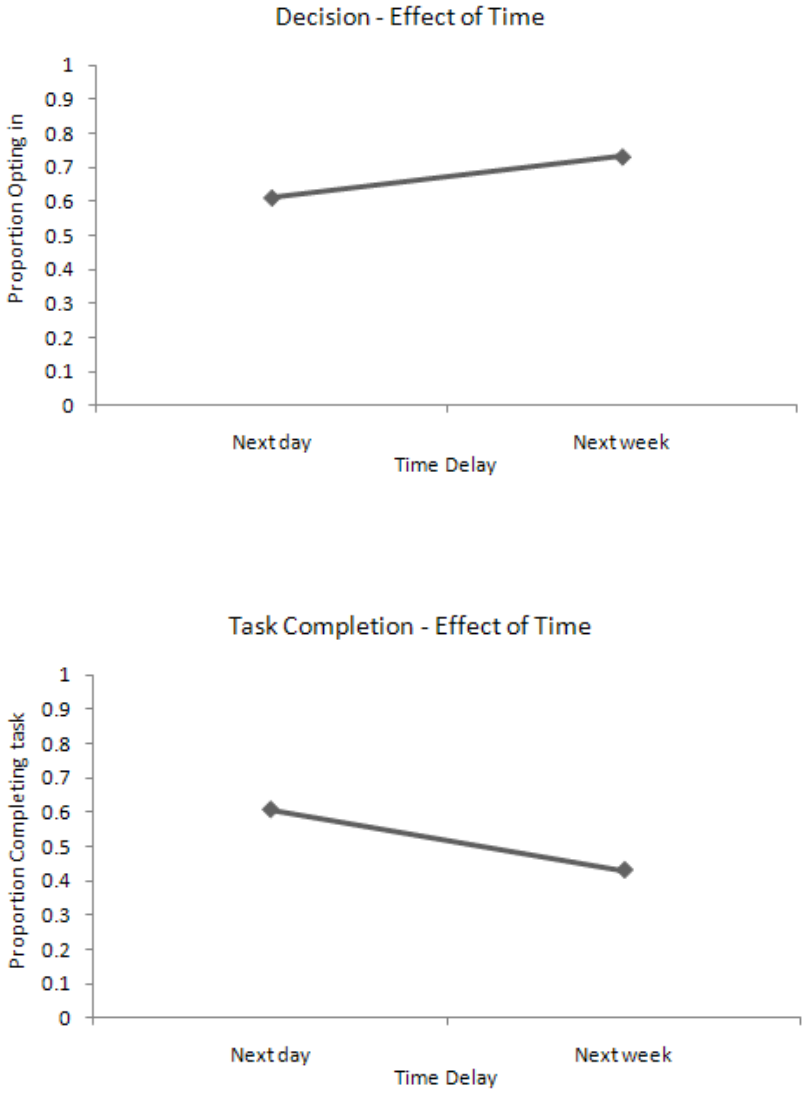
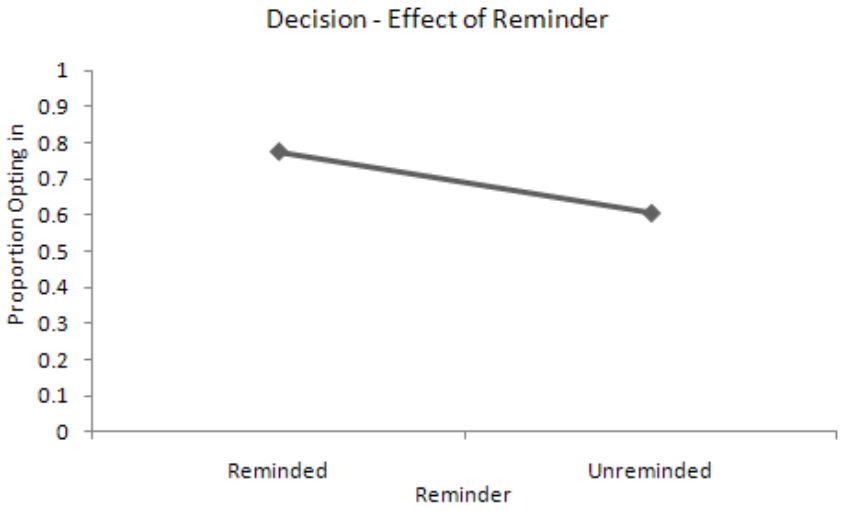

Decision - Effect of Time
Proportion Opting in
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
Next day
Next week
Time Delay
Task Completion - Effect of Time
Proportion Completing task
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
Next day
Next week
Time Delay

Figure 10.


Decision - Effect of Reminder
Proportion Opting in
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
Reminded
Unreminded
Reminder

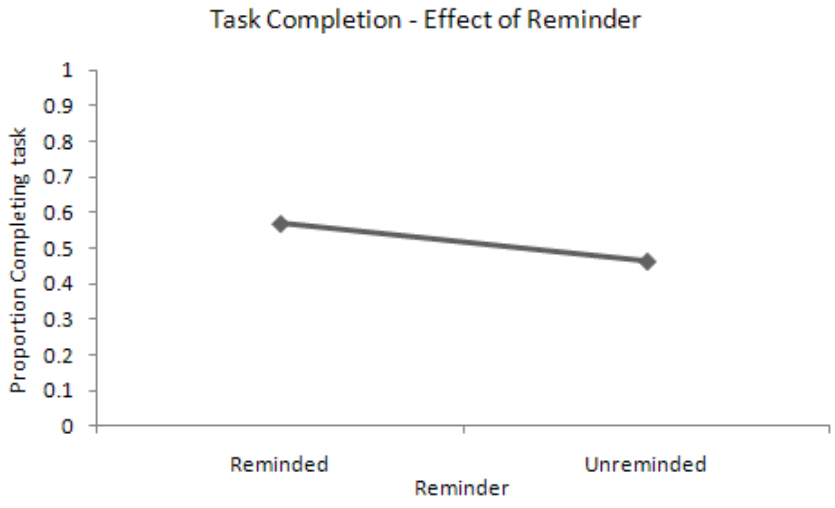

Task Completion - Effect of Reminder
Proportion Completing task
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
Reminded
Unreminded
Reminder

Figure 11.

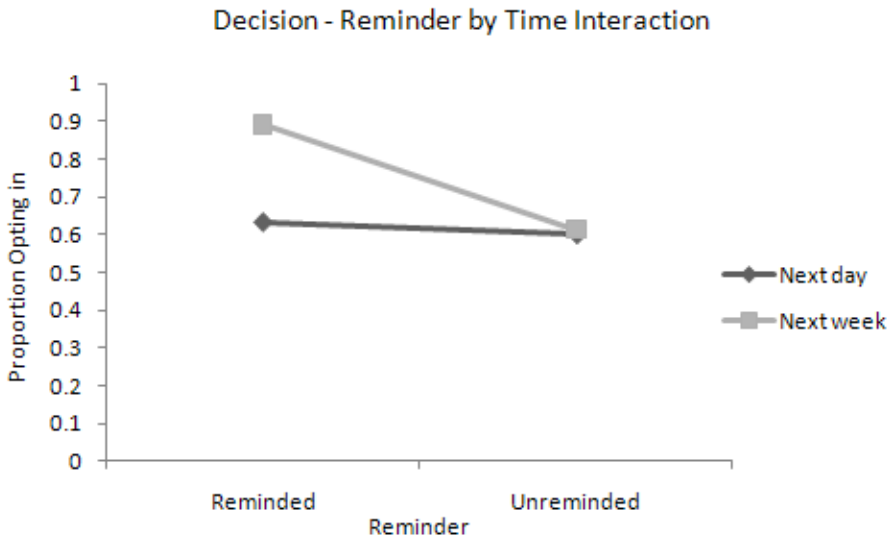
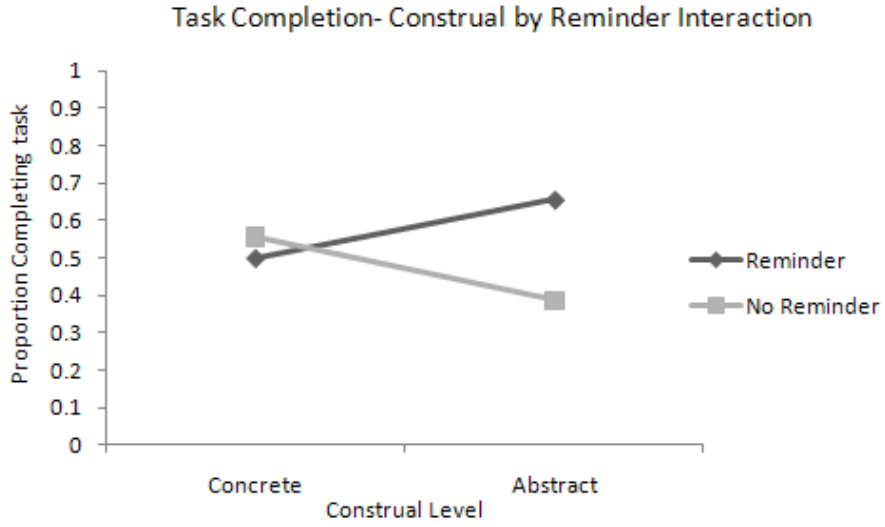


Figure 12.



General Discussion

Summary. The present research focused on the role of current intentions on self-predictions of future behaviour. The decision that participants were faced with required a comparison of the expected value of the two options. In particular, the EV of the second option depends on the perceived or self-predicted probability that a target future behaviour will in fact be carried out. Making a good decision, therefore, is dependent on whether the decision maker can accurately estimate the likelihood of carrying out the future behaviour. Across 3 experiments, we examined how factors (or information cues) that are available at the time of the decision impacted predictions (implicit in decisions) and resulting behaviour (time 2 task completion). Table 9 provides a summary of the main findings for each experiment.

Table 9.

Experiment	DV	Factor			
		Reminder	Temporal Delay	Amount of $	Construal
1	Decision		X *	X	N/A
	Task Completion	/	X *		
2	Decision			/	N/A
	Task Completion		/		
3a	Decision				X
	Task Completion	X			
3b	Decision	X	X *		
	Task Completion	X	X *		X

***Note.* "X" indicates a statistically significant effect (p<.05), a "/" indicates a marginally significant effect (P< .1).**

*** The effects of this factor were in opposite direction for decision vs. task completion.**

Overall, the results provide evidence that decisions based on (implicit) self-predictions often overweight the extent that current intentions will affect behaviour. Decisions were found to be influenced more by the desirability factors and less by factors that affect translatability, leading to suboptimal decisions. We can review the general patterns that emerged in these experiments in comparison to our hypotheses.

H1: Translatability factor of reminder is hypothesized to be underweighted in opt-in decisions relative to its actual impact.

The current experiments showed that the reminder service was greatly undervalued at the time of the decision, even though it was found to increase the likelihood of task completion. Experiment 1 found that the reminder did not influence decisions, but was found to be a marginally significant predictor of actual task completion. Experiment 2, due to low power did not show any significant differences with regards to the reminder service but did demonstrate that compared to Experiment 1 (where only 3 people chose to pay $1 for a reminder service), the reminder service was sought only when it was offered for free (92% of participants opted in for a reminder service). This suggests that there was nothing inherently unattractive about the reminder (e.g., that it was perceived as intrusive or annoying) itself; rather, when offered at a cost, participants did not feel its impact would be big enough to merit paying for it. Experiment 3a found that although decisions were not sensitive to the factor of reminder actual task completion showed a reminder effect in that those who received a reminder service were more likely to complete the secondary task. Experiment 3b showed that participants were at least slightly sensitive to the impact that the reminder would have at longer time delays, as those in the reminder group were more likely to opt into the second task when faced with a decision to carry out the behaviour next week vs. next day.

Experiment 3b also found that participants in the abstract construal condition actually benefitted more from the reminder service than those in the concrete condition, indicating that the reminder may have increased implementation intentions (Gollwitzer, 1999) more so in the abstract than in the concrete construal condition.

H2: Implicit intentions are hypothesized to be less predictive at longer time intervals; therefore self-predictions will be insufficiently sensitive to this translatability factor.

The current experiments consistently showed that participants' decisions were less sensitive to the translatability factor of temporal delay and showed evidence that the decisions were less predictive when the temporal delay was longer. Experiment 1 and 3b found that the factor of time delay influenced decisions and task completion in opposite directions, in that more people opted to complete the second task in the next week condition (vs. next day) but were more likely to actually return in the next day condition. Experiment 2 found that decisions were unaffected by the factor of time delay, but it was significant predictor in actual return behaviour. Results indicated again, that participants were more likely to complete the second task in the next day vs. next week condition. This interesting pattern reversal competes with economic theories of decision making which would suggest that temporal discounting would affect how these options are valued and would expect the pattern to be in the opposite direction; providing further evidence that temporal discounting did not play a significant part in the results.

H3: Monetary incentives should have an effect on self-predictions of returning (and hence opt-in decisions), although they may not have an effect on actual behaviour.

The experiments showed evidence that participants tend to overestimate how much the monetary outcome will affect future behaviour. Experiment 1 found this pattern, as the desirability factor of money influenced the decision to complete the secondary task, but actual task completion was unaffected by monetary incentives. Experiment 2 found marginal differences showing that decisions based on implicit self-predictions were influenced again by the monetary incentive, even though it had no influence on actual task completion. In contrast, Experiment 3a and 3b did not show any effects of money on decisions or completion behaviour. The fact that no differences were found could have been due to the way compensation was provided to participants. The payment in Experiment 3 was changed to a lottery in which participants were entered into a draw for a gift certificate (with a 1 in 10 chance of winning). The amount of money was changed from $4 to $40 (for the low payment condition) and $8 to $80 (for the high payment condition). It is possible that, compared to the sure gain of $4 or $8 in the previous studies, the lottery payment was viewed simply as a chance of winning some money, with little sensitivity to the amount of money that could be won.

> **H4:** Participants primed with a more concrete mind frame are expected to be more likely to accurately weight translatability factors relative to desirability factors when making their decision to opt-in, compared to those primed with an abstract mind frame.

Experiment 3, which had some significant changes with regards to its methodology, included a manipulation intended to induce participants to think about the decision options in either a concrete or abstract way. We collected data from two different locations to increase power, but in doing so we found significant differences in the influence of these factors depending on location. Hence, we treated the two sets of data separately. Experiment 3a did not show the proposed findings, perhaps due to the large percentage of participants opting into the second

questionnaire. However, a main effect on construal did emerge indicating that decisions were significantly affected by construal level, in that more participants opted-in for the second option when they were primed with a concrete mindset. Research on temporal construal theory posits that compared to an abstract construal, construing events concretely may help to identify potential obstacles that may hinder performance, which leads us to suggest that participants primed with a concrete mind frame may have been more accurate in predicting that their subjective probability of completing the second option future behaviour was low, hence opting more often for the immediate reward. However, since there was no effect of construal on actual task completion behaviour we cannot ascertain that those in the concrete condition were actually better able to gauge their decision on translatability factors. Finally, as mentioned before, Experiment 3b found a reminder by construal interaction showing that participants in the abstract construal condition actually benefitted more from the reminder service than those in the concrete condition.

Our research contributes to previous findings, particularly those of Koehler et al. (2011), by using an objective behaviour measure, and by examining a wider variety of factors which influence decisions contingent on self-predictions. Although intention strength was never actually measured, we reason that self-predictions that guide decisions in this task are based on current intention strength, which in turn tends to be insensitive to factors influencing translatability.

Implications. The most compelling and consistent basic finding in these experiments is the pattern reversal between the opt-in decisions and actual return behaviour on time delay. It is interested to note that the pattern found in the current experiments are inconsistent with economic theories of decision making, especially that of temporal discounting which would suggest that people would most often prefer the sooner reward and discount the value of a temporally distant reward. Instead, the results show that participants more often chose the option that is

further from the present, but are actually most likely to complete the behaviour when it is temporally closer in time. This pattern is unique and is a great demonstration in suggesting that there is a psychological discrepancy between how people believe they are going to behave and their actual behaviour, when making self-predictions of future behaviour.

Our studies are not limited to observing what variables influence the biased decision making process, but can provide insight on ways to de-bias the over-optimistic effect (Experiment 3b). In particular, we showed that the reminder service served as a cue for "how" the future behaviour could be possible, that was especially beneficial for those primed with an abstract mind frame. Perhaps, it was the mere experience of causing participants to "stop and think" about *how* they will perform the future task after already committing to the behaviour, which influenced higher return rates.

These results are consistent with some research which shows that having an abstract frame of mind may actually help sustain motivational intensity (Freitas, Clark, Kim & Levy, 2009), but extends this research by suggesting that by adding concreteness to the situation, it can help improve validity of the predictions. In other words, abstractness may emphasize how well the goal will be accomplished, and the reminder emphasizes goal completion (Naufel & Beike, 2009). The results suggest that those who frame events more abstractly may benefit more from reminders when making self-predictions of future behaviours.

These results are also consistent with other research showing that by initiating a more deliberative system, these biases can be overcome. For example, supplying feedback about people's previous performance on a similar task before prediction task duration increased predictive accuracy (Roy, Mitten & Christenfeld, 2008). Also, individuals who initially estimated their

behaviour in an ideal world subsequently make more realistic predictions (Tanner & Carlson, 2009). Research on implementation intentions suggests that people can use a self-regulating tool in the form of an if-than-plan to manage successful intentions (Gollwitzer, 1999). Finally, research on the unpacking effect, shows that when an event is "unpacked" into sub-components it can lead to better predictions (Kruger & Evans, 2004).

Future Directions. For the future, I plan on examining these effects in a more eco-logically valid context by running a natural field study. One of the more interesting findings in these studies is the reverse pattern with prediction and actual completion with regards to time delay. I would be interested in examining whether this reversal would occur in a real world situation. For example, we can run this study in a coffee shop and provide customers with an option of receiving $1 off their coffee today or receiving a $5 coupon that must be used either next week or within the next month. Opt-in rates in this scenario can be measured and actual behaviour could be tracked to see whether the customers actually return to redeem the coupons. This is an avenue worth exploring as it would be a novel finding that would contribute significantly to self-prediction literature and it would also contribute to the validity of the findings, if it were examined in a real world consumer situation.

It was difficult in the current studies to elicit explicit intention strength ratings as we feared that it would give away the purpose of the experiment. Rather than assuming that people's decisions are contingent on their intention strength, it would be beneficial for a future study to come up with a cover story which can help explain why we would like to obtain a measure of intention strength without compromising the research.

Another interesting line of future research would be to see whether participants respond differently to various types of reminders. For example, a more informational reminder may include

a lengthy script of concrete information on how to complete the future task, which can be compared to a reminder involving something much more, such as a link to the experiment which may be seen as less informative but may increase the translatability of the future behaviour. Participants who mentally construe events in either a concrete or abstract way may affect how well the reminders influence task completion behaviour.

Linking memory to the optimistic bias was not of primary interest in this paper, but does deserve some attention. In order to carry out a future behaviour, participants must draw on prospective memory. Future research might focus on the role of memory in eliciting optimistic self-prediction of future behaviour. Is it that people may fail to recall a similar experience that causes one to be overly optimistic? Or a similar experience can be recalled, but it is dismissed or incorrectly incorporated at the time of prediction? The former can be explained by the memory bias account, which is the tendency for people to remember tasks as taking less time than they actually do, leading to an underestimation of how long similar tasks will take in the future (Roy, Christenfeld & McKenzie, 2005). Other research suggests the latter often occurs, since participants like to believe that their self-prediction is independent from past experiences they tend to focus on the more optimistic scenarios and disregard the pessimistic scenarios (Newby-Clark et al., 2000). The fact that participants often do not rely on past performance appropriately when making self-predictions is an interesting area to explore in future research.

References

Ajzen, I. (1991). The theory of planned behaviour. *Organizational Behaviour and Human Decision Processes, 50,* 179-211.

Buehler, R., Peetz, J., & Griffin, D. (2010). Finishing on time: When predictions influence completion times? *Organizational Behaviour and Human Decision Processes, 111*, 23-32.

Frederick, S. (2005). Cognitive reflection and decision making. *Journal of Economic Perspectives, 19*, 25-42.

Freitas, A.L., Clark, S.L., Kim, J.Y., & Levy, S.R. (2009). Action-construal levels and perceived conflict among ongoing goals: Implications for positive affect. *Journal of Research in Personality, 43*, 938-941.

Freitas, A.L., Gollwitzer, P., & Trope, Y. (2004). The influence of abstract and concrete mindsets on anticipating and guiding others' self-regulatory efforts. *Journal of Experimental Social Psychology, 20*, 739-752.

Gollwitzer, P.M. (1999). Implementation Intentions: Strong effects of simple plans. *American Psychologist, 54*, 493-503.

Kahneman, D., & Tversky, A. (1973). On the psychology of prediction. *Psychological Review, 80*, 237-251.

Kahneman, D., & Tversky, A. (1979). Intuitive prediction: Biases and corrective procedures. *TIMS Studies in Management Science, 12, 313-327.*

Koehler, D., & Poon, C. (2006). Self-prediction overweight strength of current intentions. *Journal of Experimental Social Psychology, 42*, 517-524.

Koehler, D.J., White, R.J., & John, L.K. (2011). Good intentions, optimistic self-predictions, and missed opportunities. *Social Psychological and Personality Science, 2*, 90-96.

Kruger, J., & Evans, M. (2004). If you don't want to be late, enumerate: Unpacking reduces the planning fallacy. *Journal of Experimental Social Psychology, 40*, 586-598.

Newby-Clark, I.R., Ross, M., Buehler, R., Koehler, D.J., & Griffin, D. (2000). People focus on optimistic scenarios and disregard pessimistic scenarios while predicting task completion times. *Journal of Experimental Psychology, 6*, 171-182.

Pacini, R., & Epstein, S. (1999). The relation of rational and experiential information processing styles to personality, basic beliefs, and the ratio-bias phenomenon. *Journal of Personality and Social Psychology, 76*, 972-987.

Peetz, J., Buehler, R., & Wilson, A. (2010). Planning for the near and distant future: How does temporal distance affect task completion predictions. *Journal of Experimental Social Psychology, 46,* 709-720.

Roy, M.M., Christenfeld, N.J.S., & McKenzie, C.R.M. (2005). Underestimating the duration of future events: Memory incorrectly used or memory bias? *Psychological Bulletin, 131*, 738-756.

Roy, M.M., Mitten, S.T., & Christenfeld, N.J.S. (2008). Correcting memory improved accuracy of predicted task duration. *Journal of Experimental Psychology : Applied, 14*, 266-275.

Soman, D. (1998). The illusion of delayed incentives: Evaluating future effort-money transactions. *Journal of Marketing Research, 35*, 427-437.

Sutton, S. (1998). Predicting and explaining intentions and behaviour: How well are we doing? *Journal of Applied Social Psychology, 28*, 1317-1338.

Tanner, R.J., & Carlson, K.A. (2009). Unrealistically optimistic consumers: A selective hypothesis testing account for optimism in predictions of future behaviour. *Journal of Consumer Research, 35*, 810-822.

Trope, Y., & Liberman, N. (2000). The role of feasibility and desirability consideration in near and distant future decisions: A test of temporal construal theory. *Journal of Personality and Social Psychology, 75*, 5-18.

Tversky, A., & Kahneman, D. (1974). Judgement under uncertainty: Heuristics and Biases. *American Association for the Advancement of Science, 185*, 1124-1131.

Weick, M., & Guinote, A. (2010). How long will it take? Power biases time predictions. *Journal of Experimental Social Psychology, 46*, 595-604.