# Credit when it’s due: Timely reminders help consumers reduce their credit card debt

# Pre-analysis plan

We pre-registered this trial on the AEA Social Science Registry on 19 July 2017 and this pre‑analysis plan was lodged at the same time. While this occurred after the launch of the trial on 31 May 2017, it was before we had received any data or commenced any analysis. Our trial pre-registration can be found here: <https://www.socialscienceregistry.org/trials/2422>

In April 2018, we analysed data for month 1 of the trial, before we received data for the remaining 11 months. As a result of this analysis, we prepared a short addendum with one additional hypothesis relating to the results for subsequent months. This addendum was finalised on 24 May 2018: we did not add it to our registration but instead emailed it internally to create a time stamp.

## Background

In June 2016, the Government released a consultation paper titled ‘Credit Cards: Improving Consumer Outcomes and Enhancing Competition’ to improve consumer outcomes in the credit card market. The paper identified a set of proposed actions, some of which would be subject to consumer testing by the Behavioural Economics Team of the Australian Government (BETA) on behalf of Treasury.

This project addresses one of the issues identified in the consultation paper and focuses on credit card consumers who persistently pay the minimum credit card debt. This group is relatively small – the majority of credit card holders pay off their full balance each month[[1]](#footnote-1) and the proportion of consumers who persistently pay the minimum payment is likely to be around five per cent[[2]](#footnote-2). However, this subgroup consistently incurs high interest charges and so is likely to be subject to substantial financial stress.

The likely reasons that these credit card holders consistently pay high interest changes include:

* their pattern of credit card use, such as high balances and persistently only paying off a small proportion of the balance, and
* inappropriate selection and provision of credit cards[[3]](#footnote-3).

Various behavioural biases (e.g. optimism bias, present bias, status quo bias) are thought to contribute to problematic credit card behaviours such as over-borrowing and under-repayment. Studies have also shown that under‑repayment can also be due to ‘anchoring’, with the minimum repayment amount serving as a reference point. Consumers may pay less than their capacity to pay due to this anchoring effect.

## Trial Aim and Research Question

The aim of this trial is to help credit card consumers make repayment decisions that better suit their financial circumstances. Specifically, the trial aims to help consumers who are consistently paying only the minimum repayment amount (or close to it). Our starting point, set out above, is that at least some of these consumers are only paying the minimum due to one or more behavioural biases and so a behaviourally informed intervention may lead them to choose a repayment pattern that, on reflection, they prefer.

Therefore, this trial will examine whether behaviourally informed reminder messages suggesting that consumers pay off more than the minimum amount will change their repayment behaviour.

The overarching research question for this project is:

*Do reminder prompts and behaviourally informed messages increase credit card repayments for individuals who have persistently been making small repayments?*

## Method

## *Study population*

Westpac Bank is the industry partner for this project so the population of interest for this trial is Westpac credit card consumers who persistently pay the minimum amount (or close to it) on their credit card debt. The minimum amount is 2 per cent of the balance and payment ‘close to’ the minimum is defined as up to 4 per cent of the balance.

The eligibility criteria for the sample are consumers who:

* held a credit card for at least one year,
* paid 2% to 4% (inclusive) of their credit card balance for at least 10 out of the preceding 12 months, and for each of the most recent 3 months,
* had a credit card balance of greater than or equal to $500 the month before the trial, and
* incurred interest charges of greater than or equal to $25 the month before the trial.

Consumers on balance transfers, delinquent and written off accounts, and account-holders who are deceased or involved with legal problems were excluded from the study. (Delinquent accounts are ones where the credit card holder has failed to repay the minimum amount.)

## *Treatment and control conditions*

This trial includes six conditions (four treatment and two control conditions). They are:

1. Control 1: No message
2. Control 2: Bland reminder message – ‘Hello [Name], Payment on your Westpac credit card is due next week’
3. Treatment 1: Loss aversion + the word ‘balance’
4. Treatment 2: Loss aversion + the word ‘debt’
5. Treatment 3: Social norm + the word ‘balance’
6. Treatment 4: Social norm + the word ‘debt’

Table 1. Behaviourally informed treatment messages used in the trial

|  |  |
| --- | --- |
| Condition 3: Loss aversion + word ‘balance’ Hello [Name], Payment on your Westpac credit card is due next week. To avoid paying more interest, think about lowering or even clearing your full balance. Every extra amount can help. | Condition 4: Loss aversion + word ‘debt’ Hello [Name], Payment on your Westpac credit card is due next week. To avoid paying more interest, think about lowering or even clearing your full debt. Every extra amount can help. |
| Condition 5: Social norm + word ‘balance’ Hello [Name], Payment on your Westpac credit card is due next week. Many people choose to pay the full balance on time. Every extra amount can help. | Condition 6: Social norm + word ‘debt’ Hello [Name], Payment on your Westpac credit card is due next week. Many people choose to pay the full debt on time. Every extra amount can help. |

Individuals who receive a message (that is, all conditions except condition 1) do so in the week before their credit card payment is due. As messages are sent out in four batches­—one for each week of the month—there is variation in the number of days between the reminder message and payment due date (range 6-12 days) .

## *Treatment allocation*

Based on the eligibility criteria, the total sample size for this trial was approximately 24,000 individuals (exact number to be confirmed).

Eligible consumers were split into two groups by mode of contact: (1) those who receive email correspondence; and (2) those who receive SMS correspondence. Consumers who have only provided Westpac SMS contact details were allocated to the SMS group. Consumers who have provided Westpac both SMS and email contact details were allocated to the email group.

Within each mode of contact (email or SMS), consumers were stratified into nine strata based on their age and credit card balance. Within each strata, consumers were randomly assigned to each of the six conditions. It is estimated that there were 1,575 consumers per condition for those in the email mode and 2,430 consumers per condition for those in the SMS mode.

## Outcome variables and hypotheses

## *Outcome variables*

We will use two outcome variables for monthly analysis. While this doubles the number of tests involved, we expect that the tests on these two variables will be highly correlated: either both will show statistically significant results or both will not. If one does and the other does not, we may interpret such results as suggestive only, depending on the respective p‑values.

1. Monthly dollar repayment (continuous variable). While dollar repayments will be higher for consumers with a high balance, the random allocation means that we expect a similar proportion of participants with a high or low balance for each condition so that the average for each condition will be very similar. Therefore, even this straightforward dollar repayment amount will give us a good indicator of the treatment effect. This is also chosen as a primary outcome measure due to ease of interpretation and the ability to provide estimates of savings made to inform policy makers. Analysis will use OLS regression.
2. Monthly repayment as a percentage of the monthly balance, to be interpreted as a percentage point increase (continuous variable). The form of regression analysis – whether OLS, beta regression or another model – will be based on the distribution of this outcome variable.

We will use an additional outcome variable to assess the cumulative impact after six and 12 months.

1. Sum of monthly dollar repayments over the preceding six months (continuous variable). Analysis will use OLS regression.

Finally, we will include analysis of a secondary outcome variable. This outcome is not included in our hypotheses (set out below) and so we will interpret statistically significant results for this variable as suggestive.

1. Whether or not more than four per cent of balance is paid each month (binary variable). This can be interpreted as an odds-ratio or the uplift in the percentage of individuals (compared to the baseline) who paid more than four per cent of their balance. Analysis will use logistic regression.

## *Hypotheses*

1. *All reminder messages, including the bland reminder message, will increase repayments (for that month and cumulatively over six months) compared to no reminder message*.

This will involve five separate tests that compare the repayment for conditions 2 to 6 against the repayment for the Control 1.Treatments 1‑4 are specifically designed to prompt larger repayments (as per hypothesis) however we are less certain about the impact of Control 2 since it is just a reminder to repay and says nothing the repayment amount. If consumers are making minimum repayments mainly due to anchoring on that reference point then Control 2 may not lead to higher repayments since it seemingly does nothing to counteract that anchoring. Nonetheless, the simple fact of a reminder may prompt consumers to reflect on the amount as well as timing of repayment so we hypothesise that even a simple reminder will lead to some increase in repayment.

1. *The loss aversion message will increase repayments (for that month and cumulatively over six months) compared to the bland reminder message.*

We hypothesise that informing credit card consumers of potential losses (triggering loss aversion) will encourage them to increase their repayment compared to those receiving a simple reminder. To test this, we will compare the repayments for conditions 3-4 (combined) against the repayment for condition 2 (simple reminder).

H3. *The social norm messages will increase repayments (for that month and cumulatively over six months) compared to the bland reminder message*.

We hypothesise that informing credit card consumers that many people choose to pay off their full balance on time (a social norm) will encourage them to increase their repayment compared to those receiving a simple reminder. To test this, we will compare conditions 5 and 6 (combined) with condition 2 (simple reminder).

*H4. The debt messages will increase repayments (for that month and cumulatively over six months) compared to the balance messages.*

We hypothesise that debt may be perceived as a loss frame and balance as a gain frame. Therefore messages with debt will increase repayments compared to the balance messages. The tests for this hypothesis will depend on the results of Hypotheses 2 and 3 but, at this stage, we expect to conduct two separate tests that compare conditions 3 and 4 (loss aversion, debt vs balance), and conditions 5 and 6 (social norm, debt vs balance).

*H5. Where there are cumulative effects over six months for Hypotheses 1-4, some effect will persist six months later.*

We hypothesise that, where there is a cumulative effect from these reminder messages over a six‑month period, this will induce a change in habits for at least some consumers such that the effect (albeit potentially diminished) persists over time.

## Analysis

The hypotheses above provide the basic structure for our analysis. The full suite of point‑in‑time analyses will be undertaken at month 1, month 2, month 6 and month 12, using all of the relevant outcome variables (dollar and percentage repayment, and also whether repayment was above four per cent of balance).

At 6 and 12 months, we will also undertake analysis for outcome variable 3 (cumulative dollars repaid). At these two time points, we expect that we will also complete point‑in‑time analyses for each of the preceding months.

Several steps in our analysis will be contingent on initial results so we will use the decision tree below to determine which path to follow.

## *Analysis decision tree*

First, we will test whether there are any differences between SMS and emails for Hypotheses 1‑4 in the first month. We do not anticipate any differences in the effectiveness of the treatments between these forms of communications, so if we find no significant differences then we can collapse across these two channels and we will repeat this for subsequent months (but will report some tests of SMS against emails as a robustness check only).

Second, where we find significant treatment effects for our four hypotheses, we will explore a number of subsequent questions that could be useful for policy implications:

1. Although we have no formal hypothesis, we will examine whether the social norm treatment or the loss aversion treatment is more effective, and
2. We will also examine whether the treatments are more or less effective for different subsamples (for example, men or women; older or younger, higher or lower balances).

If we have sufficient time and resources, we may undertake supplementary analysis such as: multi‑level models for individual and group changes in behaviour over time, or investigating the persistence of the treatment effect by creating a months-since-treatment variable and including an interaction term between the treatment and the months-since-treatment variable.

## *Covariates*

Possible covariates for regression analyses are age, sex, mean repayment amount at baseline, and savings account balance at baseline. These are chosen based on the assumption that they influence credit card repayment. If we do not get information on payment history and savings history, these covariates will not be included. Covariates will not be included for exploratory analyses including subgroup analyses. We will adjust our regression models for stratification.

## *Assumptions*

The trial design relies on the following assumptions:

* Reminder messages only affect repayment amounts do not affect consumers’ other credit card behaviours. For example, we implicitly assume that consumers who make larger repayments after the reminder messages will not borrow a larger amount in subsequent months. Similarly, we assume that an extra repayment in a particular month does not affect their capacity to repay in subsequent months. There may be some avenues to conduct exploratory analysis to test these assumptions.
* Monthly snapshots (rather than daily borrowing and repayment) are adequate to understand consumers’ repayment behaviour.

## *Power analysis*

Based on 12 month pre-trial data of repayment amounts from February 2016 to January 2017, for primary outcome 1 (mean dollar repayments), the study is powered to detect a $22 difference in the email channel, and an $18 difference in the SMS channel (with alpha = 0.05 and power = 0.80). This is based on expected repayments of $294 without any intervention.

When we receive the first month of post-trial data, we will also receive updated 12 month pre-trial repayment data from May 2016 to April 2017. We will then repeat the power calculations and report the results: it is possible that the study will be powered to detect slightly different effects.

## *Missing values and multiple outcomes*

For missing data on independent categorical variables, we will replace it with information from previous waves of data for variables that are time-invariant (for example, sex). For missing data on independent categorical variables with no previous data available, we will drop these cases from analysis. For missing data on independent continuous variables, we will replace it with the mean for the condition to which they were assigned.

We expect to have very little missing data on outcome variables. We will determine the attrition rate for the overall sample and check for differential attrition between the treatment and outcome groups. If there is differential attrition, we will determine the range of the estimated treatment effect given attrition by constructing bounds.

We will not adjust for multiple comparisons however we will provide all relevant statistics to enable readers to make these adjustments if required.

## *Descriptive results*

We will also provide descriptive results for each month (for example, average balance and average interest paid by condition) to inform the interpretation of the analyses.

## Results tables

Table 2. Descriptive results

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Outcome 1 – repayment in $** | **Outcome 2- percentage repayment** | **Outcome 3-% who paid more than 4% of balance** | **Outcome 4- cumulative payments over the last 6 months** | **Outcome 5-cumulative percentage repayment amount over the last 6 months** |
| **No reminder (condition 1)** | mean, SD (n=) | mean, SD (n=) | % (n=) | mean, SD (n=) | mean, SD (n=) |
| **Simple reminder (condition 2)** | mean, SD (n=) | mean, SD (n=) | % (n=) | mean, SD (n=) | mean, SD (n=) |
| **Loss aversion + balance (condition 3)** | mean, SD (n=) | mean, SD (n=) | % (n=) | mean, SD (n=) | mean, SD (n=) |
| **Loss aversion + debt (condition 4)** | mean, SD (n=) | mean, SD (n=) | % (n=) | mean, SD (n=) | mean, SD (n=) |
| **Social norm + balance (condition 5)** | mean, SD (n=) | mean, SD (n=) | % (n=) | mean, SD (n=) | mean, SD (n=) |
| **Social norm + debt (condition 6)** | mean, SD (n=) | mean, SD (n=) | % (n=) | mean, SD (n=) | mean, SD (n=) |
| **Loss aversion messages (conditions 3 & 4)** | mean, SD (n=) | mean, SD (n=) | % (n=) | mean, SD (n=) | mean, SD (n=) |
| **Social norm messages (conditions 5 & 6)** | mean, SD (n=) | mean, SD (n=) | % (n=) | mean, SD (n=) | mean, SD (n=) |
| **Loss aversion + balance (condition 3)** | mean, SD (n=) | mean, SD (n=) | % (n=) | mean, SD (n=) | mean, SD (n=) |
| **Loss aversion + debt (condition 4)** | mean, SD (n=) | mean, SD (n=) | % (n=) | mean, SD (n=) | mean, SD (n=) |
| **Social norm + balance (condition 5)** | mean, SD (n=) | mean, SD (n=) | % (n=) | mean, SD (n=) | mean, SD (n=) |
| **Social norm + debt (condition 6)** | mean, SD (n=) | mean, SD (n=) | % (n=) | mean, SD (n=) | mean, SD (n=) |

Table 3. An example summary results table from main linear regression analyses

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Time in point outcomes (at month 1, 2, 6, & 12)** | | | **Cumulative outcomes (at month 6 and month 12)** | |
| **Comparisons** | **Outcome 1** | **Outcome 2** | **Outcome 3⊥** | **Outcome 4** | **Outcome 5** |
| **No message (control 1) vs bland message (control 2)** | Regression coefficient for control 2, SE, CI, p value\* | Regression coefficient for control 2, SE, CI, p value | Odds ratio for control 2, CI, p value | Regression coefficient for control 2, SE, CI, p value | Regression coefficient for control 2, SE, CI, p value |
| **No message (control 1) vs loss aversion + balance (condition 3)** | Regression coefficient for condition 3, SE, CI, p value | Regression coefficient for condition 3, SE, CI, p value | Odds ratio for condition 3, CI, p value | Regression coefficient for condition 3, SE, CI, p value | Regression coefficient for condition 3, SE, CI, p value |
| **No message (control 1) vs loss aversion + debt (condition 4)** | Regression coefficient for condition 4, SE, CI, p value | Regression coefficient for condition 4, SE, CI, p value | Odds ratio for condition 4, CI, p value | Regression coefficient for condition 4, SE, CI, p value | Regression coefficient for condition 4, SE, CI, p value |
| **No message (control 1) vs social norm + balance (condition 5)** | Regression coefficient for condition 5, SE, CI, p value | Regression coefficient for condition 5, SE, CI, p value | Odds ratio for condition 5, CI, p value | Regression coefficient for condition 5, SE, CI, p value | Regression coefficient for condition 5, SE, CI, p value |
| **No message (control 1) vs social norm + debt (condition 6)** | Regression coefficient for condition 6, SE, CI, p value | Regression coefficient for condition 6, SE, CI, p value | Odds ratio for condition 6, CI, p value | Regression coefficient for condition 6, SE, CI, p value | Regression coefficient for condition 6, SE, CI, p value |
| **Bland message (control 2) vs loss aversion (conditions 3+4)** | Regression coefficient for loss aversion, SE, CI, p value | Regression coefficient for loss aversion, SE, CI, p value | Odds ratio for loss aversion, CI, p value | Regression coefficient for loss aversion, SE, CI, p value | Regression coefficient for loss aversion, SE, CI, p value |
| **Bland message (control 2) vs social norm (conditions 5+6)** | Regression coefficient for social norm, SE, CI, p value | Regression coefficient for social norm, SE, CI, p value | Odds ratio for social norm, CI, p value | Regression coefficient for social norm, SE, CI, p value | Regression coefficient for social norm, SE, CI, p value |
| **Condition 3 vs 4 (to examine balance vs. debt for loss aversion)** | Regression coefficient for condition 4, SE, CI, p value | Regression coefficient for condition 4, SE, CI, p value | Odds ratio for debt-loss aversion, CI, p value | Regression coefficient for condition 4, SE, CI, p value | Regression coefficient for condition 4, SE, CI, p value |
| **Condition 5 vs 6 (to examine balance vs. debt for social norm)** | Regression coefficient for condition 6, SE, CI, p value | Regression coefficient for condition 6, SE, CI, p value | Odds ratio for debt-social norm, CI, p value | Regression coefficient for condition 6, SE, CI, p value | Regression coefficient for condition 6, SE, CI, p value |

Note: \* p values presented in this table are for comparisons (e.g. control 2 vs control 1); ⊥ the reference group for outcome 3 in most cases is either control 1 or control 2. However, for debt vs balance analyses, the reference group is the group who received the message with the word ‘balance’.

For subgroup analyses we will report these statistics for each level of the subgroup as well as differences, 95% confidence intervals and p-values for differences in treatment effects across levels.

## Data

When Westpac provide us with repayment data each month it should look something like the following table.

Table 4. Expected data format for monthly data provided by Westpac

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Trial ID\* | Age | Sex | Postcode | Mode | Condition | Date SMS/email sent | Monthly credit card account status | Interest rate | Date account due | Date statement issued | Credit card closing balance |
| 3124312 | 45 | 0 | 2346 | 1 | 3 | 22/6/2017 | 1 | 17.84% | 28/6/2017 | 16/6/2017 | $9874 |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Minimum payment due | Repayments | Charges and fees | Card limit | Card interest free day terms | Westpac savings account | Savings account balance | Westpac loan | Westpac offset account | Westpac redraw account | Redraw account balance |
| $197.48 | $250 | $8.50 | $20,000 | 1 | 1 | $2343 | 0 | 0 | 0 | $0 |

\* The Trial ID was a unique, anonymous code created by Westpac for the purpose of this study. No identifying information was shared by Westpac.

Note: The numbers in this table are fictitious. They do not represent actual trial data.

Table 5 is an example of expected data (long format) at the end of the trial when monthly datasets have been merged and Table 6 presents the data dictionary of key variables.

Table 5. Expected data format for analysis at the end of the trial period

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Trial ID\* | Wave | Batch | Mode | Condition | Credit account status | Credit card closing balance $ | Min payment due $ | Repayment $ | Charges & Fees $ | Card limit $ | Savings account | Savings account balance $ | Age | Gender | Strata |
| 1000001 | 1 | 1 | 1 | 3 | 1 | 1589 | 1258.9 | 150 | 4.20 | 10000 | 1 | 2343 | 49 | 1 | 1 |
| 1000001 | 2 | 1 | 1 | 3 | 1 | 4500 | 4216 | 280 | 5.60 | 10000 | 1 | 2789 | 49 | 1 | 1 |
| 1000001 | 3 | 1 | 1 | 3 | 1 | 2100 | 2009.7 | 350 | xxxx | 10000 | 1 | 3459 | 49 | 1 | 1 |
| 1000001 | 4 | 1 | 1 | 3 | 1 | 3489 | 3154.4 | 465 | xxxx | 10000 | 1 | 3401 | 49 | 1 | 1 |
| 1000001 | 5 | 1 | 1 | 3 | 1 | 7989 | 7500 | 780 | xxxx | 10000 | 1 | xxxx | 49 | 1 | 1 |
| 1000001 | 6 | 1 | 1 | 3 | 1 | 1475 | 1420 | 1420 | xxxx | 10000 | 1 | xxxx | 49 | 1 | 1 |
| 1000001 | 7 | 1 | 1 | 3 | 1 | 4356 | xxxx | xxxx | xxxx | 10000 | 1 | xxxx | 49 | 1 | 1 |
| 1000001 | 8 | 1 | 1 | 3 | 1 | 7816 | xxxx | xxxx | xxxx | 10000 | 1 | xxxx | 49 | 1 | 1 |
| 1000001 | 9 | 1 | 1 | 3 | 1 | 5614 | xxxx | xxxx | xxxx | 10000 | 1 | xxxx | 49 | 1 | 1 |
| 1000001 | 10 | 1 | 1 | 3 | 1 | 7890 | xxxx | xxxx | xxxx | 10000 | 1 | xxxx | 49 | 1 | 1 |
| 1000001 | 11 | 1 | 1 | 3 | 1 | 3350 | xxxx | xxxx | xxxx | 10000 | 1 | xxxx | 49 | 1 | 1 |
| 1000001 | 12 | 1 | 1 | 3 | 1 | 3240 | xxxx | xxxx | xxxx | 10000 | 1 | xxxx | 49 | 1 | 1 |
| 1000001 | 1 | 1 | 2 | 3 | 1 | 5400 | xxxx | xxxx | xxxx | 10000 | 1 | xxxx | 49 | 1 | 1 |
| 1005628 | 2 | 3 | 2 | 1 | 1 | 2100 | xxxx | xxxx | xxxx | 5000 | 0 | NA | 32 | 0 | 3 |
| 1005628 | 3 | 3 | 2 | 1 | 1 | 2780 | xxxx | xxxx | xxxx | 5000 | 0 | NA | 32 | 0 | 3 |
| 1005628 | 4 | 3 | 2 | 1 | 1 | 3540 | xxxx | xxxx | xxxx | 5000 | 0 | NA | 32 | 0 | 3 |
| 1005628 | 5 | 3 | 2 | 1 | 1 | 2700 | xxxx | xxxx | xxxx | 5000 | 0 | NA | 32 | 0 | 3 |
| 1005628 | 6 | 3 | 2 | 1 | 1 | 3890 | xxxx | xxxx | xxxx | 5000 | 0 | NA | 32 | 0 | 3 |
| 1005628 | 7 | 3 | 2 | 1 | 1 | 2777 | xxxx | xxxx | xxxx | 5000 | 0 | NA | 32 | 0 | 3 |
| 1005628 | 8 | 3 | 2 | 1 | 1 | 3610 | xxxx | xxxx | xxxx | 5000 | 0 | NA | 32 | 0 | 3 |
| 1005628 | 9 | 3 | 2 | 1 | 1 | 3792 | xxxx | xxxx | xxxx | 5000 | 0 | NA | 32 | 0 | 3 |
| 1005628 | 10 | 3 | 2 | 1 | 1 | 3789 | xxxx | xxxx | xxxx | 5000 | 0 | NA | 32 | 0 | 3 |
| 1005628 | 11 | 3 | 2 | 1 | 1 | 3108 | xxxx | xxxx | xxxx | 5000 | 0 | NA | 32 | 0 | 3 |
| 1005628 | 12 | 3 | 2 | 1 | 1 | 3789 | xxxx | xxxx | xxxx | 5000 | 0 | NA | 32 | 0 | 3 |
| 1008996 | 1 | 4 | 2 | 5 | 1 | 12000 | xxxx | xxxx | xxxx | 15000 | 1 | 3500 | 56 | 0 | 6 |
| 1008996 | 2 | 4 | 2 | 5 | 0 | 8990 | xxxx | xxxx | xxxx | 15000 | 1 | 4258 | 56 | 0 | 6 |

\* The Trial ID was a unique, anonymous code created by Westpac for the purpose of this study. No identifying information was shared by Westpac.

Note. The numbers in this table are fictitious. They do not represent actual trial data. Only key variables are shown and xxxx indicates some amount in dollars); wave means the month of data and batch means the week that the individual received the data for that month. There are four batches of messages each month).

Table 6. Data dictionary

|  |  |
| --- | --- |
| Trial ID | Unique anonymous code created by Westpac for the purpose of this study. No identifying information was shared by Westpac. |
| Age | XX |
| Sex | 0=female  1=male |
| Postcode | XXXX |
| Batch | 1=messages sent at week 1  2=messages sent at week 2  3=messages sent at week 3  4=messages sent at week 4 |
| Mode | 1=Email  2=SMS |
| Condition | 1=control (no message)  2=bland message  3=balance-loss frame  4=balance-norms  5=debt-loss frame  6=debt-norms |
| Date SMS/email sent | XX/XX/XXXX (for each message sent) |
| Monthly credit card account status | 0=not active  1=active |
| Annual credit card interest rate at time of bill due date (for each month) | XX.XX% |
| Monthly date when credit card bill is due | XX/XX/XXXX |
| Monthly date when credit card statement is issued | XX/XX/XXXX |
| Monthly credit card closing balance | $balance for each month as per statement, add May to get data before the trial starts? June ’17 to June ’18 |
| Monthly minimum payment due | $min payment due for each month as per statement, May’17 June ‘17 to June ’18 |
| Monthly repayments | $payment (aggregated over the month) received by billing due date each month, May June ’17 to June ’18 |
| Monthly interest charges + fees | $interest + fees applied each month as per statement, May June ’17 to June ‘18 |
| Approved credit card limit | $ and did it change during the trial period? |
| Credit card interest free day terms | 0=45 days (rewards card)  1=55 days (no rewards card) |
| Westpac savings account | 0=no  1=yes |
| Monthly overall savings account balance (not including term deposits) | $balance at the end of each month, June ’17 to June ‘18 |
| Westpac loan (personal or home) | 0=no  1=yes |
| Monthly overall debt owing | $balance for each month as at end of month, May June ’17 to June ’18 |
| Westpac offset account | 0=no  1=yes |
| Westpac redraw account | 0=no  1=yes |
| Redraw account balance | $balance at the end of each month, May June ’17 to June ‘18 |

## Addendum – 2 May 2018

We analysed month 1 data in April 2018, before we received data for the remaining 11 months of the trial. Several steps in our analysis of month 1 data were contingent on initial results, as flagged in our analysis tree. This analysis produced some unexpected results so we have subsequently formed a number of *additional hypotheses* which we will examine when we analyse data for the remaining 11 months of the trial.

1. *There will be differences in treatment effect by channel used: SMS will lead to a greater increase in repayments than email messages. This means hypotheses H1 to H5 (original hypotheses) will be tested separately by channel used.*

We were not originally expecting differences in the effectiveness of messages by channel or that people would differ in their baseline characteristics by channel. However, we did indicate we would present findings for channels separately if there was evidence of a different effect by channel. In month 1, email messages only led to a small, non‑statistically significant increase in repayments while SMS messages increased repayments by $118.

There were also differences in the baseline characteristics by channel used for age distribution and the pre-trial mean payment and mean balance. In addition*,* SMS is a more immediate and direct form of communication than email. So we now hypothesise that some combination of these differences means that SMS will lead to a greater increase in repayments than email messages.

1. According to the Reserve Bank of Australia (RBA)’s 2013 consumer survey 73 per cent of participants reported that they pay off the full balance each month (RBA’s submission to the Senate Inquiry into Matters Relating to Credit Card Interest Rates, 2015) [↑](#footnote-ref-1)
2. This estimate is from the 2016 Credit Cards Market Study by the UK Financial Conduct Authority (FCA). The FCA defined systematic minimum repayment behaviour (persistent revolvers) as customers who make nine or more minimum repayments over 12 months. There are no published Australian estimates of the proportion of credit card consumers who are persistent revolvers and there is no single definition of persistent revolvers in Australia. [↑](#footnote-ref-2)
3. The Treasury (2016). Credit cards: Improving consumer outcomes and enhancing competition. Consultation Paper, Commonwealth of Australia. [↑](#footnote-ref-3)