1) Have any data been collected for this study already?
No, no data have been collected for this study yet.

2) What’s the main question being asked or hypothesis being tested in this study?
I hypothesize that, in an inter-temporal decision task offering a choice between an immediate reward (receive £10 now) and a "larger, later" option (receive £Y in Z days), participants’ expectations about (estimates of) Y will be positively related to the stated value of Z and that their estimates of Z will be positively related to the stated value of Y. I also hypothesize that, when participants are confronted with the choice that they expected (i.e., when their estimated value of Y or Z is used to form the delayed option), the tendency to choose the larger-later option will be negatively related to its delay and positively related to its reward. Finally, I wish to ask whether estimates and choices are related to age and gender. I expect age to be positively related to estimated delay and negatively related to estimated reward; I have no predictions about the link between age and choice, and no predictions regarding gender.

3) Describe the key dependent variable(s) specifying how they will be measured.
Estimated delay (when future reward is specified); estimated reward (when delay is specified); choice of immediate or delayed option when presented with scenario in which their estimate is correct. Estimates will be entered as numeric values in text-boxes; choice will be made by selecting a radio button.

4) How many and which conditions will participants be assigned to?
Two tasks each with 8 conditions. Task 1: Estimate reward given one of 8 different delays (1, 4, 12, 27, 63, 88, 122, 243 days). Task 2: Estimate delay given one of 8 different rewards (11, 13, 15, 18, 23, 29, 38, 54 pounds). Random assignment to task and then to condition by Qualtrics software (with "evenly present elements" option selected).

5) Specify exactly which analyses you will conduct to examine the main question/hypothesis.
["Condition" refers to stated delay or stated reward, depending on task version.] Set alpha to 0.01. Kendall’s tau-b correlation matrix of: condition, estimate, age, gender. Log-transform estimate [as log10(x+1)] and regress (simultaneously) on age, gender, and condition. Repeat with condition coded as a factor and successive difference contrast coding, using F-test to compare full model and model minus condition and reporting t-tests for all coefficients in full model. Repeat both of the foregoing regressions using robust regression via lmrob(setting="KS2014") function from robustbase package for R (now using robust Wald test to compare full model with model minus condition when latter is coded as factor).

Logistic regression of choice on condition, estimate, age, and gender (entered simultaneously). Run 8 analyses by factorially combining (a) coding of condition (continuous or factor, as above), (b) raw estimates vs log-transformed [as log10(x+1)], and (c) conventional vs robust regression (latter implemented via glmrob in robustbase package, with default settings). When condition is a factor, use LRT (for conventional analysis) or robust Wald test (for robust analysis) to compare full model with model minus condition. Report z-tests for all coefficients in all full models.

Repeat analyses including participants who failed attention/comprehension check(s). Repeat analyses using only participants who report not having taken part in previous Psychology studies of inter-temporal choice.

6) Describe exactly how outliers will be defined and handled, and your precise rule(s) for excluding observations.
Exclude negative numeric estimates or non-numeric estimates (although the survey software should block the latter). Robust regression to help deal with/check consequences of outliers (see above). See also "Sample Size" section.

7) How many observations will be collected or what will determine sample size? No need to justify decision, but be precise about exactly how the number will be determined.
On the recruitment platform (prolific.co) I will request 2200 people who are resident in the UK, aged 18+, whose approval rating is 95% or better, who are on a desktop computer, and who have not participated in our previous studies in this series on this platform. (I will initially request 50 people to check the software is working properly and, if it is, recruit the remainder.) At the start of the study the software (Qualtrics) will block people whose ip address is already registered (this system is imperfect). Participants will have to pass a “captcha” before progressing to the experiment. Those who are on a mobile device or who are detected as being outside the UK will be redirected to a page asking them to “return” the job, as will participants who answer “no” to one or more consent questions. I will reject (via the recruitment platform) any submissions from participants who do not provide a full set of responses or who indicate an age of less than 18. Rejected participants will be replaced until the requested sample size is reached. I will then exclude anyone whose ip address has occurred earlier in this study or in this study series (in the case of overlapping or ambiguous time-stamps for duplicate ip addresses, both instances will be excluded). In addition, at the end of the experiment we will ask participants whether this is the first time they have taken the survey or whether they have previously started or completed it; I will only include data from those who self-report that this is their first attempt. The final sample size will be the number of respondents that remain after applying these criteria. In the first set of analyses, I will exclude participants who fail
one or both of 2 attention-check questions. As noted above, I will also run the analyses (a) with those participants included, and (b) using only participants who report not having taken part in previous Psychology studies of inter-temporal choice.

8) Anything else you would like to pre-register? (e.g., secondary analyses, variables collected for exploratory purposes, unusual analyses planned?)

This pre-registration and study supercedes a similar study which contained errors in the software and in the pre-registration document. c.100 participants took part in that study before the errors were detected; their estimates and choice data have not been (and will not be) analysed.