

Mitigating Cognitive Biases in Social Work

Intervention Developer	Cardiff University
Delivery Organisation	Cardiff University
Evaluator	Cardiff University
Principal Investigator	David Wilkins
Protocol Author(s)	David Wilkins and Melissa Meindl
Type of Trial	Lab-In-The-Field RCT
Age or Status of Participants	Social workers and social work students in England - all aged 18+
Number of Participating Local Authorities	N/A
Number of Children and Families	N/A
Primary Outcome(s)	Brier scores (accuracy of forecasts)
Secondary Outcome(s)	Extent of confirmation bias
Contextual Factors	Professional and personal characteristics of participants

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Background and Problem Statement

Social workers make potentially life-changing decisions every day. Many of these decisions involve implicit or explicit predictions about the future. For example, that a case can be safely closed, and the child will not be re-referred within the next few days or weeks. Or that a child will not be safe from significant harm if they remain at home. Or, more prosaically, that a parent or child will respond better to a particular intervention than they would to a different one.

Yet in general terms, people are very poor at predicting the future. In part, these difficulties are caused by our susceptibility to cognitive bias. A recent review of the literature ([Featherston et al 2019](#)) found that there are currently no well-evidenced interventions to help mitigate the effects of cognitive bias in social work.

Nevertheless, there are some reasons to be optimistic. In other fields, such as politics and economics, various interventions have been developed (by The Good Judgement Project) which can significantly improve forecasting abilities. Many of these interventions work by mitigating cognitive bias and supporting the quality of group-based decision-making. In a previous randomised controlled trial (RCT) with social workers ([Wilkins et al 2020](#)), we found that a very brief online intervention aimed at mitigating confirmation bias had a small positive effect on forecasting abilities (~12% improvement).

In this study, we want to explore this further by testing a more in-depth intervention and measuring what difference it makes in relation to i) forecasting abilities and ii) a direct measure of confirmation bias.

Intervention and Theory of Change

We used a survey of social workers and social work experts to ask about the prevalence of cognitive biases in social work practice. We then completed a brief review of the literature and identified four interventions that had existing evidence of effect in relation to the most commonly perceived biases in social work (namely authority bias, blind-spot bias and confirmation bias).

These four interventions were piloted with a small group of social workers and social work experts. Nineteen participants signed up to the pilot, 16 tested the interventions, and nine completed the pilot. Two potential interventions were identified using feedback from the pilot, however, one of the interventions required participants to attend a training centre, which is not practicable due to Covid-19 restrictions. As a result, only one intervention was selected and then further developed for the purposes of this trial – Checklists (see [Gawande 2011](#)). Checklists are a form of intervention used in various fields to help decision-makers reflect on what they are doing, and to help ensure that key stages or elements within the decision-making process are not over-looked. There are many possible types of checklists that can be used, depending on the nature of the decisions and the context in which they are made.

For this RCT, our Checklist intervention will involve reading a case study and answering questions about risks and possible next steps. At the end of the case study, participants will be asked to decide what should happen next and use a checklist to help guide their thinking.

The theory of change is that while decisions in complex fields such as social work should be based on professional judgement, the Checklists intervention can help ensure that important elements within the decision-making process are not overlooked. By asking participants to work through the checklist before submitting their final responses to the case study, they will be able to reflect on their judgements, consider a wider range of options and avoid confirmation bias.

Research Questions

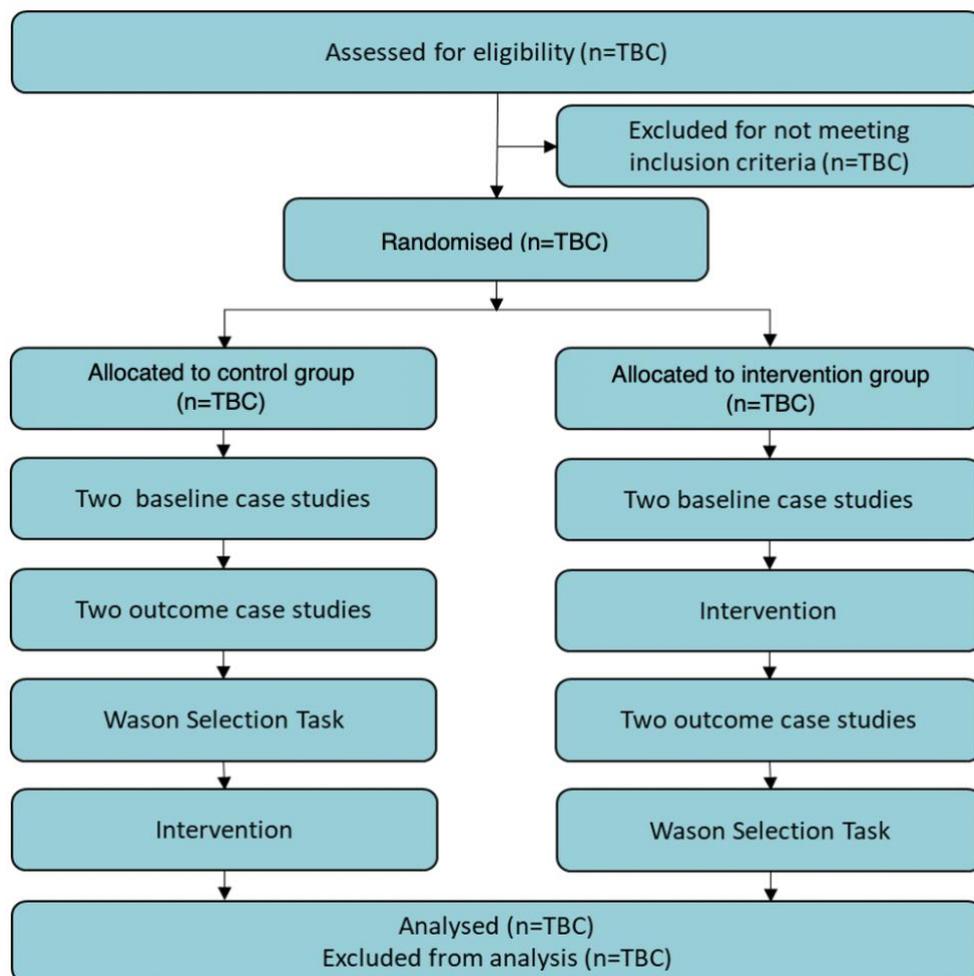
Primary Research Questions

1. What is the impact of the checklist intervention on forecasting accuracy amongst social workers?
2. What is the impact of the checklist intervention on confirmation bias amongst social workers?

Exploratory Research Questions

3. Is there a relationship between social workers' forecasting accuracy and their level of confirmation bias?
4. Is there a relationship between social workers' forecasting accuracy and i) age-group, ii) gender, and iii) length of post-qualifying experience?

Design Overview



Trial type and number of arms		Randomised controlled trial with two arms (one intervention and one control group) and two outcome measures (one pre- and post-and one cross-over)
Unit of randomisation		Individual social workers
Primary outcome	Variable	Accuracy of forecasts
	Measure (instrument, scale)	Brier scores
Secondary outcome(s)	Variable(s)	Extent of confirmation bias
	Measure (instrument, scale)	Wason Selection Task

Participants

Inclusion Criteria

All registered social workers working for Local Authorities in England are eligible to take part. Student social workers currently registered on social work qualifying programmes in England are also eligible to take part.

Exclusion Criteria

The case studies used in this RCT (as part of the measurement of forecasting accuracy) have been used in two previous studies. There is a chance that participants in this RCT will have taken part in previous studies and seen the same case studies before. If so, their familiarity with them may influence their predictive accuracy. We will ask participants to say if they have taken part in previous studies, and if so, we may exclude their data from the final analysis (if having taken part previously is associated with significantly better or worse performance).

Recruitment Plan

The study will be advertised using the What Works for Social Care website and social media platforms where social workers will be asked to volunteer to take part. We will also approach partner Local Authorities and other social work organisations in England (e.g. Frontline) and ask them to help publicise the study. We will also publicise the study via Cardiff University and/or CASCADE research centre social media platforms.

Randomisation Process

Participants will be allocated to either a control group or an intervention group. Checklists will be delivered online using Qualtrics, which will also be used to randomly assign participants to the control or intervention condition. This will be achieved using the 'randomiser' function, set to 'evenly present elements', to ensure equal numbers are allocated to each group. The randomisation process will be recorded by Qualtrics and will form part of the data output from the completed surveys. Analysts will be blinded to group allocation.

Sample Size and Calculation/Estimation

A power analysis was conducted using G*Power to estimate the necessary sample size. Based on these calculations, a total sample of 157 participants is required to detect a small to moderate effect size ($f^2=0.085$) in a multiple regression (see G*Power output below). Checklists have not been previously used as an intervention in social work research and as such it is difficult to estimate the effect size we can expect to see for this intervention. A small to moderate effect size was chosen for this RCT as our previous RCT indicated that other cognitive debiasing interventions had a small effect on forecasting accuracy, and accounting for a smaller effect size will enable us to be powered and have a large enough sample to detect an effect even if it is small.

To account for a drop-out rate and inadequate completion of the study (estimated at 20%), we will aim to recruit approximately 195 participants.

MDES	0.085
Alpha	0.05
Power	0.8
Number of Predictors	5
Estimated Required Sample Size	157

Outcome Measures

Our primary outcome measure is the accuracy of predictions made in relation to two case studies, using Brier scores. Two baseline case studies will be completed by participants in both groups at the start of the trial. Participants in the control group will then complete the two outcome case studies before accessing the intervention, while participants in the intervention group will do so after seeing the intervention.

In relation to each case study, participants will answer four questions and rate the likelihood of different outcomes on a scale from zero to one hundred (where zero means definitely will not happen and one hundred means definitely will happen).

The primary analysis will involve the calculation of Brier scores for each individual using the following formula:

$$(1 - x)^2 + (0 - y)^2 = z$$

Where x = the forecast for the outcome that occurs and y = the forecast for the outcome that does not occur. The Brier scores from the baseline case studies will be averaged together to provide a pre-intervention score. The Brier scores from the second set of case studies (for the intervention group, seen after the intervention) will be averaged together to provide an outcome score.

Possible Brier scores range between 0 and 1 where a score of 0 represents perfect accuracy and a score of 2 represents perfect inaccuracy.

We will use the Wason Selection Task to measure the prevalence of confirmation bias in both groups. The Wason Selection Task consists of four cards and a conditional rule, such as “if a card has a circle on one side, then it has the colour yellow on the other side”. Only one side of each of the four cards is shown, and the task is to identify the cards that need to be turned over to determine whether the rule is valid. The task serves as a test of confirmation bias by measuring whether participants turn over the cards that could confirm or disconfirm the rule.

Wason Selection Task scores will be calculated by scoring participants +1 point for each disconfirming (correct) response, and -1 for each confirming (incorrect) response. Participants will be asked three questions, with four possible responses for each one (two correct disconfirming, and two incorrect confirming). This means that possible scores will range from -6 to +6. Higher scores indicate lower cognitive bias, and vice versa.

The Wason Selection Task will be administered in a cross-over design, by asking the control group to complete the task before being shown the intervention and after the outcome case studies, and the intervention group to complete the task after being shown the intervention and after the outcome case studies.

Analysis Plan

To answer Research Question 1, Brier scores at endline will be regressed on treatment allocation, baseline Brier scores and covariates. The treatment effect will be taken as the coefficient on the treatment allocation dummy. We take the effect as statistically significant if the p-value on the coefficient is less than 0.05.

To answer Research Question 2, scores from the Wason Selection Tasks will be regressed on treatment allocation and covariates. The treatment effect will be taken as the coefficient on the treatment allocation dummy. We will take the effect as statistically significant if the p-value on the coefficient is less than 0.05.

Covariates will be:

- i) age-group (18-24, 25-34, 35-44, 45-54, 55-64, 65-74, 75 or older)
- ii) gender (male, female, non-binary, other)
- iii) length of post-qualifying experience (N/A - I am not yet qualified, between 1 and 12 months, between 1 and 3 years, between 4 to 6 years, between 7 to 9 years, 10 or more years).

To address Research Question 3, the Pearson's correlation between Brier scores and Wason Selection Task scores will be estimated. The relationship is taken to be significant if the p-value is less than 0.05.

To address Research Question 4, we will report the coefficients and their p-values from the regression answering Research Question 1.

To determine if participants who previously took part in our decision-making studies perform significantly better/worse than other participants, an independent samples t-test will be used to compare previous participants' mean Brier scores with the overall mean Brier score for other participants in the study. If the null hypothesis of no difference is rejected at the 0.05 significance level, we exclude the previous participants.

Ethics & Participation

Ethical approval has been obtained from the ethics committee of the School of Social Sciences, Cardiff University.

Qualtrics will display an electronic information sheet at the beginning of the study and participants will be offered the chance to ask questions by contacting the research team via email or telephone.

As part of the pre-test survey, participants will be asked to give consent before taking part and will be unable to proceed with the survey unless consent is provided. The consent form will make clear that participation is voluntary. If any participants decline consent, they will be exited from the survey at that point.

Participants will also be informed of their right to withdraw from the study, without having to give a reason. Participants will be able to exit the study at any point by simply closing their browser window. Any data collected before the participant exits the survey will be included in the study – participants will be informed of this as part of the consent form.

Participants who complete the study will be given a digital Love2shop gift voucher (£10) to thank them for taking part.

Registration

The protocol was registered with Open Science Framework (osf.io) on 4th December 2020 - <https://osf.io/57b84>.

Data Management and Protection

Data Collection

We will only collect and process data in order to address our research questions. Participants will be asked to provide their email address for the purpose of sending out thank you gift vouchers and to allow us to contact them for future studies (if they opt in). Participants can choose not to provide us with their email, and in instances where they do, participants' emails will not be linked with any data they provide as all participants will be allocated an anonymous participant identifier.

In all circumstances, the identities of individuals taking part in the study and the data they provide will be kept confidential and will only be used for research purposes. Participants will be informed of their right not to take part in the study, either by not consenting to take part at all or by exiting the survey at any point they so choose. Participants will be informed that if they choose to withdraw before completing the study, any data shared up until that point may still be included.

Data will be processed only when the data subject has given consent to the processing of his or her personal data for the specific purpose of conducting this trial.

Data Storage

Procedures for data storage, processing and management will comply with the Data Protection Act 1998. All participants will be allocated a unique identifier and all data collected will be held in a linked anonymised form.

More information on the management and protection of participants data can be found in Cardiff University's Research Participants Data Protection Notice. Participants will be provided with a link to the Data Protection Notice in the information sheet at the beginning of the study:

<https://www.cardiff.ac.uk/public-information/policies-and-procedures/data-protection/research-participants-data-protection-notice>

Personnel

- David Wilkins, Principal Investigator, Cardiff University
- Melissa Meindl, Co-investigator, Research Assistant, Cardiff University

Timeline

Dates	Activity	Staff responsible/ leading
October 2020	Confirmation of experimental design and ethics application	David and Melissa
October/November 2020	Completion of study materials	David and Melissa
December 2020	Recruitment of participants	Melissa
December 2020/ January 2021	Collection of data	Melissa
February 2021	Analysis of data	Melissa
March 2021	Final report	David and Melissa