Timing the Engagement with the Mindsets of Cash Transfer Recipients:

Analysis Plan for Cognitive Outcomes

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Note: This analysis plan overrides all previous versions.

RATIONALE

Scarcity in financial resources appears to tax the cognitive performance of the poor, and there are indications that cash inflows can cause cognitive boosts (Mani, Mullainathan, Shafir, & Zhao, 2013). This suggests that cash transfers can have an enabling effect on tasks that demand cognitive resources. For example, as cognitive load impedes schema adoption (Sweller, 2013), cash transfer interventions may enhance the effectiveness of psychological interventions aimed at altering schematic cognitions. This suggests (perhaps counterintuitively) that when the two interventions are bundled, cash transfers should lead rather than trail psychological interventions. More generally, if bundling of the two interventions leads to synergies, the short-term cognitive impacts of cash transfers may be one explanation.

EXPERIMENTAL CONTEXT

The trial "Promoting Future Orientation Among Cash Transfer Recipients" (see identifier #996 on the social science registry of the American Economic Association) combines a cash transfer intervention with a 'mindset' intervention aimed at altering the constellation of people's schematic cognitions about their own capacity and future. This provides an opportunity for a sub-trial that randomly assigns the timing of mindset

engagement relative to cash transfers and evaluates if the bundled intervention is in fact more effective when it leads rather than trails.

DATA

Sample

Participants whose villages had been (for the purposes of the "main" trial) assigned into that arm which involves both cash transfers and the psychologically active ("mindset") intervention were further randomized at the individual level to either be candidates for receiving the mindset intervention in the weeks before or in the weeks after the transfer in question. (Note: The cash transfer provider GiveDirectly makes three transfers labeled Token, Lump Sum A, and Lump Sum B in approximately two-month intervals. The transfer in question is currently defined as Lump Sum A). The individual-level randomization was stratified on the respondent's per capita housing space relative to the village median; widow status; and secondary educational attainment. The final sample analyzed for the sub-study will be restricted to participants who, in addition to having been randomized into one of the sub-arms, have the following attributes:

(1) Successfully baselined; and

(2) Received the transfer in question in that month in which GiveDirectly first made the transfer in question in the same village; and

(3) Received the mindset intervention within 72 hours of the first participant who received the mindset intervention in the same village and sub-arm.

Note that implementation challenges may have caused a potentially large number of participants to become slated for exclusion by criteria (2) and (3). After an initial analysis of implementation patterns, an amended sample may be formed. If so, results for this amended sample would be shown alongside the original sample described above.

Outcomes and Their Operationalization

For the purpose of this analysis, three cognitive measures will serve as outcomes:

(1) Digit Span (Working Memory). Where no response is correct, scored as zero. Otherwise scored as the length of the longest sequence that respondents can correctly recall, minus two points.

(2) Raven's Matrices (Fluid Intelligence). Scored as the number of correct responses provided within the time limit.

(3) Numerical Stroop (Cognitive Control). Scored as the number of correct responses provided within the time limit.

Data Source

All outcomes discussed here have been collected in the form of a survey conducted immediately preceding the mindset intervention. Data sources for covariates include the census, the baseline, and the randomization output.

EMPIRICAL STRATEGY

Model Specification

The following model will be estimated:

$$y_{ij} = \alpha_j + \beta A_{ij} + \delta X_{ij} + \varepsilon_{ij}$$

Here y_{ij} is the outcome of interest for individual i in village j; α_j is a village fixed effect; A_{ij} is the randomized assignment, coded to 0 (to 1) among participants who are intended to receive the cognitive test and the psychological intervention before (after) Lump Sum A; β estimates the impact of intended assignment to the 'after' condition; X_{ij} is a vector of socioeconomic covariates comprised of the respondent's

age, the corresponding household's per capita housing space, and secondary educational attainment (a binary variable); δ is a vector of associated coefficients; and ε_{ij} is an idiosyncratic error term.

Hypothesis

The null hypothesis is that β=0. Based on the aforementioned rationale, I expect that $\beta > 0$.

Adjustments

Observations will be dropped where cognitive measures fall outside of the range of values allowed by the test protocol. No further adjustments are currently envisioned for the main outcomes. Any procedures for adjusting missing or outlier values in the covariates will follow those of the main study.

Robustness Checks

In addition to the above, I will estimate a specification without socioeconomic covariates, and one substituting X_{ij} for a vector of three socioeconomic covariates selected using the least angle regression algorithm by Efron et al. (2004). I will also estimate a specification replacing village fixed effects with stratum fixed effects. Further, I will test the sharp null hypothesis using randomization inference (random number seed 98765; 10,000 simulations).

Aggregation

In addition to the outcomes described above, I will estimate effects on a cognitive index aggregated from the three individual outcomes using the methodology presented by Kling, Liebman, & Katz (2007). If the aggregate index is not significant, the analysis of individual outcomes will control for the false discovery rate, following Benjamini & Hochberg (1995) and Anderson (2008).