<h1 style="text-align:center">Hybrid Pre-Analysis Plan 1</h1>

1.   Background and hypotheses

While economic empowerment programs often target women as beneficiaries, they don't necessarily lead to more productive income-generating activities for low-income women, especially compared to men (De Mel, McKenzie, & Woodruff, 2009). Research suggests that this result is not necessarily due to deficits in information or skills, which are provided commonly through business skills trainings, often the main focus of business skills trainings, but rather to motivational and psychosocial barriers such as gender norms and lack of access to local leaders and role models (Campos et al., 2017; Field et al., 2016; Macours & Vakis, 2014; McKenzie & Woodruff, 2013). In this study, we test different psychosocial approaches to engaging women in an economic empowerment program as well as measure the effects of these approaches on women's psychological, social, and economic measures.

In a lab-in-the-field experiment in Niger, we test two different psychosocial approaches to motivating women's economic engagement – one using a role model with a "personal initiative" approach to entrepreneurism and the other with an "interpersonal initiative" approach. A recent paper by Campos et al. (2017) found that a "personal initiative" training for self-selected small business owners in Togo led to improved business outcomes compared to information-based business skills training. This type of psychologically-informed training is grounded in an independent, more Western view of the self, that is driven to maintain distinction from others, influence others, and develop and express personal preferences and internal attributes (Markus & Conner, 2013). This type of training appears effective for self-identified entrepreneurs, and, indeed, many behaviors necessary for entrepreneurial success are the same as those normatively practiced in market-based, Western, Educated, Industrialized, Rich, and Democratic (W.E.I.R.D.) settings (Henrich, Heine, & Norenzayan, 2010).

However, many women living in extreme poverty in rural West African regions face highly restrictive gender norms around economic activities and extreme economic scarcity. Most Nigerien women experience restrictions on their geographic mobility, their control over finances, and their decision-making over economic activities. Based on qualitative data, country-level characteristics, and existing (though limited) research, we would consider Niger a "tight" culture; tight cultures are characterized by low tolerance of norm deviance and more traditional, binding values and often occur in contexts of economic scarcity (Markus & Conner, 2013; Gelfand et al., 2011; Markus & Kitayama, 1991). Niger is one of the lowest income countries globally, has a highly religious, Muslim, population, and strong gender norms. In such economically and socially constrained contexts, people tend to have a more relational view of self. They tend to see themselves as connected and interdependent with others and to show a style of agency that emphasizes referencing others, maintaining ties, and adjusting to others.

While more independent, entrepreneurial ways of acting may be desirable in some situations, they may not be culturally resonant or practical for women to exert in economically and socially constrained contexts. Indeed, while motivational interventions emphasizing independent initiative and personal goal setting do drive educational achievement in the United States, they fail to affect achievement outcomes in resource-constrained societies with more traditional values including in China and India (Kizilcec & Cohen, 2017). In interdependent contexts, effective behavior change

interventions may instead focus on interpersonal processes such as capitalizing on social norms or enabling individuals to meet interpersonal obligations (Eom et al. 2016; Markus, 2016). For example, Field et al. (2015) finds that women who are asked to bring a friend to a business counseling training report higher business activity and household income.

In this study, we compare these two psychological intervention approaches to addressing women's economic agency in Niger. The first is grounded in independent agency, reflected in the "personal initiative" approach, and the second in interdependent agency, reflected in the "interpersonal initiative" approach. These interventions make salient differing interpretations of Amina's story through short videos and guide participants through related reflection exercises. We examine the effects of these two different "salience" interventions on economic decisions and psychosocial outcomes and assess their relation to social and economic constraint through a lab-in-the-field experiment.

Based on our preliminary qualitative research and literature review as well as our own work in other low-income sub-Saharan African settings, we predict that this population will exhibit, particularly in a lab setting, both elements of independent, personal agency and interdependent, interpersonal agency, but will have contexts affording more interdependent ways of being. We propose that seeing female role models in films who demonstrate independent, "personal initiative" or who demonstrate interdependent, "interpersonal initiative" will have similar motivational effects on viewers' economic engagement, aspirations, and sense of self-efficacy. They will both be desirable and motivating models of economic behavior. However, we propose that the "interpersonal initiative" condition will more effectively buffer women, especially those in more restrictive settings, from negative interpersonal consequences (e.g. sense of shame, selfishness, scorn) that they anticipate to occur as they challenge traditional economic gender norms. In addition, the "interpersonal initiative" condition may more effectively boost measures of interpersonal efficacy and trust, and contributions to collective projects. Through this study, we aim to add "interpretive power" to the mechanisms underlying women's economic engagement in the ASP program and economic activity more broadly (Brady, Fryberg, & Shoda, 2018).

This study is novel and highly exploratory in several regards. In terms of the interventions, while brief psychological "wise" interventions have been developed for and extensively tested on Western settings (Walton & Wilson, 2018), few attempts have been made to adapt brief motivational interventions developed in Western settings for more interdependent cultures, particularly not for sub-Saharan African countries (Medin, 2017). We directly compare an intervention derived from Western selfways ("personal initiative") with a culturally-adapted intervention ("interpersonal initiative"). In terms of the population, no psychological experiments beyond the present studies, to our knowledge, have been conducted with low-income women living in remote regions of Niger, and none with the aim of boosting poverty alleviation efforts, beyond the ASP program. We conduct a lab-in-the-field experiment with safety net participants in order to examine the psychosocial mechanisms of women's engagement in economic activity, as encouraged by the adaptive safety net (ASP) program, and in relation to their social and economic constraints. Lastly, self-report psychological measures of attitudes and beliefs developed and validated in Western contexts have not been found reliable in these contexts (Laajaj & Macours, 2017), likely due to differences in cognitive thinking styles (Nisbett et al., 2001), among other factors. Instead of relying on analytical, decontextualized self-report cognitive measures that were developed for formally educated populations in the West, we test more contextualized measures. For example, we assess behavioral, affective, and cognitive reactions to vignettes of common economic decisions and ask for predictions of others' behaviors and reactions in specific scenarios. In these ways, this study seeks

to break new ground in culturally-informed psychological research in West Africa, in this case in the context of determining effective means for economically empowering women living in extreme poverty.

In terms of experimental effects, this study aims to contribute evidence, first, on whether brief media-based psychosocial interventions increase women's engagement in an economic empowerment, safety net program. Second, it aims to compare the effects of media-based portrayals of women's economic agency being grounded in "personal initiative" or "interpersonal initiative" on economic behaviors, psychological outcomes, and interpersonal processes, and to determine the extent to which these effects are dependent on women's social and economic constraints and value orientations.

In this novel intervention space and understudied population, our predictions are largely exploratory, with the goal of generating insights on low-income women's economic agency and motivation in rural Niger. We are registering our analysis strategy to limit researcher degrees of freedom and to ensure we can draw reliable inferences from our data. In this document, we detail a hybrid pre-analysis strategy (Anderson & Magruder, 2017) in which we register a main behavioral outcome (administrative data on skills training participation) and detail our approach for analyzing the outcomes taken in the lab-in-the-field experiment.

2.   Experimental Design

1. Embedded lab-in-the-field study design and timing

This lab-in-the-field study explores the psychosocial mechanisms of motivating women's engagement in economic development activities in Niger. It is embedded within a larger study of the Niger Adaptive Safety Net Program (ASP) offering small, regular cash transfers and a set of productive accompanying measures to low-income households. The package of productive accompanying measures include several components (described in details here: https://www.socialscienceregistry.org/trials/2544), which are being evaluated as part of a multi-country study. Beneficiaries are organized in a group as they participate in most of these components, for instance for training in business skills or life skills and for savings. For this study, we focus on a subsample of female participants in villages where beneficiaries were offered psycho-social interventions. Individuals were eligible for participation in the ASP program on the basis of a Proxy Means Targeting (PMT) score and other methods seeking to identify poor and vulnerable households (selection process detailed here: http://documents.worldbank.org/curated/en/387791524060631076/pdf/WPS8412.pdf). 85% of ASP beneficiaries were found to fall below Niger's national poverty line.

Among other components, ASP beneficiaries participate a community-wide sensitization session, consisting of a 20-minute film and subsequent discussion, and twelve sessions of business and life skills trainings. This lab-in-the-field embedded study takes place between the sensitization session and the business and life skills trainings. It links to both of these components in that the study compares the effects of particular features of the film shown in the sensitization session, and a behavioral outcome of the study is the rate of participation in the business and life skills trainings.

The film shown in the sensitization session is developed for the rural, predominantly Muslim ASP program population in Niger. It depicts the journey of a role model, an entrepreneurial woman named Amina, who works and negotiates with her family to start her own business and, in this

process, shares her knowledge and example with her community and her children. The film is a launching point for a wider community discussion on adaptations to business practices and to the roles of men and women in the face of a changing climate. One to two months after the sensitization, female beneficiaries participate in group-based trainings on business and life skills that are intended to give them the business knowledge and psychosocial skills to create, build, or expand their economic activities and to achieve greater income-generating capacity.

This embedded lab-in-the-field study is conducted in the weeks between the sensitization session and the business and life skills trainings with a subsample of female participants in six communes of Niger. It tests the motivational effects of two different types of role models by making salient different elements of Amina's story. The first presents Amina as a woman who takes "personal initiative" by being proactive, strategic, and innovative in her pursuit to build her business. The second presents Amina as a woman who takes "interpersonal initiative" by collaborating with her family and teaching others new skills in the course of building her business. We assess how these two narratives and accompanying reflection exercises (i.e. "salience interventions", further described below) affect economic engagement behaviors, economic decision making, self-construals, and interpersonal processes.

2. Sampling design and power calculation
We conduct the study in 33 villages receiving the psychosocial interventions as part of the ASP program in the six communes. Our study includes 2,628 beneficiaries in these villages.

First, groups of beneficiaries are randomized to have a saturation level of 25, 50, or 75 percent of the group treated with a psychosocial intervention:
   1. 25 percent of the group treated (n= 36/108 groups)
   2. 50 percent of the group treated (n= 36/108 groups)
   3. 75 percent of the group treated (n= 36/108 groups)

Overall, 1,332 participants are randomized to the treatment (a psychosocial intervention in a lab-in-the-field session) and 1,296 to the non-treated control group. These groups, which participate in business and life skills trainings together, have between 11 to 33 participants, with an average of 25.

Within each group, individuals assigned to treatment are further randomized to one of two brief psychosocial "salience" treatments, delivered in the lab-in-the-field session:
   a. "Personal initiative" intervention (n= 666/1,332 participants)
   b. "Interpersonal initiative" intervention (n= 666/1,332 participants)

These randomizations are stratified by timing of the ASP training activities (Early: February-March / Late: April), the ASP treatment arm (Complete: all components / Social: all except cash transfer), and participation in a prior ASP baseline survey (Y/N).

Sample size requirements were computed prior to sampling and randomization. The desired minimum detectable effect (MDE) sizes between the two lab-in-the-field salience interventions ("personal initiative" and "interpersonal initiative") was a Cohen's d of 0.16 and between the psychosocial treatment (pooled) and the control group was a Cohen's d of 0.11. This target MDE requires n=614 for each of the two salience treatment intervention arms and n=1,296 for the control (no lab-in-the-field survey) arm. Assuming a rate of 8% for non-participation, survey error, and

attrition for the two lab-in-the-field arms, our sample size for the lab-in-the-field study sample was n=1,332.

3. Intervention

During the individual-level lab-in-the-field session, participants are guided by female enumerators through one of the two salience interventions and then are asked a series of psychosocial and socioeconomic measures. These lab-in-the-field sessions, lasting approximately 80 minutes, take place in a private space in the participant's home and all materials are read aloud in the participant's desired language (Haoussa, Djerma, or Tamachek). Tablets are used to display media and collect data. Visual aids, including a ladder, play money, and drawings of groups of 1-10 women, are used for selected measures.

The "salience" interventions make salient one of two different interpretations of the film of Amina through a four-minute video recap of Amina's story and a 20-minute reflection exercise relating the role model's story to their own economic goals and behaviors. In the first "personal initiative" condition, participants see a recap of the video that portrays the main character as being initiative-taking, strategic, and innovative; they are then led through mental contrasting and implementation intentions focusing on intrapersonal and structural resources and barriers. This intervention approach is evidence-based in Western populations (Duckworth et al., 2013, Kizilcec & Cohen, 2017). In the second "interpersonal initiative" condition, participants see a recap of the video portraying the main character as being respectful, dutiful, and generous; they are then led through a goal setting exercise focusing on interpersonal resources and barriers. This second condition is a motivational intervention, adapted from the mental contrasting and implementation intentions approach, to meet local cultural values as well as the interpersonal barriers faced by Nigerien rural women to economic activity. The economic activity and trajectory of Amina are consistent across the two videos.

4. Outcomes

For the group-level randomized treatment (saturation level of psychosocial treatment within group), the outcomes of interest are rates of participation in the 12 sessions of business and life skills. These skill training participation rates are captured through administrative data collection processes. These trainings begin within 1 week of the lab-in-the-field study.

For the individual level randomization to one of the two salience intervention treatments ("personal initiative" or "interpersonal initiative"), the outcomes of interest are the intermediate psychological, social, and economic measures collected in the lab-in-the-field session. These measures are taken, in the lab-in-the-field session, immediately after showing respondents the video recap and guiding them through the associated reflection exercise. Enumerators ask respondents a series of psychological, social, and economic measures, including hypothetical economic engagement behaviors (including hypothetical decisions to engage in economic activities, investment in activities), self-oriented measures items (including personal efficacy, confidence, economic aspirations), other-focused items (including interpersonal strain, interpersonal efficacy and trust, gender norms, investment in community funds), and assessment of role model Amina and self (social, economic, moral statuses). Enumerators also record participants' qualitative responses to the intervention, to be analyzed as manipulation checks. In addition, we collect other measures to be assessed as moderators, or dimensions of heterogeneity, including the extent of economic constraint (e.g. poverty score, financial dependence on others, cell phone ownership, education level), social constraint (e.g. marital status, social influence), and values orientation (binding and traditional versus individualizing and self-expressive).

3.   Empirical Analysis

This study tests novel intervention strategies and also has as a primary goal to better understand the cultural orientations of this population, the economic and social constraints they face, and the ways in which these contextual factors influence economic behavior and psychosocial processes. To maximally learn about the psychosocial processes and behavioral consequences of women's economic engagement, this study has multiple measurement methods.

First, the lab-in-the-field survey measures enable a fine-grained assessment of personal and interpersonal processes caused by the "personal initiative" vs "interpersonal initiative" conditions and the moderation of these effects by psychosocial, cultural, and economic factors. For these outcomes, we register a split sample analysis approach in Part 1 below.

Second, an examination of these processes will in turn inform the broader psychosocial mechanisms – barriers and facilitators – for women's later economic and psychological outcomes. As one indicator of women's economic engagement, we assess their participation in business and life skills trainings offered to them. The analytic strategy for analyzing the administrative skills training participation data is specified in Part 2 below.

In addition to the analyses of the experimental outcomes registered below, we will also analyze, in an exploratory manner, descriptive data we collected. In particular, we conducted in-depth interviews with over 20 women prior to the study and 9 same-gender focus groups with over 90 men and women total. We also collected several transcripts of community-level discussions in the mobilization session following the original viewing of Amina's story. Lastly, we have embedded several descriptive survey measures into the lab-in-the-field survey to better understand the value orientations and social and economic situations of the study population. These sources of data will provide rich, contextual information to ground our quantitative findings.

Part 1: Registered approach for the exploratory part of a split-sample analysis of impact on lab-in-the-field psychosocial measures

A) Analysis strategy

Due to this study's exploratory nature, we will split the lab-in-the-field study outcome measures into two separate datasets, the first for exploratory analyses and the second for confirmatory analyses. In addition to allowing us to conduct sequential and cumulative science, this split sample approach will help control the rate of false discovery (Anderson & Magruder, 2017). In this split sample approach, we will randomly sample 35% of the entire dataset for our exploratory analyses. These analyses will inform a second pre-analysis plan of confirmatory tests for the 65% remaining of the dataset. We will thus take n=446, or 35% of the 1,276 participants surveyed in the lab-in-the-field experiment. We will reserve the other n=830 participants for the confirmatory sample. This split will allow for a minimum detectable effect size of a Cohen's d= 0.236, given a significance level of .1 for a two-sided test, in the exploratory sample, and a Cohen's d=0.173, given a significance level of .05 for a one-sided test, and a Cohen's d=0.194, given a significance level of .05 for a two-sided test, in the confirmatory sample.

We will stratify the random selection of the exploratory and confirmatory datasets using the same variables which are used for stratified random sampling of the lab-in-the-field study: timing of the

ASP training activities (Early: February-March / Late: April), participation in the ASP baseline survey (Y/N), saturation level of treatment within beneficiary groups (25/50/75 percent of group treated with either lab-in-the-field intervention) plus the psychosocial treatment condition ("personal initiative" / "interpersonal initiative").

In the exploratory dataset, we will primarily be exploring the properties of the measures and generating hypotheses on the directions of effects, particularly across different dimensions of heterogeneity. First, we will assess construct validity of the measures based on factor structures and correlations with other measures. In addition, we will examine related qualitative responses to better understand how the measures were interpreted. We will assess the variability in our measures. For example, if certain composite variables have minimal variation (e.g. 90% of observations have the same value), they may be omitted from analysis of treatment effects and moderation.

Second, we will assess the probabilities of different hypotheses being true. We will do this through traditional null hypothesis significance testing methods and, for robustness, we may use Bayesian analysis methods. In these processes and in combination with analysis of other recent datasets, we will furthermore assess how central certain measures are to the theory – which hypotheses should be primary versus secondary and which moderators might identify the boundary effects of the theory.

Based on these processes, we will register a second pre-analysis plan that will detail our confirmatory analyses.

B) Outcomes

We take immediate measures following the delivery of one of the two "salience" interventions in the lab-in-the-field study. We have four main sets of outcomes:

1. Economic engagement behaviors (including hypothetical decisions to engage in economic activities, investment in activities)
2. Self-focused items (including personal efficacy, confidence, economic aspirations)
3. Other-focused items (including interpersonal strain, interpersonal efficacy and trust, gender norms, investment in community funds)
4. Assessment of role model Amina and self (social, economic, moral statuses)

We have both qualitative and quantitative manipulation checks of the interventions, which include participants open-ended responses to the intervention prompts.

In order to assess moderation, or heterogenous treatment effects, we primarily will assess the extent of economic constraint (e.g. poverty score, financial dependence on others, cell phone ownership, formal education), social constraint (e.g. marital status, social influence), and oriented values orientation (e.g. binding/traditional vs. individualizing/self-expressive).

C) Hypotheses

Through this study, we aim to contribute to theory on culturally-specific styles of motivation and norm shifting strategies by comparing the effects of psychological interventions that tap into Western, more independent values and selfways (e.g. valuing independence, taking personal initiative) versus local, more interdependent values and selfways (e.g. valuing respect of authority,

enacting Islamic value of peace). While more independent values and selfways may be more resonant for women with greater economic and social independence, interdependent values and self-ways may be both more resonant and pragmatic for women who experience greater economic and social constraint (Gelfand et al., 2011, Markus & Conner, 2013).

First, we hypothesize that both psychological interventions, which engage women in thinking about a future with greater financial security and freedom, will have similar effects on economic engagement measures and self-related beliefs. In this sense, we propose that both "initiative" conditions motivate women psychologically. The narrative of freedom from constraint portrayed in the "personal initiative" condition may, in fact, more strongly motivate some economic behaviors than the "interpersonal initiative" condition, particularly for women who are freer from economic and social constraint and who would be able to enact independent agency.

Second, we hypothesize that, particularly for women who are more economically and socially constrained and who have more binding, group-oriented values, the "interpersonal initiative" condition will improve outcomes on other-focused measures, such as mitigating interpersonal strain and conflict and improving interpersonal efficacy.

Third, we propose that there may be personal versus interpersonal tradeoffs in the allocation of a hypothetical budget, such that the "personal initiative" condition will encourage greater investment in one's economic activity and less to community funds, compared to the "interpersonal initiative" condition. This effect may be stronger for those with a more independent/self-expressive than interdependent/traditional value orientation and less social constraint.

Ultimately, we are interested to explore and compare the extent to which individual motivation (Hypothesis 1) and interpersonal processes (Hypothesis 2) influence women's real-world economic behaviors and outcomes, according to their degree of economic and social constraint and value orientations.

Finally, we would like to acknowledge that in our theoretical orientation, we use a difference framework, not a deficiency framework. We do not position "personal initiative" and self-expressive values or "interpersonal initiative" and group-oriented values as superior or inferior ways to be, but rather we aim to understand their relative effects on particular psychological, social, and economic measures (Brady, Fryberg, & Shoda, 2018).

Part 2: Registered analysis of the impact on skills training participation

A) Internal Validity

We will check whether balance was achieved across the treatment arms on the following sociodemographic variables: poverty (PMT) score, relationship to head of household (head of the household vs 1st wife/2nd wife/3rd wife/4th wife/other), age of the beneficiary, nomad status, residence in a hamlet outside the village, and household size. We will also document that we achieved balance across our stratification variables: timing of the ASP training activities (Early: February-March / Late: April), the ASP treatment arm (Complete: all components / Social: all except cash transfer), and participation in a prior ASP baseline survey (Y/N). These variables were collected before the start of this study.

The three treatment specifications are as follows:

$$Y_i = \beta_0 + \beta_1 T.Psych_i + \varepsilon_i$$

$$Y_i = \beta_0 + \beta_1 T.Personal_i + \beta_2 T.Interpersonal_i + \varepsilon_i$$

$$Y_i = \beta_0 + \beta_1 T.Sat.50_i + \beta_2 T.Sat.75_i + \varepsilon_i$$

Y_i refers to the sociodemographic variables listed above for individual i. $T.Psych_i$ refers to the pooled treatment of the two psychological conditions, which include $T.Personal_i$, indicating assignment to the "personal initiative" intervention, and $T.Interpersonal_i$, indicating assignment to the "interpersonal initiative" intervention. The reference category in these models is the control condition. $T.Sat.50_i$ and $T.Sat.75_i$ indicate group-level assignment to 50% and 75% saturation level of treatment within a group, with the reference category for both being a saturation level of 25%. We will apply standard errors clustered at the group level.

We will similarly check for balance on the variables considered for heterogeneity analyses.

B) Outcome measures

We will analyze the treatment effects on rates of participation in the business and life skills training sessions. Attendance for each session is recorded by the training program administrator on paper and later entered into a database. We will analyze the outcome of skills training participation as a continuous variable of total number of sessions attended out of 12.

C) Treatment groups

We will compare three types of treatment specifications on our main behavioral outcome, skills training participation rates.

We will assess the effect of having receiving either of the two salience interventions in the lab-in-the-field session (i.e., any treatment or "T.Psych") (n=1,332) to the control condition which received no additional treatment (n=1,296). This randomization is stratified at the group level. Secondary comparisons of interest are the effect of being randomized to one of the two types of treatment, the personal initiative ("T.Personal") or the interpersonal initiative ("T.Interpersonal") independently versus control.

The second effect of interest is the effect of saturation level of treatment (25/50/75 percent, "T.Sat") within a business and life skills training group (n=108 groups). We will assess the effect of 50% saturation versus 25% ("T.Sat.50") and 75% versus 25% ("T.Sat.75"). This treatment is randomized at the group level.

D) Hypotheses

We would hypothesize, if we have sufficient variability in the outcome measure, that those treated with a psychosocial intervention (T.Psych) would have higher rates of attendance than those in the no-treatment control, and that those in groups with higher saturation levels (50% and 75%) would have higher rates of attendance than those with the lowest saturation level (25%).

E) Primary models

1. Impact of the salience interventions

We will run ordinary least squares regression to assess the effect of any treatment, compared to control, on individual participation rate in the skills training (Y_i). We will control for the vector of stratification variables and predictive covariates (X_i), specified below. We will use standard errors clustered at the group level.

Model 1: $Y_i = \beta_0 + \beta_1 T.Psych_i + \gamma_0 X_i + \varepsilon_i$

We will also compare the effects of each of the two salience treatments relative to the control in a similar model, as follows:

Model 1a: $Y_i = \beta_0 + \beta_1 T.Personal_i + \beta_1 T.Interpersonal_i + \gamma_0 X_i + \varepsilon_i$

2. Impact of group-level treatment saturation

We will run ordinary least squares regression to assess the effect of level of group saturation level (50% vs 25% and 75% vs 25%) on the individual participation outcome Y_i. We will control for the vector of stratification variables and predictive covariates (X_i), specified below. We will use standard errors clustered at the group level.

Model 2: $Y_i = \beta_0 + \beta_1 T.Sat.50_i + \beta_2 T.Sat.75_i + \gamma_0 X_i + \varepsilon_i$

Covariates included in the X_i vector in models 1, 1a and 2
- Participation in the ASP baseline survey (Y/N)
- Timing (Early/Late)
- ASP treatment arm (Complete/Social)
- Commune
- Relationship to the head of household (head of household versus 1st wife/ 2nd wife /3rd wife /4th wife/other)
- Household size

F) Robustness and heterogeneity analysis

Alternative outcome variable construction:

We will also analyze treatment effects on a dichotomous variable of having completed all 12 sessions or not. For the dichotomous outcome, we will conduct logistic regression instead of OLS, with the same approach covariates and standard errors as above.

Additional covariates:
We will test robustness of models 1, 1a, and 2 to the addition of any sociodemographic variables found to be imbalanced (see list under "Internal validity") and other predictors of the outcome (e.g. baseline gender attitudes at the village level) to the vector of covariates.

Heterogeneity analyses
We will run models 1, 1a, and 2 above, assessing heterogeneity as follows:

Model 1: $Y_i = \beta_0 + \beta_1 \text{T.Psych}_i + \gamma_0 X_i + \delta_0 x_i + \delta_1 \text{T.Psych}_i x_i + \varepsilon_i$

Model 1a: $Y_i = \beta_0 + \beta_1 \text{T.Personal}_i + \beta_2 \text{T.Interpersonal}_i + \gamma_0 X_i + \delta_0 x_i + \delta_1 \text{T.Personal}_i x_i + \delta_2 \text{T.Interpersonal}_i x_i + \varepsilon_i$

Model 2: $Y_i = \beta_0 + \beta_1 \text{T.Sat.50}_i + \beta_2 \text{T.Sat.75}_i + \gamma_0 X_i + \delta_0 x_i + \delta_1 \text{T.Sat.50}_i x_i + \delta_2 \text{T.Sat.75}_i x_i + \varepsilon_i$

where x_i is a dichotomous dimension of heterogeneity and δ_1 identifies the heterogeneous treatment effect. We will assess heterogeneity by timing of ASP trainings (Early/Late).

G) Additional exploratory analysis

Additional heterogeneity analyses
We will explore additional dimensions, such as the relationship of the participant to head of household, gender attitudes at the village level taken from the baseline survey, and the number of approximate days between the end of the study and the start of the business and life skills trainings.

Alternative models
We will test multi-level mixed models for the primary models above.

Note on timing of pre-analysis plan
The pre-analysis plan is lodged after the completion of data collection because of timing and staffing constraints. This embedded field study had to be conducted within a very brief window of time between ASP components (sensitization and trainings) that were implemented on unpredictable timelines. In addition, the graduate student was the primary person responsible for development of the study materials, development of training materials, data collection monitoring including high frequency checks and retraining, data cleaning, and analysis. For these reasons, the graduate student has seen the data in the process of high frequency checks and data cleaning, but has not analyzed treatment outcomes.

References

Anderson, M. L., & Magruder, J. (2017). *Split-sample strategies for avoiding false discoveries* (NBER Working Paper No. w23544). Retrieved from National Bureau of Economic Research website: https://www.nber.org/papers/w23544.

Brady, L. M., Fryberg, S. A., & Shoda, Y. (2018). Expanding the interpretive power of psychological science by attending to culture. *Proceedings of the National Academy of Sciences*, *115*(45), 11406-11413.

Campos, F., Frese, M., Goldstein, M., Iacovone, L., Johnson, H. C., McKenzie, D., & Mensmann, M. (2017). Teaching personal initiative beats traditional training in boosting small business in West Africa. *Science, 357*(6357), 1287-1290.

De Mel, S., McKenzie, D., & Woodruff, C. (2009). Are women more credit constrained? Experimental evidence on gender and microenterprise returns. *American Economic Journal: Applied Economics, 1*(3), 1-32.

Duckworth, A. L., Kirby, T. A., Gollwitzer, A., & Oettingen, G. (2013). From fantasy to action: Mental contrasting with implementation intentions (MCII) improves academic performance in children. *Social Psychological and Personality Science, 4*(6), 745-753.

Eom, K., Kim, H. S., Sherman, D. K., & Ishii, K. (2016). Cultural variability in the link between environmental concern and support for environmental action. *Psychological Science*, *27*(10), 1331-1339.

Field, E., Jayachandran, S., Pande, R., & Rigol, N. (2016). Friendship at work: Can peer effects catalyze female entrepreneurship?. *American Economic Journal: Economic Policy, 8*(2), 125-53.

Gelfand, M. J., Raver, J. L., Nishii, L., Leslie, L. M., Lun, J., Lim, B. C., ... & Aycan, Z. (2011). Differences between tight and loose cultures: A 33-nation study. *Science, 332*(6033), 1100-1104.

Henrich, J., Heine, S. J., & Norenzayan, A. (2010). The weirdest people in the world?. *Behavioral and Brain Sciences*, *33*(2-3), 61-83.

Kizilcec, R. F., & Cohen, G. L. (2017). Eight-minute self-regulation intervention raises educational attainment at scale in individualist but not collectivist cultures. *Proceedings of the National Academy of Sciences, 114*(17), 4348-4353.

Laajaj, R., & Macours, K. (2017). *Measuring skills in developing countries* (World Bank Group Policy Research Working Paper No. WPS 8000). Retrieved from World Bank website: http://documents.worldbank.org/curated/en/775311488980295780/Measuring-skills-in-developing-countries.

Macours, K., & Vakis, R. (2014). Changing households' investment behaviour through social interactions with local leaders: Evidence from a randomised transfer programme. *The Economic Journal*, *124*(576), 607-633.

Markus, H., & Conner, A. (2013). *Clash! 8 Cultural Conflicts that Make Us Who We Are*. New York: Hudson Street Press.

Markus, H. R., & Kitayama, S. (1991). Culture and the self: Implications for cognition, emotion, and motivation. *Psychological review*, *98*(2), 224.

McKenzie, D., & Woodruff, C. (2013). What are we learning from business training and entrepreneurship evaluations around the developing world?. *The World Bank Research Observer, 29*(1), 48-82.

Medin, D. L. (2017). Psychological science as a complex system: report card. Perspectives on *Psychological Science, 12*(4), 669-674.

Nisbett, R. E., Peng, K., Choi, I., & Norenzayan, A. (2001). Culture and systems of thought: holistic versus analytic cognition. *Psychological Review*, *108*(2), 291.

Walton, G. M., & Wilson, T. D. (2018). Wise interventions: Psychological remedies for social and personal problems. *Psychological Review*, *125*(5), 617.