

# How Culturally Wise Psychological Interventions Help Reduce Poverty

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**WORLD BANK GROUP**

Development Impact Group &  
Social Protection and Jobs Global Practice  
June 2024



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## Abstract

Poverty is multidimensional, associated not only with a lack of financial resources, but also often social-psychological constraints, such as diminished agency and aspirations. Through a series of field experiments, this paper assesses the causal impacts of culturally wise interventions designed to build women's agency on poverty reduction efforts in rural Niger. Moreover, the study identifies a model of agency that is "culturally wise" because it is the most motivational and functional in the study cultural context. Study 1 reports descriptive evidence that an interdependent model of agency—that is grounded in social harmony, respect, and collective advancement and that accounts for relational affordances for individual goals—is predominant in rural Niger. This stands in contrast to a more self-oriented, independent model grounded in personal aspirations, self-direction, and self-advancement that is more common in the West. Study 2 explores the psychosocial mechanisms of a highly effective, multifaceted poverty reduction program that included two psychosocial interventions—a community sensitization and a life skills training, which

incorporated both models of agency. Although the results support the role of intrapersonal processes (including enhanced self-efficacy and optimistic future expectations) in driving economic impacts, there is equal, if not greater, support for relational processes (including increased subjective social standing, control over earnings, and social support). Study 3 conducts a mechanism experiment to disentangle the causal effects of interventions grounded in independent agency ("personal initiative") or interdependent agency ("interpersonal initiative"). The results show that the interdependent agency intervention, which is considered to be most "culturally wise," led to significant effects on economic outcomes as well as both intrapersonal and relational processes. By contrast, the independent agency intervention showed impacts on intrapersonal processes alone. These findings show the promise of an emerging area of research at the intersection of behavioral science, cultural psychology, and development economics for addressing complex global problems like poverty and inequality.

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*JEL codes:* D13, D91, I38, O12.

*Keywords:* poverty, behavioral science, psychology, culture, agency, graduation, economic inclusion, psychosocial.

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# 1. Introduction

“Hannu daya baya daukan jinka /  
One hand cannot lift a hut.” – Hausa proverb  
(Abdulkarim & Abdullahi, 2015)

Poverty is characterized by a lack of financial resources, but also myriad psychological and social constraints. Limited access to opportunities, social marginalization, and uncertainty about the future can lead people in poverty to feel lower optimism and less agency over their fate (Chetty et al., 2022; Markus & Stephens, 2017; Sheehy-Skeffington, 2020; Sheehy-Skeffington & Rea, 2017). A recent literature on multi-faceted approaches shows that combining economic interventions and psychosocial support can yield sustained impacts on poverty reduction and welfare over time (Banerjee et al., 2021; Blattman et al., 2016, 2017; Lang et al., 2023; Orkin et al., 2023). Some of our prior research in Niger tested a multi-faceted program that included a package of economic support plus two psychosocial interventions designed to boost women’s agency—a community film event on community aspirations, values, and norms and a one-week training on life skills like goal setting, problem solving, and decision-making. This program proved to be one of the most cost-effective multi-faceted programs in the literature to date (Bossuroy et al., 2022). However, the specific psychosocial mechanisms driving the impacts of this and other multi-faceted poverty reduction programs have not yet been fully understood. In this paper, we address this open research question by showing how agency-building psychosocial interventions contribute to poverty reduction. Furthermore, given the culturally variable nature of agency, we highlight how factoring culture into the design of psychosocial interventions is key for their effectiveness.

A small but rapidly growing literature reveals that some interventions targeting agency and related constructs like aspirations, self-efficacy, goal setting, or personal initiative can support economic development efforts in low-income countries (Bernard et al., 2023; Campos et al., 2017; Donald et al., 2017; Haushofer & Salicath, 2023; Lang et al., 2023; McKelway, 2020; Orkin et al., 2023; Wuepper & Lybbert, 2017). Indeed, having high aspirations, self-efficacy, and goal setting skills can motivate individuals to take-up new economic opportunities, make strategic, future-oriented investments, and allocate more effort to those opportunities and investments (Bernard et al., 2023; Dalton et al., 2016; Thomas et al., 2020; Wuepper & Lybbert, 2017). Yet, other studies have shown small to null results (Leight et al., 2024; Sedlmayr et al., 2020). What makes agency-building interventions effective or ineffective? We posit that such interventions will be most effective in advancing economic development when they are attuned to the models of self and agency in a given cultural context.

Agency has been defined as “the ability to define one’s goals and act upon them” (Kabeer, 1999). A literature in social and cultural psychology specifies that the model of agency that is personally motivational, socially valued, and contextually functional varies according to the cultural and socioeconomic contexts in which people live (Markus, 2016; Markus & Kitayama, 1991, 2010; Stephens et al., 2014). High-income, Western contexts are characterized by greater material abundance and personal choice, formal and impersonal institutions, and uniquely high levels of cultural individualism (Henrich, 2020; Henrich et al., 2010). There, the type of agency that is afforded and often practiced is more independent. It entails self-directed, autonomous action towards the advancement of self-defined goals and personal interests. In contrast, in rural, low-income contexts where the majority of the global population lives, people belong to tight knit, enduring webs of social connection, mutual support, and obligation that can

help individuals cope with resource scarcity and risk as well as provide them with valuable information and opportunities. In such contexts, an interdependent model of agency—grounded in responsiveness to social norms, roles, and obligations; coordination with others; and the advancement of relational goals—predominates (Adams et al., 2012; Gelfand et al., 2011; Huis et al., 2017; Markus & Kitayama, 2003; Stephens et al., 2009). There, people’s opportunity to achieve their goals often depends on the support of others, on the availability of many hands to help lift their hut.

In such interdependent sociocultural contexts, agency does not stem solely from within the person—in their own capabilities and motivation—but is shared with important others. Ghanaian cultural and social psychologist Stephen Adjei writes that “in the African epistemic worldview the person is ontologically part of the social firmament” (Adjei, 2019, p. 492). There, he continues, “negotiated agency involves joint decision making and being responsive to expectations and demands of relational others in a network of interconnectedness”, which he distinguishes from an agency grounded in independent “self-making” more common in the West (p. 495).

In more collectivist contexts, agency is likely to depend not only on a person’s own beliefs but also their ability to effectively navigate their social world and to build relational affordances for achieving their goals (see Fig. 1). In this view, the locus of agency thus shifts from being within the person to the intersection of the person and their social context. This interdependence may be especially true for low-income households in West Africa where priming financial scarcity has been shown to further increase interdependent over independent models of self (Adams et al., 2012) and in contexts where gender norms restrict women’s economic activity and potential (Bursztyn et al., 2020; Field et al., 2016).

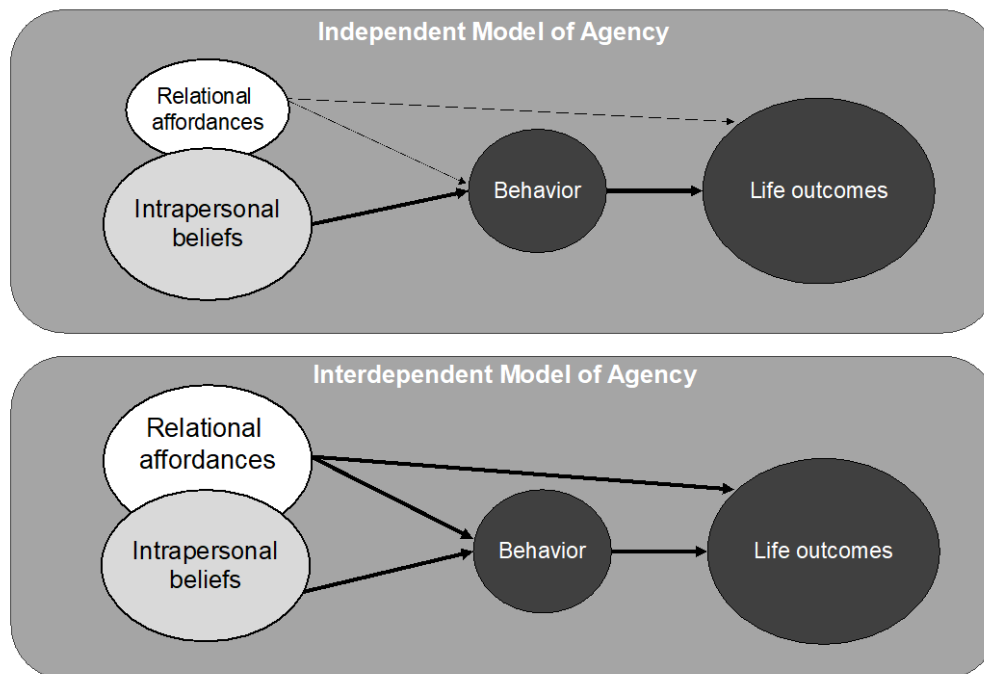


Fig. 1. Independent and Interdependent Models of Agency and Their Relationships to Behavior and Life Outcomes

This simple conceptual model shows that, in independent and interdependent models of agency, intrapersonal beliefs directly influence behavior and life outcomes, but that, in collectivistic cultural contexts where an interdependent

model of self and agency is predominant, relational affordances hold relatively greater influence over intrapersonal beliefs, behavior, and life outcomes, such as women's economic development. Figure adapted from Riemer et al., 2014; Thomas & Markus, 2023.

Psychological and behavioral science interventions are, implicitly or explicitly, grounded in models of agency. Given that the vast majority of theoretical and empirical research in the social sciences has been conducted in high-income Western countries (Thalmayer et al., 2021), it is unsurprising that independent models of agency tend to be the default (Adams et al., 2019; Thomas & Markus, 2023). For instance, a prototypical example of an independence-grounded motivational intervention common in Western contexts prompts individuals to imagine and set personal goals, to identify actions to achieve those goals through self-initiative, and to plan self-regulation strategies to cope with setbacks (Duckworth et al., 2013; Oettingen & Gollwitzer, 2010). A rare cross-cultural, large-scale experiment tested this intervention with thousands of online learners across the U.S., China, and India and found that this exercise effectively boosted academic achievement in the U.S. but showed null results in the more collectivistic contexts of China and India (Kizilcec & Cohen, 2017). Follow-up surveys suggest a potential cultural mismatch. Students in India compared to those in the U.S. saw personal academic goals as secondary to fulfilling social obligations (e.g., chores) and relational goals (e.g., not disappointing family). These results suggest that the intervention's focus on self-advancement, and its omission of relational considerations, may not have resonated with Indian students in the sample as it did with U.S. students. These findings are consistent with other cross-cultural research showing that, in India compared to the U.S., fulfilling social obligations is more motivating than achieving personal autonomy and that choices made by trusted others are more motivating than personal choices (Iyengar & Lepper, 1999; Tripathi et al., 2018). In the domain of economics, incentives based on social norms have been found to motivate effort to a greater extent compared to monetary incentives in India than the U.S. (Medvedev et al., 2024).

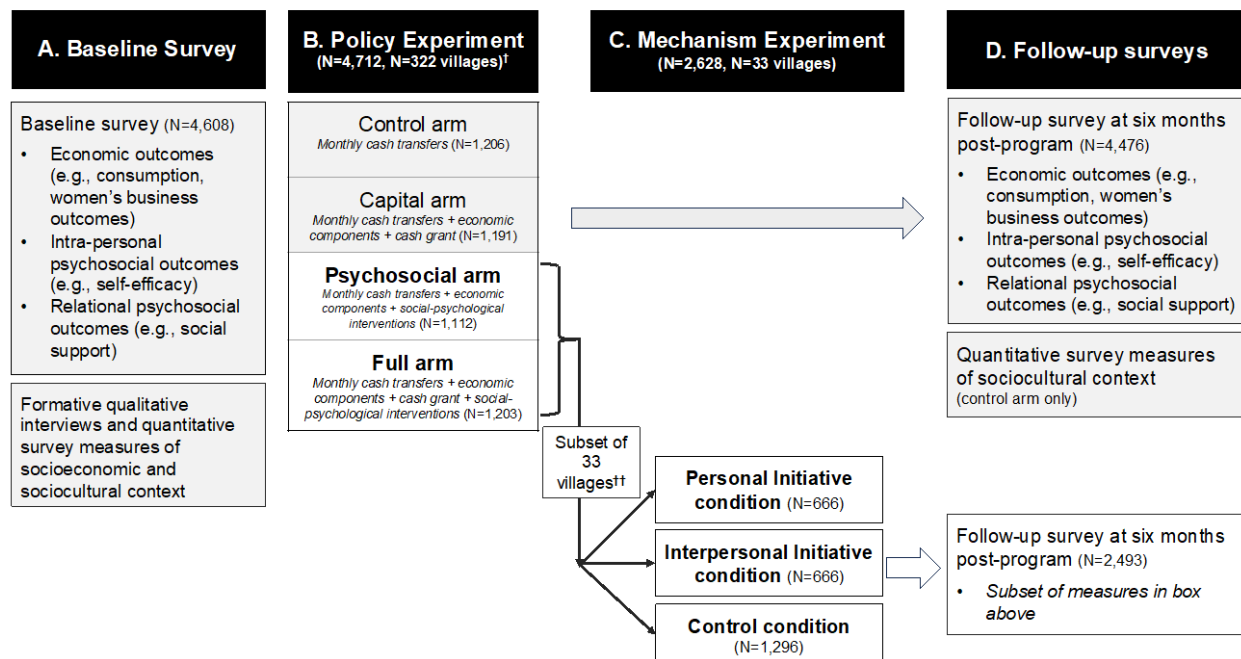
'Culturally wise interventions' actively attend to such cultural variation. Psychologically wise interventions are wise to how people make sense of themselves, others, and the social structures people seek to navigate (Walton & Wilson, 2018). 'Culturally wise' interventions are additionally wise to the fact that people are enculturated actors whose models of agency, goals, and social structures systematically vary across cultural contexts (Hoff & Stiglitz, 2016; Markus & Hamedani, 2019; Shweder, 2003). Past research has shown that incorporating culturally specific models in the representation of opportunities can foster individual motivation and performance (Stephens et al., 2012; Thomas et al., 2023; Thomas & Markus, 2023). For example, in one lab experiment in Nairobi, Kenya, Thomas, Otis, et al. (2020) found that representing cash transfers as a way to either advance independent goals like self-reliance or interdependent goals like collective growth, as compared to meeting basic needs, both enhanced intrapersonal self-efficacy but only the interdependent narrative also influenced relational affordances, such as mitigating perceived social stigma, and promoted skills building behavior. In the context of the multi-faceted poverty reduction program in rural Niger, we hypothesize that representing independent models of agency will increase women's intrapersonal beliefs, such as self-efficacy, but that representing interdependent agency intervention will additionally influence relational affordances and, ultimately, women's economic development outcomes.

In Study 1, we provide descriptive data on the sociocultural context and illustrate specific methods for designing 'culturally wise' social-psychological interventions. We find that, in rural Niger, models of women's economic agency were more interdependent than independent, situating relational factors like social harmony and respect as more important than intrapersonal

factors like self-initiative and future-orientation. By point of cultural comparison, a U.S. sample predicted the opposite pattern. In Study 2, we conduct a secondary analysis on the psychosocial mechanisms of an effective poverty reduction program that included psychosocial interventions representing both models of agency (Bossuroy et al., 2022). In this large-scale policy experiment (N=4,712), we find support for the role of intrapersonal processes (e.g., self-efficacy and optimistic future expectations) in driving impacts but similarly strong, if not stronger, support for relational processes (e.g., social standing, control over earnings, and social support). In Study 3 (N=2,628), we disentangle the impacts of independent and interdependent agency through an individual-level mechanism experiment that was embedded within the policy experiment. As predicted, we find that an interdependent agency intervention—which was grounded in collective advancement and social harmony and which we consider to be most ‘culturally wise’ for this context—led to significant improvements in women’s economic outcomes as well as intrapersonal and relational processes. However, an independent agency intervention —grounded in self-advancement and self-direction—showed impacts on intrapersonal processes alone.

## 2. Methodological Summary

The findings presented in this paper stem from a continuous engagement with the Niger Safety Nets Unit and the World Bank’s Sahel Adaptive Social Protection program over the period 2017-2022. We report results from three complementary strands of work: descriptive quantitative research that informed the design of the program and documents the specific form of agency in the population of interest, a secondary analysis of the policy experiment presented in Bossuroy et al. (2022), and a mechanism experiment examining the causal impacts of different cultural models of agency. Fig 2 represents these different studies, points of data collection, and associated sample sizes.



**Fig. 2.** Design of Policy Experiment and Mechanism Experiment

<sup>†</sup> The study participants sampled for the policy experiment was a subset of all program recipients. The total number of program recipients was 22,500 across 17 communes. The policy experiment relied on village-level randomization.

†† All program recipients in a subset of 33 villages in 6 communes, including but not limited to those participants randomly sampled for the policy experiment, were included in the mechanism experiment sample. The mechanism experiment relied on household-level randomization.

Section 3 presents descriptive findings on the cultural and socioeconomic context as well as models of economic agency (Study 1). Some of these quantitative measures were developed based on formative qualitative research, including interviews and focus groups. Quantitative data on models of agency from the Niger sample are complemented with prediction data collected from an U.S.-based online convenience sample (N=302) and were gathered ex post through the CloudResearch platform.

In Section 4, we explore psychosocial mechanisms of the highly effective multi-faceted interventions tested in Bossuroy et al. (2022) by conducting additional analyses of the baseline and follow-up surveys (Study 2). This four-arm policy experiment (N=4,712) included a control arm, which was a national safety net program that provided monthly cash transfers of US\$38.95 (in 2016 PPP) to the lowest income households in rural villages in Niger. All three treatment arms included a core set of economic components similar to the broader literature on multi-faceted interventions (Banerjee, Duflo, Goldberg, et al., 2015), including the monthly cash transfers plus savings group formation, micro-entrepreneurship training, group coaching and market access facilitation. To those components, the Psychosocial arm added two psychosocial interventions, a community sensitization and a 1-week life skills training (described in greater detail in Section 4). The Capital arm instead added a lump sum cash grant of US\$311 (in 2016 PPP). The Full arm included all components.

Here, we focus on the mechanisms that drove the impacts of the Psychosocial and Full arms (i.e., those that included the psychosocial interventions), which were assessed in a follow-up survey conducted approximately six months after the end of program and in particular one year after the delivery of the psychosocial interventions. Analyses focus on exploring psychosocial mechanisms of effects on economic development, specifically women's off-farm business development, a primary target of the program. Psychosocial variables include self-reported intrapersonal beliefs and experiences (e.g., self-efficacy, optimistic future expectations, mental health) and relational beliefs and affordances (e.g., social standing, social support, control over decision-making in the household, social norms). All measures were collected by enumerators blind to condition via in-person surveys.

In Section 5, we present a pre-registered mechanism experiment (Study 3) that was embedded within the arms of the policy experiment that included psychosocial interventions (i.e. the Psychosocial and Full arms). This mechanism experiment sought to test whether independent agency and/or interdependent agency causally drove observed increases in economic development and assess associated intrapersonal and relational processes. Notably, we expanded the sample to include all program participants, regardless of their participation in the policy experiment, in a subset of 33 villages (N=2,628) and thus the mechanism and policy experiment samples were largely non-overlapping (see Fig. S1). In an individual-level experiment, we tested the effects of receiving one of two brief social-psychological interventions following the program's community sensitization—a brief independent agency intervention grounded in self-direction and self-advancement (“Personal Initiative”) or an interdependent agency intervention grounded in social harmony and collective advancement (“Interpersonal Initiative”). These were compared to a control condition of no additional intervention. We assess economic and psychosocial outcomes collected one year later in a follow-up endline survey.



Across Sections 4 and 5, we focus on three types of outcomes: those related to economic development, intrapersonal psychosocial processes, and relational psychosocial processes. Economic development outcomes include consumption (a proxy for poverty), food security, and women's business outcomes. Intrapersonal psychosocial outcomes include beliefs about the self (e.g., self-efficacy), about one's future (e.g., positive future expectations for mobility), and psychological well-being (e.g., life satisfaction, depressive symptoms), which we situate as intrapersonal resources for goal pursuit. Relational psychosocial outcomes include social capital (e.g., social support, financial support, participation in community organizations), social influence (e.g., social standing, control over business decision-making), and social norms, which we situate as relational affordances for goal pursuit. All of these outcomes were measured in the policy experiment sample while a subset was measured in the mechanism experiment sample given timing constraints.

Further details on experimental design and outcome measures are provided in the Methods section in the Appendix.

### **3. Study 1: Descriptive Findings on Agency in Context**

The formative research phase aimed to understand women's models of economic agency in rural Niger. In particular, we explored which factors women viewed as motivational, socially valued, and effective for advancing their economic mobility. We also sought to build 'interpretive power' around these models of agency, i.e., to understand them in relation to the affordances and constraints of the socioeconomic and cultural context (Brady et al., 2018).

First, in the baseline survey of the policy experiment, we found that, as is common in collectivist societies, behavioral interdependence was broadly practiced and valued. In survey responses, 90% of women agreed or strongly agreed that "when making a decision, it is important to take into account the opinions of other members of your community," 79% agreed or strongly agreed that "it is your duty to take care of others in your village even if you must sacrifice yourself," and 89% reported they do what their husbands say with their money rather than doing what they alone want. According to additional data collected among the Study 3 control group, 86% of the respondents reported that they preferred for households in the village to develop together versus independently ( $\chi^2(1, N=1,215)=612.98, p<.001$ ).

Second, these interdependent tendencies were not only practiced and valued but also seen as ontologically useful and effective in this context. In order to understand beliefs about women's economic agency in particular, we asked women to rank the importance of different psychosocial factors as drivers of and barriers to women's economic success. In each of these questions, we asked participants to rank four factors—two of which related to intrapersonal processes and two to relational. Intrapersonal factors included personal initiative, hard work, persistence, and planning for the future, which are commonly reflected in Western goal setting and self-regulation interventions and other entrepreneurial programs (Campos et al., 2017; Frese & Fay, 2001; Oettingen & Gollwitzer, 2010). The relational factors were derived from our formative qualitative interviews and included social harmony, peacefulness,<sup>6</sup> respect of others, and good social connections. Responses were collected among the control group of the policy experiment in a follow-up survey (N=1,216). We independently collected predictions from a U.S. sample as a point of cultural comparison (N=302).

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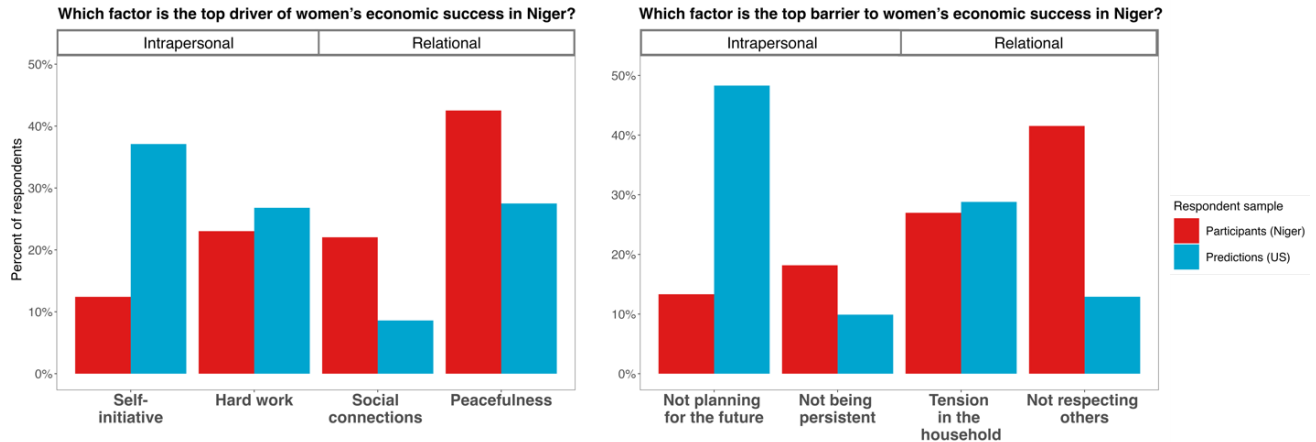
<sup>6</sup> Formative qualitative suggested that 'peaceful' refers both to personal inner peace and to social harmony, given their inevitable interconnectedness in this context. Other research in West Africa similarly finds that 'peace of mind' is 'a signal that one has met social expectations' (Osei-Tutu et al., 2020).

As shown in Fig. 3 (red bars), Nigerien women ranked peacefulness (i.e., social and inner harmony) as the top factor driving women's economic success, followed by hard work, social connections, and, lastly, self-initiative. By contrast, when U.S. respondents were asked to predict which of these factors would be the most important for low-income women's economic success in Niger (Fig. 3, blue bars), they ranked self-initiative as the most important, which was the factor Nigerien women had ranked last. Collapsing across the two relational factors and the two intrapersonal factors, the relational factors were perceived as significantly *more* important drivers than the intrapersonal factors among the Niger sample ( $\chi^2(1, N=1,216)=103.06, p<.001$ ) and significantly *less* important among the U.S. sample ( $\chi^2(1, N=302)=23.36, p<.001$ ).

In a consistent pattern, when asked to rank factors that would serve as barriers to women's economic success, Nigerien women participants ranked the relational factors—a lack of respect for other people and household tensions—as the top barriers and as more important barriers overall than the intrapersonal factors—not being persistent in one's efforts and not planning for the future ( $\chi^2(1, N=1,216)=166.53, p<.001$ ). Conversely, U.S. respondents predicted that the top barrier would be the intrapersonal factor of not planning for the future, which was the factor ranked lowest by Nigerien women, and more generally, they ranked the intrapersonal factors as significantly more important barriers than the relational factors ( $\chi^2(1, N=302)=33.21, p<.001$ ) (see Fig. 3).

These data do not imply that intrapersonal factors do not matter in Niger or relational factors do not matter in the U.S. but rather that relational factors may play a larger role, either in perception or reality, in determining women's economic outcomes in the sociocultural context of rural Niger. Perceiving relational factors to be more critical ingredients for success than intrapersonal factors may be adaptive to the local cultural context in which rural Nigerien women live. Women in this study were from the lowest income households in one of the lowest income countries in the world. Over 90% had never been to school and almost all were largely illiterate. They lived in remote areas, on average 73 minutes away from the nearest market. In formative research, women reported encountering strangers, i.e., people they do not know, rarely (approximately twice per month). In these remote, rural areas with low access to formal education and technology, women are highly dependent on other people in their village and word-of-mouth for economic information, opportunities, and resources.

Women's perceptions that social harmony, respect, and status matter to their economic success may relate to a need to build social capital and social influence in order to achieve one's economic goals. By comparison, intrapersonal factors, like personal motivation, drive, and future orientation, may be necessary but ultimately limited by the relational affordances that women do or do not have. We thus hypothesized that, in this cultural context, agency-building psychosocial interventions would translate to improvements in women's economic development when interventions building women's personal aspirations and goals were also coupled with community-level interventions building relational affordances, i.e., their social capital, social support, and social influence.



**Fig. 3.** Models of women's economic agency according to low-income women participants in Niger and predictions of a U.S. sample

#### 4. Study 2: Policy Experiment of a Multi-Faceted Poverty Reduction Program with Culturally Wise Interventions

In the policy experiment presented in Bossuroy et al. (2022), we tested variants of a multi-faceted poverty reduction program that included two psychosocial interventions (as part of the Psychosocial and Full arms). These interventions included a community sensitization—an event with a 20-minute film of realistic fiction about the story of a woman named Amina followed by a group discussion on community aspirations, values, and norms—and a week-long life skills training—which built upon the film and taught effective decision-making, problem-solving, goal setting, interpersonal communication, and women's leadership. We consider these interventions to be wise psychosocial interventions because they focus on people's construals of economic development and its relation to their broader goals and values. These agency interventions sought to support women in envisioning new aspirations and goals and developing skills and strategies for achieving those goals (Donald et al., 2017). They included elements of both independent agency—through modeling proactivity, persistence, and self-direction—in line with current best practice (Bernard et al., 2023; Campos et al., 2017) and interdependent agency—through modeling social respect, collaboration, and shared aspirations—in line with a culturally wise intervention approach tailored to cultural context. Full intervention details are described in Bossuroy et al. (2022) Supplemental Materials.

Few studies have developed and tested such precisely targeted psychosocial components, evaluated their effects against other economic components (e.g., cash grants) in poverty reduction programs, or included such a wide range of psychosocial outcome measures within the evaluation. As described in Bossuroy et al. (2022), we found striking results of including these two psychosocial interventions in a multi-faceted poverty reduction program on a range of both economic and psychosocial outcomes. The program variants that included the psychosocial interventions were highly cost-effective and showed statistically significant impacts on consumption (a proxy measure of poverty), food security and women's businesses. For instance, by eighteen months after the end of the program, those in the Psychosocial and Full arms experienced increased household consumption by 0.18 SD and 0.25 SD, respectively.<sup>7</sup> The

<sup>7</sup> Average daily consumption per adult equivalent was increased from USD\$1.70 in the control group to USD\$1.88 in the Psychosocial arm and USD\$1.95 in the Full arm.

Psychosocial and Full arms increased beneficiaries' annual business revenues by USD\$155.50 (or, 62.26%) and USD\$267.85 (or 107.39%), respectively. Moreover, food security rose by 0.47 SD in the Psychosocial arm and 0.63 SD in the Full arm. While many of these positive effects were similar in size to the Capital arm that included economic components alone, the program was most cost-effective when it included the psychosocial interventions. The benefit-to-cost ratio of the Psychosocial arm was 2.98, and the Full arm 2.08, which were both significantly greater than that of the Capital arm, being 1.25,<sup>8</sup> where one represents the break-even point when benefits on household consumption are the same as program costs.

Here, we explicate the theoretical basis of those psychosocial interventions and further explore the psychosocial mechanisms through which they fueled economic development. In the follow-up surveys, we measured approximately 100 psychosocial items within 13 indices. In this section, we present additional analyses on these psychosocial outcomes to add converging correlational evidence on which are the likeliest psychosocial processes through which those interventions may have operated, of those measured. Building on these analyses, in the following section, we present results of a mechanism experiment to identify causal effects of specific psychosocial factors.

Given the importance and strength of relationships in shaping women's behavior and outcomes in this low-income, interdependent cultural context (see Fig. 1) and building on our prior laboratory studies (Thomas et al., 2020), we hypothesized that enhancing intrapersonal beliefs alone (e.g., self-beliefs) may be limited in influencing women's ultimate economic outcomes unless women's relational affordances (e.g., social capital, social influence) were also strengthened.

For this analysis, we first compute the standardized main treatment effects at follow-up across all psychosocial outcomes of the Psychosocial arm compared to the Control arm (Table 1, column 3), as well as the marginal effects, i.e., added value, of the psychosocial interventions by taking the difference between the Full and Capital arms (Table 1, column 4).<sup>9</sup> We rank-order the main treatment effects to highlight those with the highest effect size estimates. Second, we assess the extent to which the psychosocial variables positively predict, or correlate with, women's off-farm business revenues, using data from the control group at follow-up (Table 1, column 5). We focus on women's business outcomes because they were a primary target of the program and a proximal step on the path to reduce poverty. We present bivariate correlations for comparability across outcomes and interpretability in terms of effect size. Finally, given different limitations of these analysis approaches, we group psychosocial variables according to a triangulation exercise: we consider the outcomes with the greatest likelihood of being mechanisms to be those that show the strongest and most points of supportive evidence across these three analyses (i.e., columns 3-5 of Table 1).

## Results

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<sup>8</sup> These estimates assume 50% annual dissipation of impact and 5% discount rate. They are conservative given that the benefits only include effects on consumption and not on other indicators of wealth (e.g., assets).

<sup>9</sup> We present both main and marginal effects because they have different interpretations. The comparison of the Psychosocial arm versus the Control arm represents the causal effects of the psychosocial interventions *plus* the core economic component. The difference between the Full arm effect minus the Capital arm effect represents the marginal effect of the psychosocial interventions net of potential complementarities with the core economic components. Of note, the cash grant may have also affected psychosocial outcomes (e.g., Orkin et al., 2023) in ways that may have limited the scope for additional effects from the psychosocial interventions in the Full arm. Given these different interpretations, we triangulate across both types of comparisons.

Overall, we find evidence that supports intrapersonal processes and equally strong, if not stronger, evidence that supports relational processes as possible mechanisms of the observed economic impacts of the psychosocial program variants. Panel A shows the psychosocial factors with the strongest and most points of supportive evidence across the three columns of Table 1. In order, these relate to women's social influence in the community and household (subjective social standing, control over earnings in the household, and social norms) and to their social capital (collective action, social support), followed by positive intrapersonal beliefs about the self and one's future (self-efficacy, future expectations for socioeconomic mobility, and mental health).

Related to social influence, the psychosocial interventions specifically increased where women placed themselves on a ladder of socioeconomic standing in their community, from rating themselves as being below average to average, as well as how much they felt respected and their opinion followed in their community. The psychosocial interventions also increased women's social capital, particularly participation and leadership in community organizations and contributions to community projects. We also find main but not marginal treatment effects (panel B) on women's perceived social support—particularly reports of having more business mentors, mentees, and role models—and on perceived social norms—particularly perceptions that women's micro-entrepreneurship was more widely practiced and more socially acceptable. Within the household, the psychosocial interventions increased how much control women felt they had, especially for decisions around off-farm businesses and livestock.

Significant effects across all columns of Table 1 were also observed among the more intrapersonal psychosocial variables of self-efficacy, future expectations, and mental health. The psychosocial interventions increased women's perceived efficacy to achieve their goals, particularly feeling more capable and confident in their problem-solving abilities. These interventions also enhanced women's hope for their future, including positive expectations for their economic mobility and life satisfaction in two years and intergenerational economic mobility for their descendants.

Of all psychosocial outcomes, the variables of social standing ( $r(1150)=0.14$ ,  $p<0.001$ ) and control over earnings ( $r(1150)=0.17$ ,  $p<0.001$ ) showed the highest correlations with women's business revenues in the control group. Self-efficacy ( $r(1150)=0.11$ ,  $p<0.001$ ), future expectations ( $r(1150)=0.07$ ,  $p=0.025$ ), social support ( $r(1150)=0.11$ ,  $p<0.001$ ), and social norms ( $r(1150)=0.13$ ,  $p<0.001$ ) also showed significant correlations (see column 5). Similar patterns of significance were seen when psychosocial variables at this follow-up were correlated longitudinally with women's business revenues at the subsequent follow-up one year later in the control group (see Table S1).

In addition to being significantly correlated with women's business revenues, the variables of social standing, control over earnings, social support, and social norms were also correlated with three additional indicators of beneficiary and household business engagement: the number of days beneficiaries worked in the past month on business, beneficiaries' financial investments in their businesses, and the total number of household businesses (see Table S2), each of which significantly increased in the Psychosocial arm compared to the Control arm (see Bossuroy et al. (2022) Table S1.9b and Table S1.6). A striking finding, as reported in Bossuroy et al. (2022), was that other household members' revenues and number of businesses increased alongside those of women's own businesses in the Psychosocial and Full arms. We see that the growth in household business was particularly predicted by an increases in supportive social norms ( $r(1150)=0.17$ ,  $p<0.001$ ), women's social standing ( $r(1150)=0.13$ ,  $p<0.001$ ), and their

control over earnings ( $r(1150)=0.12$ ,  $p<0.001$ ), suggesting the development of new economic and social dynamics within the household.

Moreover, social standing, social support, self-efficacy, and future expectations appear to be nodal, being correlated with most or all other psychosocial variables in Panels A and B (see Table S3). Across the results presented in Tables 1, S1, S2, and S3, social standing appears to be the psychosocial variable with the most points of supportive evidence as a plausible psychosocial mechanism of the psychosocial interventions' impacts on business engagement and revenues, followed by women's control over earnings, self-efficacy, optimistic future expectations, social support, and social norms.

Although it is not possible to identify causality among these psychosocial and economic variables through this study design, it is likely that they interacted in positive recursive processes with each other (Kenthirajah & Walton, 2015). As an example of such a recursive cycle consistent with the psychosocial interventions' design and the observed results, the life skills trainings could have enhanced self-efficacy and community sensitization could have enhanced social standing and future expectations, motivating women to kickstart new businesses, which could have fueled their social influence over business decision-making in the household, allowing for more investment in their business and greater food security, and so on. Such positive recursive processes, regardless of whether they are driven by the measured variables or others, are furthermore suggested by the fact that, in the Psychosocial arm compared to the Control arm, impacts on women's mental health, household consumption, and food security grew over time after the first follow-up (Bossuoy et al., 2022).

While Western-based behavioral science and psychological interventions have historically focused on intrapersonal processes, relational factors appeared to be critical to intervention effectiveness in this cultural context. These results suggest that agency-building interventions designed to boost intrapersonal factors alone may have seen more limited effects because such a design would not fully align with the cultural context grounded in relational barriers and affordances. In a mechanism experiment embedded in the policy experiment, we next assess the distinct causal roles of brief independent and interdependent agency interventions on women's economic outcomes. Respectively, these targeted specific intrapersonal or intrapersonal and relational processes.

**Table 1.** Impacts of the Psychosocial Interventions on Psychosocial Outcomes in the Policy Experiment, and Their Associations with Women's Economic Outcomes

(1) Index	(2) Example item in index	What were the largest impacts of the psychosocial interventions on psychosocial outcomes at follow-up?		How much do psychosocial factors predict women’s business development?
		(3) Main Effect of Psychosocial vs Control arm	(4) Marginal Effect of Psychosocial Interventions (Full – Capital arms)	(5) Bivariate correlations with women’s business revenues
		<i>Standardized effect size (SE)</i>	<i>Standardized effect size (SE)</i>	<i>Correlations (r)</i>
Panel A. Variables that Show Main and Marginal Treatment Impacts of Psychosocial Interventions and Positively Predict Women’s Business Revenues				
Collective action	Membership in community associations	0.34*** (0.05)	0.12* (0.05)	0.05†
Social standing	Current subjective socio-economic standing	0.18*** (0.04)	0.14** (0.04)	0.14***
Self-efficacy	Feels they can find multiple solutions to problems	0.16*** (0.04)	0.17*** (0.04)	0.11***
Future expectations	Expected socio-economic standing in 2 years	0.15*** (0.04)	0.16*** (0.04)	0.07*
Control over earnings‡	Has influence in business decisions	0.13** (0.04)	0.06† (0.04)	0.17***
Mental health	Feels peaceful	0.10* (0.04)	0.10* (0.04)	0.05†
Panel B. Variables that Show Main but not Marginal Treatment Impacts of Psychosocial Interventions and Positively Predict Women’s Business Revenues				
Social support	Number of business mentees	0.24*** (0.04)	0.05 (0.06)	0.11***
Perceived social norms	Perceived norms of women having businesses	0.19*** (0.04)	0.04 (0.04)	0.13***
Intra-household dynamics	Trusts partner to act in one’s interest	0.07† (0.04)	-0.00 (0.04)	0.05†
Panel C. Variables that Show Main and/or Marginal Impacts of Psychosocial Interventions but Do Not Significantly Predict Women’s Business Revenues				

Perceived financial support <sup>‡</sup>	Can count on village when in need of help	<b>0.23***</b> (0.05)	<b>0.14**</b> (0.04)	0.00
Social cohesion & community closeness	Trusts women in village	<b>0.13*</b> (0.05)	0.06 (0.04)	0.01
<b>Panel D. Variables that Do Not Show Significant Impact of Psychosocial Interventions</b>				
Violence perceptions	Knows women with tension in household (reverse-coded)	-0.04 (0.04)	0.00 (0.03)	-0.01
Controls household resources	Has influence in large purchase decisions	0.05 (0.04)	0.04 (0.04)	<b>0.08**</b>

Data is from the policy experiment sample. Light grey coloring indicates  $p > .10$ . Significance levels are indicated as follows:  $\dagger p < .10$ ,  $*p < .05$ ,  $**p < .01$ ,  $***p < .001$ . The <sup>‡</sup> symbol indicates that the measure has been slightly modified from Bossuoy et al. (2022) to exclude objective economic variables. For columns 3 and 4, the sample size was  $N=4476$  for all indices, except controls household resources ( $N=4161$ ). For column 5, correlations were computed in the control group alone at the six-month follow-up and the sample size was  $N=1152$  for all indices, except controls household resources ( $N=1099$ ). Note that the item chosen for column 2 is that showing the highest treatment effect estimate and is paraphrased for brevity. Variable construction can be found in Bossuoy et al. (2022) Supplementary Information. For interpretation, we classify these psychosocial variables as follows: intrapersonal variables (self-efficacy, optimistic future expectations, mental health); relational variables related to the community (social standing, collective action, social support, social norms, financial support, social cohesion); and relational variables related to the household (control over earnings, intrahousehold dynamics, IPV perceptions, control over household resources).

### 5. Study 3: Mechanism Experiment on Personal and Interpersonal Models of Agency

We use the mechanism experiment to further analyze models of economic agency (Walton & Wilson, 2018). Specifically, we deliver brief interventions designed to make more salient one of two interpretations of behavior modeled in the film projected during the community event. A “Personal Initiative” intervention portrayed independent agency grounded in self-advancement and self-direction. An “Interpersonal Initiative” intervention portrayed interdependent agency grounded in collective advancement and social harmony. We hypothesized that, while both interventions may be intrapersonally motivating given their focus on aspirations, the interpersonal-oriented intervention would best match the more interdependent cultural and socioeconomic context and thus show significant effects on women’s economic behavior and outcomes over time.

The mechanism experiment (Ludwig et al., 2011) was embedded in the arms of the policy experiment that included the psychosocial components (Psychosocial and Full arms). Table S4 describes the sample and shows that balance was achieved on key variables across experimental arms. This experiment was randomized at the individual level and tested two psychosocial



interventions against a control condition.<sup>10</sup> We designed the independent agency intervention based on motivational exercises developed and tested primarily in Western populations, specifically personal initiative training and mental contrasting and implementation intentions (Campos et al., 2017; Duckworth et al., 2013; Frese & Fay, 2001; Kizilcec & Cohen, 2017; Oettingen & Gollwitzer, 2010). The interdependent model intervention followed the same structure but was grounded in local forms of interdependent agency, as identified in the formative qualitative and quantitative research (see Fig. 3). Given this culturally grounded design, we consider the latter to be more culturally wise.

These brief psychological interventions were comprised of a four-minute video recap of Amina's story and a 20-minute reflection exercise that prompted women participants to relate Amina's story to their own economic goals and behaviors. Fig. 4 displays example images from the videos. These interventions were delivered in the weeks following the program's community sensitization and prior to the start of the business and life skills trainings. Field staff from the survey firm were trained by the research team and conducted these brief interventions in person with participants.

Both videos recapped Amina's economic activity, trajectory, and ultimate success in the same way, but they differed in their portrayal of her motives for and psychosocial processes of goal pursuit. In the first "Personal Initiative" condition, participants watched a recap of the video that portrayed the main character, Amina, as becoming a standout entrepreneur by being proactive in planning her business goals, innovative in her choice of products, and strategic and competitive in the marketplace. Her behaviors reflect themes taught in personal initiative trainings (Campos et al., 2017). Then, participants completed a mental contrasting and implementation intentions exercise (Duckworth et al., 2013; Kizilcec & Cohen, 2017; Oettingen & Gollwitzer, 2010), which prompted participants to set goals and identify intrapersonal and structural resources and barriers as well as ways to overcome those barriers. They were asked, for instance, "What changes would you like to see for your future?", "What could stand in the way of your goals?", and "How could these obstacles be overcome?"

In the second "Interpersonal Initiative" condition, the recap portrayed Amina as becoming a respected entrepreneur in her community by actively seeking counsel from her elders on developing her businesses, being collaborative with her husband in decision-making, and being generous with other women in her community by sharing her financial knowledge. In this way, she actively sought ways to maintain peaceful relationships. Participants then also completed a motivational goal-setting and planning strategy but this exercise was modified to focus on relational goals, barriers, and social strategies. For instance, after being asked about their goals for their future, women were asked, "How would these goals help your family and village?", "How do women help each other in this community?", and "If you experienced conflicts with others, who could you talk to for advice and encouragement?"

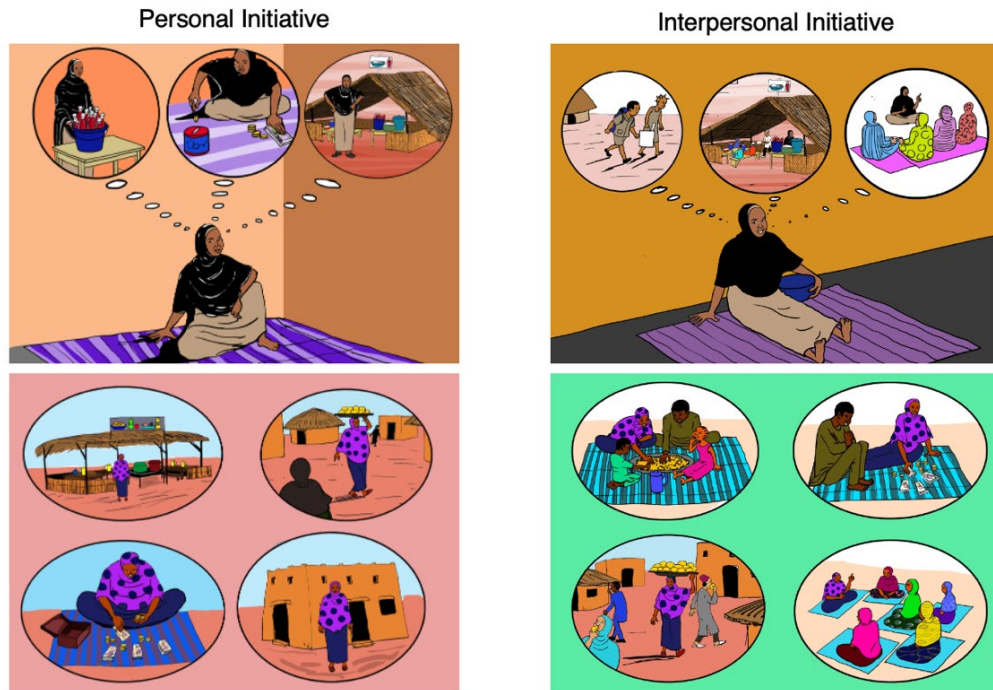
In line with our pre-registered empirical strategy, we regressed all outcomes on the treatment conditions and controlled for randomization strata.<sup>11</sup> While we pre-registered cluster robust standard errors to account for the non-randomized clustering of women into savings and training groups within the program, recent evidence has suggested that approach to be overly

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<sup>10</sup> We also randomized the proportion of individuals within a village (25%, 50%, or 75%) that were treated with one of the two interventions. Table S10 and Table S11 display results from that village-level randomization on psychosocial and economic outcomes.

<sup>11</sup> Those included timing of the delivery of program components, assignment to Full or Psychosocial treatment arm in the policy experiment, and participation in the policy experiment baseline survey.

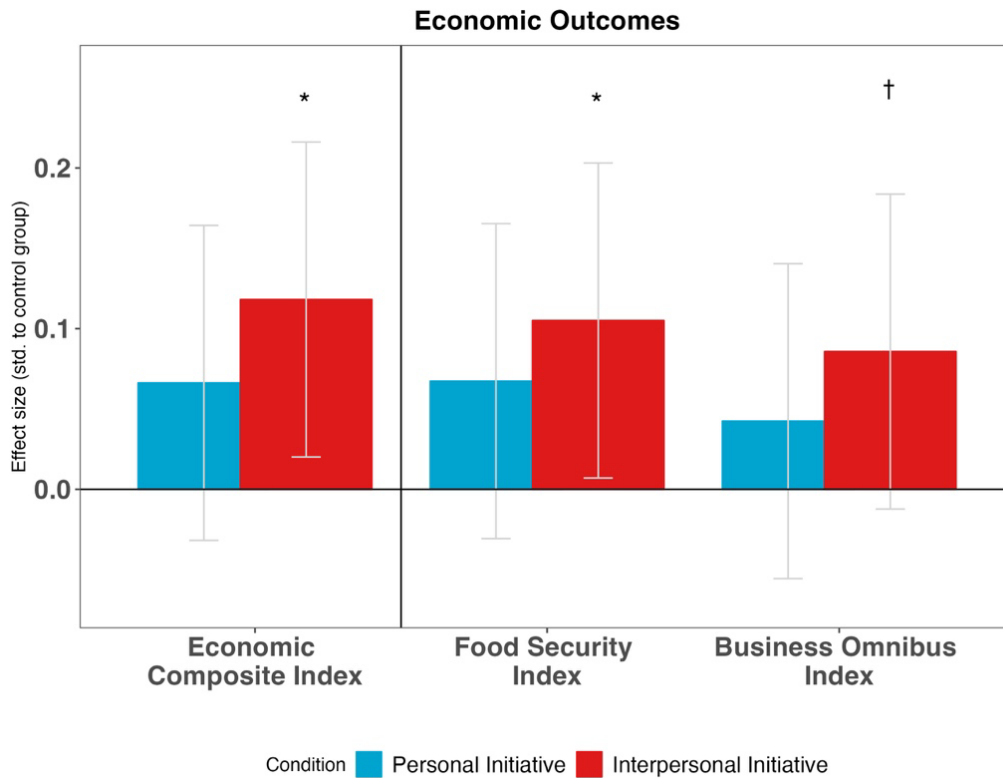
conservative and thus we prioritize robust standard errors in interpretation but present cluster robust standard errors as well (Abadie et al., 2022). Treatment effect estimates for indices represent the effect of each psychosocial intervention condition compared to control in terms of standard deviations (standardized to the control condition's mean and standard deviation).



**Fig. 4.** Example Images from the Personal and Interpersonal Initiative Intervention Videos Displayed in the Individual-Level Mechanism Experiment

## Results

**Economic outcomes.** We find significant positive effects of the Interpersonal Initiative intervention one year later on our primary index of economic outcomes ( $d_{II}=0.12$ ,  $SE=0.05$ ,  $p=.012$ ), which was driven by increases in both sub-indices of food security and women's business outcomes. In contrast, while directionally positive, the effects of the Personal Initiative intervention on the economic composite were not statistically significant ( $d_{PI}=0.07$ ,  $SE=0.05$ ,  $p=.168$ ), nor on the sub-indices (see Fig. 5 for indices and Table S6 for all economic items).



**Fig. 5.** Impacts of Interpersonal and Personal Initiative interventions on economic outcomes at 1-year endline in mechanism experiment

The economic composite index is a composite of the food security and business omnibus indices, which respectively included a subset of variables used in the policy experiment. Point estimates represent the effect of each psychosocial intervention condition compared to control in terms of standard deviations (standardized to the control condition). Regressions control for randomization strata, and standard errors are robust. Error bars are 95% CI. † $p < .10$ , \* $p < .05$ .

Specifically, the Interpersonal Initiative intervention improved food security ( $d_{II}=0.11$ ,  $SE=0.05$ ,  $p=0.029$ ), comprised of both the frequency of household food security and women's dietary diversity, while the Personal Initiative intervention showed directly positive but not statistically significant effects ( $d_{PI}=0.07$ ,  $SE=0.05$ ,  $p=0.152$ ). The Interpersonal Initiative intervention also marginally increased a business omnibus index ( $d=0.09$ ,  $SE=0.05$ ,  $p=0.069$ ), comprised of sub-indices of business engagement ( $d=0.09$ ,  $SE=0.05$ ,  $p=0.053$ ) and business performance ( $d=0.05$ ,  $SE=0.05$ ,  $p=0.354$ ). By contrast, the Personal Initiative intervention produced directionally positive but not significant effects on the business omnibus index ( $d=0.04$ ,  $SE=0.05$ ,  $p=0.388$ ), including its constituent sub-indices (business engagement ( $d=0.05$ ,  $SE=0.05$ ,  $p=0.294$ ) and business performance ( $d=0.00$ ,  $p=0.943$ )). As an example of results on business engagement indicators, while 82% of women in the control condition and 80% of women in the Personal Initiative condition ( $SE=0.02$ ,  $p_{PI}=0.778$ ) owned or managed at least one business, this percentage was 84% in the Interpersonal Initiative condition ( $SE=0.02$ ,  $p_{II}=0.079$ ).

The positive economic effects of the Interpersonal Initiative intervention were above and beyond those achieved by the multi-faceted Full and Psychosocial packages tested in the policy experiment, which respectively yielded effect sizes of 0.08 standard deviations and 0.27 standard deviations on food security and 0.21 standard deviations and 0.39 standard deviations on

beneficiary total revenues at this same follow-up point.<sup>12</sup> These results suggest that representing women's economic activity in terms of interdependent agency contributed to driving the economic impacts of the psychosocial interventions in the multi-faceted program.

Given insufficient power to detect differences between the two intervention conditions, we did not pre-register a comparison among them, and post-hoc analyses show no difference between the psychosocial intervention conditions on the economic composite index (difference of  $d=0.05$ ,  $SE=0.05$ ,  $p=.340$ ), intrapersonal psychosocial index (difference of  $d=-0.02$ ,  $SE=0.05$ ,  $p=.693$ ), or relational psychosocial index (difference of  $d=0.04$ ,  $SE=0.06$ ,  $p=.446$ ) (see Tables 2 and S5). Similarly, we find no difference between these two conditions on any measure taken immediately post intervention delivery (see Table S12), with the exception of those in the Interpersonal Initiative condition being marginally less likely than those in the Personal Initiative condition to anticipate being seen negatively by those in their family and community ( $\beta=-0.03$ ,  $p=0.088$ ).

We also pre-registered analyses on administrative data for participation rates in the business and life skills trainings that occurred shortly after the delivery of these Initiative interventions and found no difference across conditions. However, this is likely due to ceiling effects given that the median number of sessions attended by women in all conditions was 12 of 12 sessions offered ( $M_{Control}=10.81$ ;  $\beta_{PI}=-0.09$ ,  $t(2622)=-0.71$ ,  $p=0.480$ ;  $\beta_{II}=-0.07$ ,  $t(2622)=-0.62$ ,  $p=0.538$ ).

**Psychosocial outcomes.** In addition to economic outcomes, we also assessed effects on psychosocial outcomes that are important indicators of psychological and social well-being on their own, but also constitute possible mechanisms of the observed economic impacts. On a composite measure of all psychosocial outcomes, the Interpersonal Initiative and Personal Initiative interventions both produced significant positive impacts ( $d_{II}=0.12$ ,  $SE=0.05$ ,  $p=.015$ ;  $d_{PI}=0.10$ ,  $SE=0.05$ ,  $p=.043$ ). As predicted, and similar to results observed in prior related experiments (Thomas et al., 2020), both psychosocial interventions improved intrapersonal psychological outcomes, and the Interpersonal Initiative intervention additionally trended towards positive effects on relational outcomes (see Table 2).

Both interventions produced similar positive impacts on a composite index of intrapersonal outcomes ( $d_{PI}=0.13$ ,  $SE=0.05$ ,  $p=.004$ ;  $d_{II}=0.12$ ,  $SE=0.04$ ,  $p=.010$ ). These effects were driven by both interventions enhancing women's positive expectations for their future socioeconomic mobility ( $d_{PI}=0.12$ ,  $SE=0.05$ ,  $p=.019$ ;  $d_{II}=0.15$ ,  $SE=0.05$ ,  $p=.002$ ). Both interventions prompted and role modeled goal setting for socioeconomic mobility and thus, in this sense, both were effective in advancing this primary psychological goal. The Personal Initiative intervention also generated marginal increases in subjective well-being ( $d_{PI}=0.09$ ,  $SE=0.05$ ,  $p=.049$ ) and self-efficacy ( $d_{PI}=0.09$ ,  $SE=0.05$ ,  $p=.068$ ), consistent with the focus of that intervention on the self. The Interpersonal Initiative intervention produced directionally positive effects on subjective well-being ( $d_{II}=0.08$ ,  $SE=0.05$ ,  $p=.089$ ) but not on self-efficacy ( $d_{II}=0.02$ ,  $SE=0.05$ ,  $p=.595$ ).

The Interpersonal Initiative intervention produced marginally significant effects on the relational composite index ( $d_{II}=0.09$ ,  $SE=0.05$ ,  $p=.075$ ), whereas the Personal Initiative intervention produced directionally positive but not statistically significant differences ( $d_{PI}=0.05$ ,  $SE=0.05$ ,  $p=.338$ ). The Personal Initiative condition showed no impact on household or partner dynamics (household:  $d_{PI}=0.03$ ,  $SE=0.05$ ,  $p=.458$ ; partner:  $d_{PI}=0.07$ ,  $SE=0.05$ ,  $p=.169$ ).

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<sup>12</sup> We note that these effects are from the policy experiment sample, hence not directly comparable to treatment effects from the mechanism experiment, which only included a subsample of villages.

However, some marginal improvements in social support were observed in both conditions ( $d_{PI}=0.09$ ,  $SE=0.05$ ,  $p=.057$ ;  $d_{II}=0.09$ ,  $SE=0.05$ ,  $p=.077$ ).

On an exploratory basis we assess which variables contributed to the observed effect on the composite index in the Interpersonal Initiative condition. There, we see significant improvements in women's relationship dynamics with their households ( $d_{II}=0.10$ ,  $SE=0.04$ ,  $p=.021$ ) and directionally but not significant improvements in dynamics with their partners ( $d_{II}=0.08$ ,  $SE=0.05$ ,  $p=.102$ ). Specifically, women in the Interpersonal Initiative condition rated themselves as feeling closer to their households ( $\beta=0.11$ ,  $SE=0.04$ ,  $p=.008$ ).

These positive impacts on household dynamics are also consistent with observed positive impacts on household businesses in the Interpersonal Initiative condition. For a randomly selected subsample of households (approximately one-fifth,  $N=457$ ), we were able to collect data on off-farm businesses owned and managed by other members of the household, in addition to those owned by women participants (Table S8). Among women assigned to the Interpersonal Initiative intervention, those household-owned businesses showed greater business outcomes overall ( $d_{II}=0.30$ ,  $SE=0.13$ ,  $p=0.023$ ), including business engagement ( $d_{II}=0.28$ ,  $SE=0.14$ ,  $p=0.039$ ) and business performance ( $d_{II}=0.21$ ,  $SE=0.13$ ,  $p=0.099$ ). For instance, while those in the control condition saw revenues of household business amounting to approximately US\$70 PPP in the past month and those in the Personal Initiative intervention saw revenues of US\$83 PPP ( $SE=21.56$ ,  $p_{PI}=.527$ ), those in the Interpersonal Initiative intervention saw revenues of US\$111 PPP ( $SE=24.53$ ,  $p_{II}=.093$ ).<sup>13</sup> Although directionally positive, no significant effect on household-owned businesses was observed among households in which women were assigned to Personal Initiative intervention (business omnibus index:  $d_{PI}=0.19$ ,  $SE=0.13$ ,  $p=0.142$ ).

Responses to one question in the Interpersonal Initiative intervention may help explain why household-owned businesses also grew in that condition. As part of the guided exercise, women were asked about strategies for navigating conflict in the household and maintaining harmony, as follows: "If a woman's husband was resistant to her engagement in business, what would you advise her to say to her husband?". One woman responded, for instance, "I would advise her to negotiate with her husband and explain to him the advantages of business development for the education of their children and the well-being of their household." This suggests that this intervention condition helped women become better equipped to engage in negotiated agency (Adjei, 2019), building shared aspirations with their husbands and family members and possibly inspiring them to engage in more economic activity as well.

Notably, while there was some evidence that the Interpersonal Initiative intervention led to an increase in other household members' economic activity, there was no evidence that either agency intervention affected other aspects of how women ran their business. For instance, women were no more likely to be more collaborative in their businesses in the Interpersonal or Personal Initiative condition. In the control condition, on average women worked with 0.24 other people outside the household on their business, and this did not differ in either intervention condition ( $\beta_{PI}=0.04$ ,  $t(2474)=0.95$ ,  $p=.342$ ;  $\beta_{II}=-0.12$ ,  $t(2474)=-0.29$ ,  $p=.772$ ).

The Personal Initiative intervention did not have a significant effect on other relational outcomes, nor did the Interpersonal Initiative intervention affect relational outcomes related to women's relationship to their broader community, including social standing ( $d_{PI}=0.03$ ,  $SE=0.05$ ,  $p=.527$ ;  $d_{II}=0.05$ ,  $SE=0.05$ ,  $p=.318$ ), or social cohesion ( $d_{PI}=-0.05$ ,  $SE=0.05$ ,  $p=.300$ ;  $d_{II}=0.00$ ,  $SE=0.05$ ,  $p=.982$ ). In addition, there was no effect of either intervention on women's control

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<sup>13</sup> Monetary amounts are PPP-adjusted USD terms, set at 2016 prices and deflated using Niger's CPI published by the World Bank. In 2016, 1 USD = 242.553 XOF PPP.

over household decision-making ( $d_{PI}=-0.02$ ,  $SE=0.05$ ,  $p=.627$ ;  $d_{II}=-0.03$ ,  $SE=0.05$ ,  $p=.584$ ), in line with null results on this outcome in the larger policy experiment.

**Table 2. Impacts of Personal and Interpersonal Initiative Interventions on Intrapersonal and Relational Outcomes in Mechanism Experiment at Endline**

		Personal Initiative	Interpersonal Initiative
(1)	(2)	(3)	(4)
Outcome	df	Coefficient (SE) Robust $p$ -value Cluster robust $p$ -value	Coefficient (SE) Robust $p$ -value Cluster robust $p$ -value
<b>Psychosocial Composite Index</b>	<b>2487</b>	<b>0.10</b> <b>(0.05)</b> <b>0.043*</b> <b>0.062†</b>	<b>0.12</b> <b>(0.05)</b> <b>0.015*</b> <b>0.032*</b>
<b>Intrapersonal Composite Index</b>	<b>2487</b>	<b>0.13</b> <b>(0.05)</b> <b>0.004**</b> <b>0.011*</b>	<b>0.12</b> <b>(0.04)</b> <b>0.010*</b> <b>0.025*</b>
Well-being	2487	0.09 (0.05) 0.049* 0.069†	0.08 (0.05) 0.089† 0.096†
Self-Efficacy	2473	0.09 (0.05) 0.068† 0.093†	0.02 (0.05) 0.595 0.643
Future Expectations	2473	0.12 (0.05) 0.019* 0.058†	0.15 (0.05) 0.002** 0.012*
<b>Relational Composite Index</b>	<b>2487</b>	<b>0.05</b> <b>(0.05)</b> <b>0.338</b> <b>0.344</b>	<b>0.09</b> <b>(0.05)</b> <b>0.075†</b> <b>0.128</b>
Partner Dynamics	2226	0.07 (0.05) 0.169 0.181	0.08 (0.05) 0.102 0.157
Household Dynamics	2487	0.03 (0.05) 0.458 0.507	0.10 (0.04) 0.021* 0.045*
Decision-Making	2473	-0.02 (0.05) 0.627 0.578	-0.03 (0.05) 0.584 0.613

Social Standing	2473	0.03	0.05
		(0.05)	(0.05)
		0.527	0.318
		0.582	0.394
Social Support	2487	0.09	0.09
		(0.05)	(0.05)
		0.057†	0.077†
		0.114	0.125
Social Cohesion	2473	-0.05	0.00
		(0.05)	(0.05)
		0.300	0.982
		0.361	0.985

Note: Columns 3 and 4 are obtained from regressions comparing the Personal Initiative and Interpersonal Initiative conditions, respectively, to the control condition. Point estimates represent the effect of each psychosocial intervention condition compared to control in terms of standard deviations (standardized to the control condition). Regressions control for randomization strata, and standard errors are robust. † $p < .10$ , \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ .

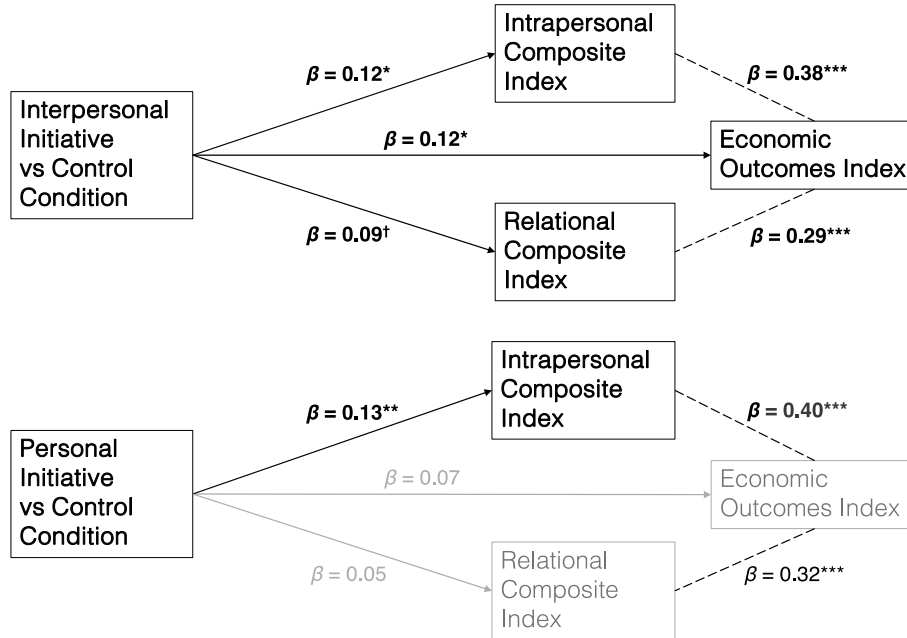
**Mediation.** We consider the causal economic impacts of the agency interventions in this mechanism experiment as our primary evidence of mechanisms. However, we also assess correlational support for certain intrapersonal and relational processes measured at baseline. We ran mediation models using 1,000 bootstrapped simulations (Tingley et al., 2014) with the subset of intrapersonal and relational variables that showed significant treatment effects from one or both of the Initiative interventions. Table S9 shows the resulting indirect effect estimates for the intrapersonal and relational composite indices.<sup>14</sup>

The results illustrate three main points. First, both intrapersonal processes (e.g., future expectations) and relational processes (e.g., household dynamics) predicted the economic composite index (i.e., business engagement, business performance, and food security), controlling for condition. Second, results are consistent with a model in which the Initiative interventions influenced economic outcomes through intrapersonal outcomes, based on significant indirect effects (IE) on the intrapersonal composite index ( $IE_{PI} = 0.05$ , 95% CI [0.01, 0.09],  $IE_{II} = 0.04$ , 95% CI [0.01, 0.07]). Specifically, evidence is strongest for the mechanism of raised future expectations, given that this variable showed significant indirect effects for both interventions ( $IE_{PI} = 0.04$ , 95% CI [0.01, 0.07],  $IE_{II} = 0.04$ , 95% CI [0.01, 0.07]). Third, only in the Interpersonal Initiative intervention was there evidence for relational mechanisms, given a marginally significant indirect effect on the relational composite index ( $IE_{II} = 0.03$ , 95% CI [0.00, 0.06], and not in the Personal Initiative intervention ( $IE_{PI} = 0.01$ , 95% CI [-0.01, 0.04])). Improved household dynamics (e.g., perceived closeness) was a possible candidate for a mechanism of those measured, given it showed significant treatment effects from the Interpersonal Initiative intervention, and indeed the indirect effect estimate was significant in this condition ( $IE_{II} = 0.02$ , 95% CI [0.00, 0.04]) and not in the Personal Initiative condition ( $IE_{PI} = 0.00$ , 95% CI [-0.01, 0.02]).

While it is not possible to infer the direction of causality among outcomes given their simultaneous measurement, Fig. 6 shows a pattern of positive treatment effects and correlations

<sup>14</sup> We used the ‘mediation’ package in R. The indirect effect represents the amount of the treatment effect of the intervention on the economic outcome index that is accounted for by the mediator. Formally, it is the product of the treatment effect on the mediator (“a” path, see Table 2 and Table S9) and the correlation between the mediator and economic outcome index controlling for treatment condition (“b” path, see Table S9). All regressions control for covariates.

among improvements in intrapersonal processes, relational processes, and economic outcomes in the Interpersonal Initiative condition. By contrast, while the Personal Initiative intervention significantly improved intrapersonal processes, it did not produce a significant effect on relational processes nor on final economic outcomes.



**Fig. 6.** Exploratory Associations Among Intrapersonal and Relational Processes and Economic Outcomes in the Personal and Interpersonal Initiative Interventions in the Mechanism Experiment

Beta estimates along the solid lines (i.e., those stemming from the intervention condition box) represent causal treatment effects. Beta estimates along the dotted lines represent correlations among the outcome measures, controlling for condition. All beta estimates are standardized to the control condition and standard errors are cluster robust. Relationships that are not significant at the  $p < .10$  level are in grey. † $p < .10$ , \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ .

Together, these results suggest that one reason that the Interpersonal Initiative intervention may have significantly improved economic outcomes while the Personal Initiative condition did not was because the Interpersonal Initiative intervention affected both intrapersonal outcomes and some relational factors while the Personal Initiative influenced intrapersonal outcomes alone. For women in this more interdependent context, intrapersonal processes and motivation may be necessary but not sufficient to induce real-world changes in economic outcomes. These results suggest that the Interpersonal Initiative intervention effectively built upon an expanded conceptualization of agency, one accounting both for intrapersonal and relational sources of motivation and action, and in this way may have better matched the type of agency that women could functionally exert to improve their circumstances.



## 6. Discussion

Amartya Sen (2000) argued, “Freedoms are not only the primary ends of development, they are also among its principal means” (p. 11). We find evidence that expanding the agency and related psychosocial freedoms of people in poverty can support poverty reduction, in addition to being a valuable goal in itself. Specifically, psychosocial interventions can support people to successfully seize the opportunities offered by poverty reduction programs to achieve their aspirations for themselves, their families, and their communities.

Our findings contribute to multiple strands of the literature. By illustrating the positive impacts of adding psychosocial interventions to poverty reduction policies, this research offers complementary causal evidence on the multi-dimensionality of poverty (Banerjee, Duflo, Goldberg, et al., 2015, Bossuroy et al., 2022). Specifically, it suggests that social-psychological barriers—including intrapersonal barriers like a diminished sense of agency to achieve a better future and relational barriers like limited social capital and influence—can impede poverty reduction. Here, we disentangle the role of specific social-psychological processes relating to intrapersonal beliefs (e.g., self-efficacy) and relational affordances (e.g., social standing) and the role of culture in shaping their relative influences on economic development.

Specifically, we build on the cultural match hypothesis to investigate the power of integrating culturally specific models of agency into the design of wise social-psychological interventions. Our findings suggest that agency interventions will be most effective in advancing economic development when they account for the cultural and social contexts in which people live. In the present cultural context of rural Niger, Study 3 showed that the intervention that significantly advanced economic development reflected a model of agency that was grounded in interdependence with others. It attended to shared aspirations with family and community and to social harmony and respectfulness in goal pursuit, and it enabled women to build relational affordances, such as social capital and social influence, in addition to boosting intrapersonal beliefs like self-efficacy. This stands in contrast to an agency intervention based on independence—specifically self-initiative and self-advancement—which boosted intrapersonal beliefs but showed limited effects on economic outcomes and relational affordances.

These findings also contribute to the diversification of the social and behavioral sciences by illustrating cultural phenomena in one of the most under-studied populations—low-income, rural Nigeriens. Specifically, it reveals the centrality of interdependent motives like social harmony and respect to models of agency, and thus elucidates a variety of interdependence that exists in this region (Kitayama et al., 2022). Moreover, we illustrate methods for identifying important cultural features. For instance, Study 1 demonstrated how specific qualitative and quantitative methods can be used to reveal local models of agency and their relationships to the opportunities and social systems in which people live. In Studies 2 and 3, we showed how these models of agency can be factored in to design culturally wise interventions and capture quantitative psychosocial measures to track possible mechanisms.

Future research in psychology may answer additional questions about specific social-psychological processes driving economic behavior across different cultural contexts. Large-scale, cross-cultural comparisons of independence- and interdependence-grounded interventions across diverse populations can help determine the relative effect sizes of these interventions and their relationship to underlying models of self and agency. For instance, given that many outcomes in Study 3 did not significantly differ between the interdependence- and independence-oriented interventions, such large-scale, cross-cultural experiments may determine if these

interventions produce equivalent effects to each other across populations, whether one generally is more effective than the other across populations, or whether culture match matters, i.e., an interdependence-oriented intervention is more effective among more interdependent populations and independence-oriented interventions among more independent populations. Given that models of self and agency have been found to vary across nations (e.g., the East and the West) (Kitayama et al., 2022) and within nations (e.g., across social class, gender) (Stephens et al., 2012), these comparisons could be made both within and across cultural contexts. Future studies may also expand the set of social-psychological measures beyond those developed in Western contexts in order to capture new constructs and processes that may be important to understand models of agency and pathways out of poverty in diverse cultural contexts. Answering such questions would help clarify the role of culture in shaping responsiveness to different psychological and behavioral science interventions and the mechanisms through which these interventions operate.

From a policy perspective, our results showcase low-intensity social-psychological interventions as powerful and practical components of social protection and other anti-poverty policies. We show how addressing social-psychological constraints can be accomplished with interventions at the community, group, and individual levels that range from 30-minute one-on-one sessions to a community event to 1-week group training. Moreover, these interventions are highly cost-effective, including compared to approaches that mostly deliver economic support (Bossuroy et al., 2022). Future policy-oriented research may seek to understand the minimal set of psychosocial and economic interventions that resource-constrained governments can use to produce the most cost-effective and sustained impacts on poverty reduction and welfare at scale. The present research suggests that agency-based psychosocial interventions tailored to cultural context may be an important part of such multi-faceted interventions.

Together, these findings show the promise of an emerging area of research at the intersection of behavioral science, cultural psychology, and development economics. Over 90% of social science research is based on high-income, individualistic Western populations who represent a minority of the global population (Henrich, 2020; Henrich et al., 2010; Markus & Conner, 2014; Thalmayer et al., 2021). Our findings suggest that, while psychological and behavioral sciences hold great promise in helping address pressing challenges like extreme poverty in low- and middle-income countries, their potential may be limited by a Western, independent default (Thomas & Markus, 2023). Here, however, we show that combining the insights of behavioral science, the lens of cultural psychology, and the evidence-based approach of development economics can lead to innovative interdisciplinary solutions for tackling complex global problems like poverty and inequality across diverse cultural contexts.

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**Acknowledgments** The studies presented in this paper were collaborations between the Niger Safety Nets Unit, the World Bank Sahel Adaptive Social Protection program, and Stanford SPARQ. The studies were co-funded by the Sahel Adaptive Social Protection Program (TF0A2522, TF0B2819, TF019115) at the World Bank, the Wellspring Philanthropic Fund (TF0A5780, 6120) and the Niger Adaptive Safety Nets Project (P166602), managed by Cellule Filets Sociaux (CFS) in the Niger Prime Minister's office. We would like to thank staff from Cellule Filets Sociaux within the government of Niger, the Sahel Adaptive Social Protection Program, and Sahel Consulting (led by Adamou Hamadou) for intervention and research implementation; all research collaborators on the policy experiment, including Markus Goldstein, Bassirou Karimou, Dean Karlan, Harounan Kazianga, William Parienté, Christopher Udry, Julia Vaillant, and Kelsey Wright; Damel Dieng for production of the film; Constant Tonakpa for illustration; and Ellen Reinhart and Yazen Kashlan for outstanding research assistance. For their feedback, we thank members of the Dweck-Walton Lab and Culture Collaboratory at Stanford University, Carol Dweck, Claude Steele, Geoffrey Cohen, Marcel Fafchamps, and Erik Santoro, as well as participants in the Dublin Trinity graduation conference and the UC Berkeley Psychology and Economics of Poverty (PEP) Initiative. All findings, interpretations, and conclusions in this paper are those of the authors and do not necessarily represent the views of the World Bank or the government it represents.

**Author contributions** C.C.T. led the design of psychosocial interventions, development of psychosocial measures, designs of Study 1 and 3, analysis of all studies, and manuscript writing. P.P. and T.B. led RCT design for Study 2, contributed to designs of Study 1 and 3, contributed to analysis for Studies 2 and 3 and to manuscript writing. S.A.S. contributed to the development of psychosocial measures and intervention design. H.M. and G.W. contributed to design of psychosocial interventions, development of psychosocial measures, analysis, and manuscript writing.

**Competing interests** This study was co-financed by the Sahel Adaptive Social Protection Program at the World Bank and Niger Adaptive Safety Nets Project managed by CFS in the Prime Minister's office of the Niger Government. The authors declare the following competing interests: T.B. and P.P. work for the World Bank.

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## Supplementary Materials

### Appendix A: Methods

#### Study 1: Descriptive Findings: Agency in Context

##### *Descriptive Surveys in Niger*

*Participants.* This data was from surveys collected among the full policy experiment sample at baseline (N=4,717) or otherwise from respondents assigned to the control group at the six-month follow-up (N=1,216). The reason for the latter choice was to obtain responses unaffected by the additional psychosocial interventions. The policy experiment sample is described in section ‘Study 2—Policy Experiment’ below.

*Procedure.* For the descriptive data on models of agency, we explored women’s understanding of drivers of and barriers to economic success through two questions asking them to rank four factors in order of their importance as drivers of women’s economic success and as barriers to women’s economic success. For both questions, two options were more independent factors taken from Western goal setting and entrepreneurial interventions (Campos et al., 2017). For the drivers of success question, these included “having self-initiative” and “hard work” and for the barriers question, these included “not planning for the future” and “not being persistent.” Other factors were derived from qualitative interviews. For the question on drivers, the options included “peacefulness” and “good social connections,” and for the question on barriers, these included “not respecting others” and “tension in the household.” In the question on drivers, participants were asked “of these 4 factors, which is the most necessary for the success of women in their economic activities?” and then asked to rank the subsequent qualities. The four options were: working hard, having peacefulness, showing personal initiative and being strategic, and having good social connections. For the question on barriers, participants were asked “of these 4 factors, which is the main reason for which women do not succeed in their economic activities?” and then asked to rank the subsequent qualities. The four options were: not respecting others, not persevering in the face of obstacles, having tension in the household, and not having a plan for the future.

*Empirical strategy.* These analyses were not pre-registered as these measures were exploratory and descriptive in nature.

##### *Predictions study in the U.S.*

As a point of cultural comparison, we collected predictions of our Nigerien sample’s responses on models of economic agency by U.S. participants through an online convenience sample ex post.

*Participants.* We recruited 302 respondents based in the U.S. from CloudResearch’s MTurk Toolkit platform to take a descriptive survey. The sample was on average middle income, with the modal annual household income being \$40,001-\$60,000; 57.6% identified as male, 41.7% as female, and 0.7% self-described; 42.4% had a 4-year college degree and 20.9% had some

college; 70.9% identified as White, 12.9% as Black, 5.3% as Asian, and 4.6% as Hispanic. On a 7-point scale of political ideology (1=Strongly liberal to 7=Strongly conservative), the sample scored on average 3.14 (SD=1.78).

*Procedure.* We explained to participants that “The following questions ask for your predictions about the economic success of low-income women in the context of Niger.” They were asked “Of these 4 qualities, which do you predict will be the most important for women's economic success in this context?” and were asked to rank order four options: working hard, having peacefulness, showing personal initiative and being strategic, and having good social connections. They were also asked “Of these 4 reasons, which do you predict will be the most important for why women are not economically successful in this context?” and were asked to rank order four options: not respecting others, not persevering in the face of obstacles, having tension in the household, and not having a plan for the future. They were also asked to make several other predictions.

*Empirical strategy:* These analyses were not pre-registered as this study was exploratory and descriptive in nature.

## **Study 2: Policy Experiment**

The methodology for treatment effect analysis and construction of measures were pre-registered in the AEA RCT registry: <https://www.socialscienceregistry.org/trials/2544>. The study received approval from the Innovations for Poverty Action Institutional Review Board (#00006083).

*Participants.* Women from low-income households in predominantly rural areas of Niger. Individuals were eligible for participation in the multi-faceted productive inclusion components of the Sahel Adaptive Social Protection (ASP) program on the basis of a Proxy Means Targeting (PMT) score and other methods seeking to identify poor and vulnerable households.<sup>15</sup> Full details can be found in Bossuroy et al. (2022).

*Treatments.* A summary and additional details are as follows. The multi-faceted productive inclusion components of the Sahel Adaptive Social Protection program were targeted to women in low-income households to encourage and support them in expanding and diversifying micro-enterprises, which is a primary pathway for reducing poverty and food insecurity in this highly climate-affected region. The design of the program was multi-faceted, including various economic components such as regular cash transfers, savings groups, coaching, and business trainings. It also tested innovative psychosocial programming, such as media to role model success in the program, community-wide discussions to shift gender norms, and life skills trainings. Full details can be in Bossuroy et al. (2022) Supplementary Information.

The community sensitization was designed to introduce participating communities to the program. Both the film and discussion prompted a construal of women’s micro-entrepreneurship, a target outcome of the program, as a way to advance local values of social harmony, respect, and generosity. The 20-minute film modeled the story of a woman named Amina starting a new micro-enterprise and overcoming economic and interpersonal challenges as she strives toward

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<sup>15</sup> The selection process is detailed here: <http://documents.worldbank.org/curated/en/387791524060631076/pdf/WPS8412.pdf>.

greater economic security. In the end, she shares her learnings with other women in her village and uses her own economic success to support her children's schooling and her husband's business as well. A subsequent moderated discussion prompted members of the community to articulate how Amina's story, and women's micro-entrepreneurship more broadly, may align with their goals and values. It also prompted the audience to set collective aspirations for the next generation and to identify coordinated behaviors that would advance those aspirations (Lewin, 1952). This event was conducted with the approval of the village chief. Village elders, religious leaders, and economic leaders were also invited as community members who would likely have influence over women successfully becoming micro-entrepreneurs. Program beneficiaries were also encouraged to invite their husbands, family members, and friends, i.e., people who could provide them instrumental and socioemotional support.

The 1-week life skills training was conducted in groups of approximately 20 women who came together to learn skills like goal setting and planning, decision-making, problem-solving, interpersonal communication, and leadership. In addition to teaching practical skills, these training sessions were intended to build women's sense of self-worth, confidence, and both independent and interdependent agency. Women were also prompted to identify their values and their strengths as well as discuss their roles in and contributions to their families and communities. The same film from the community sensitization was used in several training sessions to role model the exercise of different life skills and link these skills to community values and contributions. The pedagogy of these trainings was grounded in participatory, problem-centered, personalized learning.

According to administrative data, attendance rates of beneficiaries at the community sensitization events was 89.3%. Attendance rates of beneficiaries in the life skills trainings was 93.8%, and 85% completed at least five of six sessions offered. According to administrative data collected in a subset of villages, the entire sensitization lasted approximately 1.5 hours on average, approximately 250 people attended the sensitization per village, and village chiefs and imams were consistently present. Approximately 18% - 30% of beneficiaries in attendance saw the film with their husbands and 31% with their children. Approximately 87% of beneficiaries in the psychosocial arms reported remembering the film's protagonist Amina in the follow-up survey.

### *Measures*

The following description of measures is adapted from Bossuroy et al. (2022) Supplementary Information.

*Economic outcomes.* *Consumption* was used as a proxy of poverty. It assessed total daily consumption per adult equivalent, which is the sum of daily household food and non-food consumption as well as expenditures on education, health care, and celebrations, divided by the number of adult equivalents per household. *Food security* is assessed with the Food Insecurity Experience Scale (FIES) (Ballard et al., 2013), which asks eight yes/no questions about a household's food security over the last year where 0 = "yes" and 1 = "no" and we present a raw sum. The questions are "have you or other members of your household 1) been worried about not having enough food, 2) been unable to eat nutritious and healthy foods, 3) had to eat a smaller variety of foods, 4) had to skip a meal, 5) eaten less than they thought they should, 6) run out of food, 7) been hungry but did not eat, and 8) gone an entire day without eating?"

*Women's business revenues* are computed from questions about revenue generated in the last month in which a business was operational, and we ask for the number of operational months in the last year. We winsorize revenues at the business-level at the 98th percentile. To get yearly amounts, we multiply this monthly revenue by the number of months a business was in operation in the last 12 months. To get the beneficiary's share, we divide revenues by the number of co-owners and we sum across all beneficiary-owned/managed businesses.

*Intra-personal psychosocial outcomes. Mental health* (17 items,  $\alpha = .82$ ) included CESD-R-10, a depression screener designed for community samples; functional disability items from SRQ-20; life satisfaction using an adapted Cantril ladder; sense of inner peace; and self-assessed mental health. Disability items, assessing somatic symptoms and role functioning, and self-assessed mental health item were included to capture cultural differences in mental illness symptoms (e.g., somatization) and functional impairments (Thomas et al., 2016; Ali et al., 2016). Inner peace was considered a culturally specific indicator of well-being, according to qualitative piloting and West African studies (Osei-Tutu et al., 2020).

*Self-efficacy* (8 items,  $\alpha = .76$ ) captured judgments of one's capabilities, specifically in relation to problem solving, goal pursuit, and coping, and a related self-esteem question. Self-efficacy has been found to be a motivational keystone, particularly of goal setting and pursuit (Bandura, 1997) and theorized as a driver of economic development (Wuepper & Lybbert, 2017). *Future expectations* (3 items,  $\alpha = .76$ ) gauged expectations for personal and intergenerational socioeconomic status as well as life satisfaction in the future, through adapted MacArthur ladders. Notably, hope, or positive expectations for the future, has been posited to contribute to graduation programs' effects on poverty reduction (Duflo, 2012).

*Relational psychosocial outcomes.* The relational psychosocial outcomes were seen as potential determinants of women's economic outcomes in the low literacy, low resource, and normatively tight study setting where women's opportunities often come through their relationships and where reciprocal networks of support can be critical to cope with shocks (Woolcock and Narayan, 2000; Akyeampong et al., 2014). Moreover, relational well-being is often integral to individual happiness and wellbeing among interdependent groups (Hitokoto and Uchida, 2015; Osei-Tutu et al., 2020).

*Financial support* (3 items,  $\alpha = .26$ ) and *social support* (6 items,  $\alpha = .66$ ) assessed women's level of social capital (Woolcock and Narayan, 2000). Financial support assessed the extent of one's financial support network, based on perceived ability to receive financial help in times of need and number of financial supporters. Social support assessed the extent of one's instrumental support network, based on the number of relationships one has for acquiring information, advice, and opportunities. Together, these questions capture whether beneficiaries are able to develop informal systems of support for economic resilience and opportunity.

*Social standing* (4 items,  $\alpha = .75$ ) assessed the MacArthur socioeconomic status ladder and three context-specific ladders of community standing: being respected, having one's opinion followed, and showing moral behavior. Such self-assessments of one's social position have been found to predict health, well-being, and feelings of financial security, above and beyond income (Operario et al., 2004).

*Social norms* (8 items,  $\alpha = .55$ ) assessed descriptive and prescriptive norms supportive of women's economic engagement. The *descriptive norms* sub-index (4 items,  $\alpha = .55$ ) assessed perceptions of other women in the village engaging in economic activities, such as starting new

activities, becoming vendors, and traveling outside the village. The *prescriptive norms* sub-index (4 items,  $\alpha = .61$ ) assessed perceptions of other men and women believing that women *should* engage in, i.e., social approval versus censure of, such activities.

*Social cohesion and community closeness* (9 items,  $\alpha = .47$ ) assessed social interdependence and collectivism, expectations of social support, feelings of trust and closeness, experienced tension (reversed), and number of enemies (reversed). Interdependence and collectivism items measure how individuals view themselves in relation to others, i.e., as similar, connected, and responsive versus separate, unique, and autonomous; they reflect culturally-specific forms of motivation that were integrated into the design of the psychosocial interventions. Additionally, the number of enemies, or people who wish to sabotage your success, was included as a locally relevant indicator of social cohesion (Adams, 2005), particularly given that enemies can arise from envy and resentment following inequalities in new economic opportunities or resources.

*Collective action* (5 items,  $\alpha = .34$ ) assessed community engagement and support through the number of groups belonged to, the number of leadership positions held, monetary and volunteer contributions to community projects, and self-reported collective initiative. This measure assessed women's engagement in community leadership as well as the potential of the interventions to create indirect benefits to communities.

*Intra-household dynamics* (6 items,  $\alpha = .33$ ) assessed perceived quality of intra-household relationships with one's partner (3 items,  $\alpha = .09$ ) and one's household (3 items,  $\alpha = .25$ ). Items included feelings of trust, closeness, and support as well as experienced conflicts (reversed). Given that many economic and behavioral decisions are made at the household level in the study setting, this measure gauged the extent to which beneficiaries felt aligned with and supported by members of their household in decision-making or experienced tensions (reversed). It also assessed the Inclusion of Other in Self visual scale and sense of trust as indicators of intra-household closeness and positive relationality (Aron et al., 1992).

### **Study 3: Mechanism experiment**

This study was pre-registered in the AEA RCT registry:

<https://www.socialscienceregistry.org/trials/3570>. It received approval from Stanford University Institutional Review Board (#44074).

*Participants.* The study includes 2,628 women in 33 villages across six communes (see Appendix B for a map of the commune locations). Study respondents were recruited from the pool of program recipients in villages assigned to the Psychosocial and Full arms of the policy experiment, i.e., those program modalities that included psychosocial components. Women participants were from low-income households within each village. Eighty-five percent of these households were found to fall below Niger's national poverty line (Bossuroy et al., 2022). Women in this sample were on average 34 years old ( $SD=14.11$ ) and had 0.64 years of education ( $SD=1.97$ ). The average household size was 9.54 members ( $SD=4.64$ ). Most participants were not heads of their household (88%) and were not nomadic (89%). The average distance to the nearest market from each village was 73 minutes ( $SE=3.52$ ) and to the nearest water source was 12 minutes ( $SE=1.14$ ). Among those who participated in the endline survey, a minority (16%) of women respondents owned a personal cellphone. While religious identification was not asked, a vast majority of Nigeriens practice Islam.

*Randomization strategy.* We randomized 1,332 participants to one of two brief psychosocial motivational interventions (“personal initiative” or “interpersonal initiative”, n=666 per group) and 1,296 to a control condition. These randomizations were stratified by timing of the delivery of the main multi-faceted ASP program components (Early: February-March / Late: April), the policy experiment treatment arm (Full: all components / Psychosocial: all components except a one-off cash grant), and participation in the policy experiment baseline survey (Y/N). Randomization of the intervention occurred at the individual level. However, women participants in the multi-faceted ASP program were organized into groups for other program activities (e.g., skills trainings, savings associations). On top of the individual-level randomization, we included a group-level randomization, such that those groups were assigned to have to have 25% (n=36 groups), 50% (n=36 groups), 75% (n=36 groups) of their group members treated with either psychosocial intervention. These groups had between 11 to 33 women participants, with an average of 25.

Randomization produced well-balanced conditions on pre-registered key sociodemographic variables, including a poverty proxy score, age, nomad status, living in a hamlet outside the village versus inside the village, and household head status, as well as randomization strata (see Table S4). Note that randomization was not balanced on the randomization stratum of participation in the policy experiment trial and that all analyses control for this variable, as with other randomization strata variables. Response rates in the endline survey were high overall, with 95% of the sample participating. Attrition was minimal in magnitude with 5% (N=135) lost to follow-up (see Fig. S2). However, attrition was marginally differential across conditions: 5.7% (N=74) in the control, 6.0% (N=40) in Personal Initiative, and 3.2% (N=21) in Interpersonal Initiative condition. According to a logistic regression controlling for stratification variables and applying robust standard errors, those in the Interpersonal Initiative condition were less likely to show attrition than those in the control condition ( $\beta = -0.52, p=0.038$ ) but attrition did not differ between the control and Personal Initiative conditions ( $\beta = 0.16, p=0.446$ ). Attrition was associated with older age ( $\beta = 0.01, p=0.025$ ) and with status as head of household ( $\beta = 0.50, p=0.030$ ). Table S5 presents full analyses. Table S7 presents robustness analyses which show that patterns of results on economic and psychosocial outcomes remain the same when controlling for these two variables of age and status of head of household.

*Statistical power.* The study was powered for a minimum detectable effect (MDE) size between the psychosocial treatment (pooled) and the control condition of Cohen’s  $d$  of 0.11. This target MDE required n=1,228 for the two psychosocial intervention arms and n=1,296 for the control arm, before adjusting for control variables. Assuming a rate of 8% for non-participation, survey error, and attrition, our target sample size was N=1,332.

### *Treatment Conditions*

The experiment was conducted after a community event designed to introduce villages to the multi-faceted ASP poverty reduction program, which consisted of a 20-minute film and

community discussion.<sup>16</sup> That film depicted the story of a role model named Amina and was shown to all participants in the present study sample. In the film, Amina was shown to become a successful entrepreneur through her initiative—both her exercising self-direction and planning and through reaching out to her family and peers for support and solidarity. We then randomized participants to a control condition or one of two psychosocial interventions that reinforced different interpretations of behavior modeled in that film.

These interventions comprised a four-minute video recap of Amina’s story and a 20-minute reflection exercise relating the role model’s story to participants’ own economic goals and behaviors (see Fig. 4 for example images from the video). In the first “personal initiative” condition, the recap portrayed the main character Amina as becoming a standout entrepreneur by being proactive in planning her business goals, innovative in her choice of products, and strategic and competitive in the marketplace. Then, participants completed a motivational exercise that was adapted from an evidence-based exercise developed and tested in Western populations called “mental contrasting and implementation intentions” (Duckworth et al., 2013; Kizilcec & Cohen, 2017; Oettingen & Gollwitzer, 2010). This exercise prompted participants to set goals and identify intrapersonal and structural resources and barriers as well as ways to overcome those barriers. They were asked, for instance, “What changes would you like to see for your future?”, “What could stand in the way of your goals?”, and “How could these obstacles be overcome?”.

In the second “interpersonal initiative” condition, the recap portrayed the main character Amina as becoming a respected entrepreneur in her community by actively seeking counsel from her elders on developing her businesses, collaborating with her husband in decision-making, and being generous with other women in her community by sharing her financial knowledge. In this way, she maintained peaceful relationships. Participants then completed a motivational goal-setting and planning strategy but one that was modified to focus on relational goals, barriers, and social strategies. For instance, after being asked about their goals for their future, women were asked, “How would these goals help your family and village?”, “How do women help each other in this community?”, and “If you experienced conflicts with others, who could you talk to for advice and encouragement?”. Across both videos, Amina was shown to develop a successful business and her capabilities were highlighted, yet her goals for those actions and the processes she employed to achieve those goals varied. Videos were matched on all other characteristics where possible, including character depictions, features of the scenes, choice of business, etc.

### *Data collection*

During these individual-level sessions, participants were guided by female enumerators through one of these two psychosocial interventions. The intervention video was displayed on tablets followed by a series of prompts asked by the enumerator, which together lasted approximately 30 minutes. Enumerators recorded summaries of participants’ qualitative responses to the intervention. Enumerators then asked a series of self-reported psychosocial measures and hypothetical economic scenarios. These sessions lasted approximately 80 minutes in total and took place in a private space in the participant’s home or near their home. All

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<sup>16</sup> The film was also a launching point for a wider community discussion on community values and goals around economic development, specifically related to climate adaptation, and around the roles of women and men within economic development processes.



materials were read aloud in the participant's desired language (Haoussa or Djerma). Enumerators were blind to the hypotheses.

An endline survey was conducted approximately one year later among the full sample. Female enumerators were blind to condition assignment and administered the survey to female respondents in a private space in their homes or near their homes. Enumerators asked respondents a series of economic, psychological, social, and program-related outcome measures in the participant's desired language.

#### *Post-intervention Survey Measures.*

Responses to self-reported psychosocial measures and hypothetical economic scenarios were collected among those in intervention conditions only. Details on the wording and construction of each measure can be found on the AEA pre-registration:

<https://www.socialscienceregistry.org/trials/3570>.

Note that many of these measures were original, meaning that they were developed to be specific to this economic and cultural context. Given time constraints, we were unable to assess the properties of these measures before the survey, and several were found post-hoc to have poor properties (e.g., low internal reliability, low variation, frequent ceiling effects). While we pre-registered a split sample analytic approach due to the exploratory nature of these measures and to help control the rate of false discovery (Anderson & Magruder, 2017), we ultimately found no significant effect on any outcome measure and thus present analyses on the full sample.

***Economic outcomes.*** Three composite variables (*approach behaviors*, *approach feelings*, and *budget allocation*) comprise an 'economic composite index', which relates to business intentions and investment behaviors. *Approach behaviors* and *approach feelings* assess response to four hypothetical business decisions that relate to: reinvesting in a profitable activity following an intrahousehold disagreement, becoming a traveling saleswoman, seeking information on business development, and asking trainers for advice on their business. Different options were given for each scenario but approach behaviors were classified into binary indicators (approach/avoid). For each scenario, respondents were asked how they would feel on a 4-point scale for 4 *feelings*: confident vs. uncertain, proud vs. ashamed, generous vs. selfish, and harmonious vs. conflictual. A hypothetical *budget allocation* asked respondents about a scenario in which they had 6,500 CFA in surplus business profits and asked them how much they would invest in savings and in her business (as compared to food, school fees, community projects or other self-described purchases).

*Optimistic program expectations* asked respondents 4 prediction questions on how many out of 10 program participants would increase their profits under different scenarios and how many would attend all life skills and business training sessions.

***Social outcomes.*** Five composite variables (*social standing*, *social norms*, *social support*, *anticipation of negative reputation*, and *trust*) comprise a 'social composite index.' *Social standing* uses a 10-point ladder for 5 questions about women's current subjective social status, how well-regarded they are in their community, how much their opinion is followed and whether that will increase or decrease in the future or stay the same in the future, and how much they feel they are a person who models good moral character. *Social norms* relate to women's business activities and ask them to estimate out of 10 women how many would be supported by their

parents to become traveling saleswomen, how many of 10 would advocate for their control over their earnings in the household, and how many of 10 would be given loans if requested. *Social support* asks women on a 4-point scale how much they feel they can count on financial help from women in their savings group and to estimate out of 10 women how many would give them money if requested. *Trust* is measured with a single item “Out of 10 people in your region, how many people are good and trustworthy vs. bad and untrustworthy?”. For *anticipation of negative reputation*, participants were asked how they think they will be seen by others in their family and community as they develop their businesses and were given two open-ended response options for family and two for community. Responses were then classified by enumerators as positive, negative, or unclear, and the final variable was a binary indicator of whether they reported anticipating any negative consequences across these questions.

***Intrapersonal and Other.*** *Future expectations (SES)* was comprised of two items asking about their anticipated socioeconomic status in two years and that of their youngest child or grandchild when they become 30, both using a 10-point MacArthur ladder of subjective social status. *Self-efficacy* assessed respondent’s perceived ability to adapt to difficulties, cope with unexpected events and do things as well as most people, each on 4-point scales.

*Prosocial preferences* gave respondents two hypothetical allocation tasks. The first asked them to allocate 170,000 CFA of an NGO to community projects versus individual households. The second asked them how much of 6,500 CFA in profits they would give to fund community projects.

*Amina evaluation* assessed respondents’ evaluations of the role model displayed in the intervention materials on a 10-point scale, specifically ratings of her morality, respect, social standing, and economic mobility.

### *Endline Survey Measures.*

The endline survey assessed economic and psychosocial outcomes, both relating to personal and relational processes. The outcomes and their constructions align to the extent possible to the policy experiment, as reported in Bossuroy et al. (2022). Due to budget and logistical constraints, this endline survey was a condensed and slightly altered version of the follow-up surveys used in Study 2, i.e. the broader policy experiment. We construct composite indices across all outcomes within each domain (economic and psychosocial) in order to address multiple hypothesis testing. All outcome indices are standardized such that each index has mean 0 and standard deviation 1 for the control group (Kling et al., 2007).

***Economic outcomes.*** The *food security index* is a composite of two measures. *Household food security frequency* over the past 12 months is assessed with two items adapted from the Food Insecurity Experience Scale (FIES, e.g., having gone a whole day without food, 0=Almost every month to 4=No, never) (Ballard et al., 2013). *Dietary diversity* is captured with an abbreviated measure of the food consumption score that is a weighted sum of the number of days in the past week that the respondent has eaten vegetables and meat, where meat is given a weight of four and vegetables of one (WFP, 2008).

*Business engagement index* assesses whether the program participant had an off-farm business or not, the number of off-farm businesses owned or operated in the past 12 months and the number started in the last 12 months, the number of businesses the beneficiary intends to expand (vs maintain or abandon), the sum of days worked on all businesses in the past month, an index of self-reported healthy business practices (e.g., keeping a sales ledger), and the total value

of business assets and business investments.<sup>17</sup> *Business performance index* assesses the total value of profits and revenues across all beneficiary owned businesses.

**Psychosocial outcomes.** We measure *subjective well-being* with 14 standardized items: ten items from the CESD-R-10 depression screener (0-7 days, e.g., “Over the past seven days, how often have you felt depressed?”, *reverse-coded*), a life satisfaction item (Cantril ladder, 10-point scale), a novel measure of inner peace (10-point scale), an original measure of feeling blessed by God (1=No, definitely not to 4=Yes, definitely), and *subjective health* (1=Poor to 5=Excellent).

*Self-efficacy* is assessed with four items from the Generalized Self-Efficacy Scale (Schwarzer & Jerusalem, 1995) and one item from the Rosenberg Self-Esteem Scale (1=Not at all to 4=Yes, absolutely) (Rosenberg, 1979) which are summed and then standardized to the control condition. *Future expectations* is a single item of expected socioeconomic standing in two years, using the MacArthur Scale of Subjective Social Status (Ritterman Weintraub et al., 2015). We also construct a summary *psychological outcomes composite* across these three outcomes.

*Social outcomes.* We measure *social standing* with 3 items: the MacArthur Scale of Subjective Social Status plus two adapted such scales assessing how much respondents feel that they are respected in society and are a person of good moral character in relation to others (10-point scale). *Social and financial support* is assessed with two items asking how many people the respondent could ask for advice on their economic activity and if they experience an interpersonal conflict and an item on their perceived probability of being able to amass a small sum of money in emergencies (1=Not at all likely to 4=Very likely). *Social cohesion and community closeness* is assessed with four items: how many people out of ten in the village the respondent feels they can trust (10-point scale), how many enemies (someone who “wishes you to fail or would try to sabotage their progress”) they perceive they have (1=No one to 4=A lot), how much they feel it is their duty to sacrifice for their community even at their own expense (1=No, not at all to 4=Yes, definitely), and how close they feel toward their community (4-point scale of Inclusion of Other in Self (IOS) Scale) (Aron et al., 1992).

We assess *household decision-making* with 4 items: three capturing how much women feel that their opinion matters in decisions related to their own earnings, daily spending, and non-agricultural businesses (1=Does not matter at all to 3=Matters a lot) and whether the household has prevented the respondent from working outside the home in the last 12 months (0=Yes, 1=No). *Partner dynamics* was captured with one item assessing how close respondents feel towards their partner (4-point, IOS measure) and one item assessing how comfortable they feel telling their partner that they disagree with them (1=Never to 4=Most of the time). *Household dynamics* was captured with items assessing how close respondents feel towards their household (4-point, IOS measure), how respected they feel by their household in regards to their economic activity (1=No, not at all to 4=Yes, a lot), and how much they have experienced household tension in the last six months (1=No, not at all to 4=Yes, a lot). We construct a summary *relational outcomes composite index* across all other-oriented outcomes.

**Other.** We assess *redistributive preferences* with three items assessing sharing-oriented attitudes and behaviors (how much alms respondents have given to the less fortunate in their community in the last two months, what percentage of any extra yields would they share with

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<sup>17</sup> This index included three additional variables than those pre-registered in order to match the construction of the business outcomes index in Bossuroy et al. (2022). These included measures of the number of days worked, having a business, and healthy business practices index.

others in their community as opposed to save for themselves, and preferences for the village to develop together versus separately).

**Sociodemographics.** Most sociodemographic measures including Proxy Means Targeting (PMT) poverty score (Premand & Schnitzer, 2021), age, relationship to household head, and nomad status were collected in a census survey prior to the randomization.

### *Empirical strategy*

The analysis plans were pre-specified (<https://www.socialscienceregistry.org/trials/3570>). Deviations from this plan are also uploaded and primarily reflect changes to align analyses with the policy experiment, as published in Bossuroy et al. (2022).

To assess treatment effects at endline, our primary model compares each psychosocial intervention to a control condition that included no additional psychosocial intervention.<sup>18</sup> We control for a vector of stratification variables used in randomization, including timing of the program implementation (early versus late), policy experiment treatment arm (Psychosocial versus Full), and whether or not participants were randomly selected in the policy experiment sample for data collection (presented in Bossuroy et al., 2022). This model is represented as follows:

$$Y_i = \beta_0 + \beta_1 T.P\text{ersonal}_i + \beta_2 T.I\text{nterpersonal}_i + \gamma_0 X_i + \varepsilon_i$$

We present both robust  $p$ -values and cluster robust  $p$ -values. We present clustered standard errors to account for the fact that women were organized into groups as part of the program and thus their outcomes are likely to be correlated and because a group-level randomization was conducted on top of the individual-level randomization. However, given recent evidence (Abadie et al., 2022), these cluster robust  $p$ -values may be overly conservative. For this reason, we present both clustered and non-clustered robust  $p$  values and prioritize the latter for interpretation.

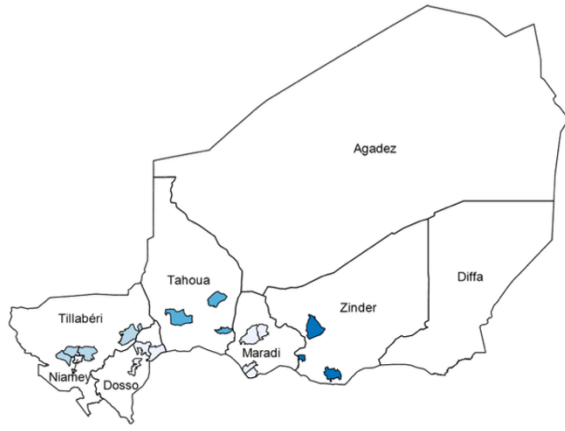
A second implication of this design is the potential for contamination of intervention content in case women were to discuss intervention with others in their program group. In this case, the differences across intervention conditions would likely be attenuated and thus can be considered conservative estimates of true intervention effects.

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<sup>18</sup> We did not pre-register analyses of differences between the two treatment arms (Personal Initiative and Interpersonal Initiative) because we believed that we could be underpowered to detect such a difference. Nevertheless, we compute the  $p$  value for comparisons between the two treatments in the supplementary appendix and find, as expected, that  $ps > .05$  across all economic and psychosocial outcomes.

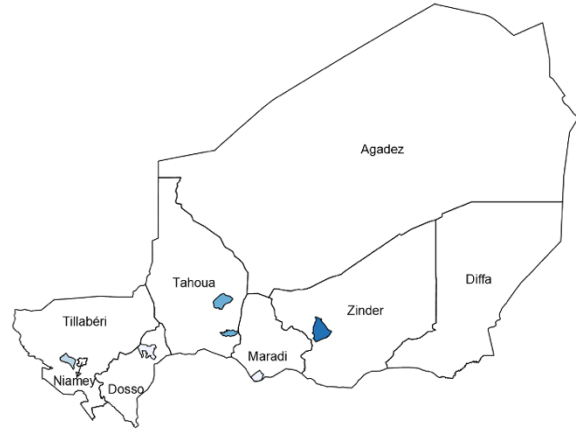
## Appendix B: Additional Figures and Tables

A. Policy Experiment Sample



Notes: Authors' creation; boundaries from OCHA Common Operational Data.

B. Mechanism Experiment Sample



Notes: Authors' creation; boundaries from OCHA Common Operational Data.

**Fig. S1:** Communes in the Policy Experiment and Mechanism Experiment samples

**Table S1.** Correlations of Psychosocial Outcomes with Women's Economic Outcomes at Follow-up 2 in the Policy Experiment

**Bivariate correlations with  
women's business revenues at  
follow-up 2**

	<i>Correlations (r)</i>
Collective Action	0.04
Social Standing	0.07*
Self-Efficacy	0.08*
Future Expectations	0.08*
Controls Earnings	0.11***
Mental Health	0.04
Social Support	0.07*
Social Norms	0.06*
Intra-Household Dynamics	0.04
Financial Support	-0.01
Social Cohesion	0.05
IPV Perceptions	0.01
Control in Household	0.08*

For these correlations, N=1054 for all indices, except N=1009 for Control in Household.

**Table S2.** Correlation Matrix Among Psychosocial Variables in Table 1 and Selected Indicators of Business Engagement Among Control group at the First Follow-up in the Policy Experiment

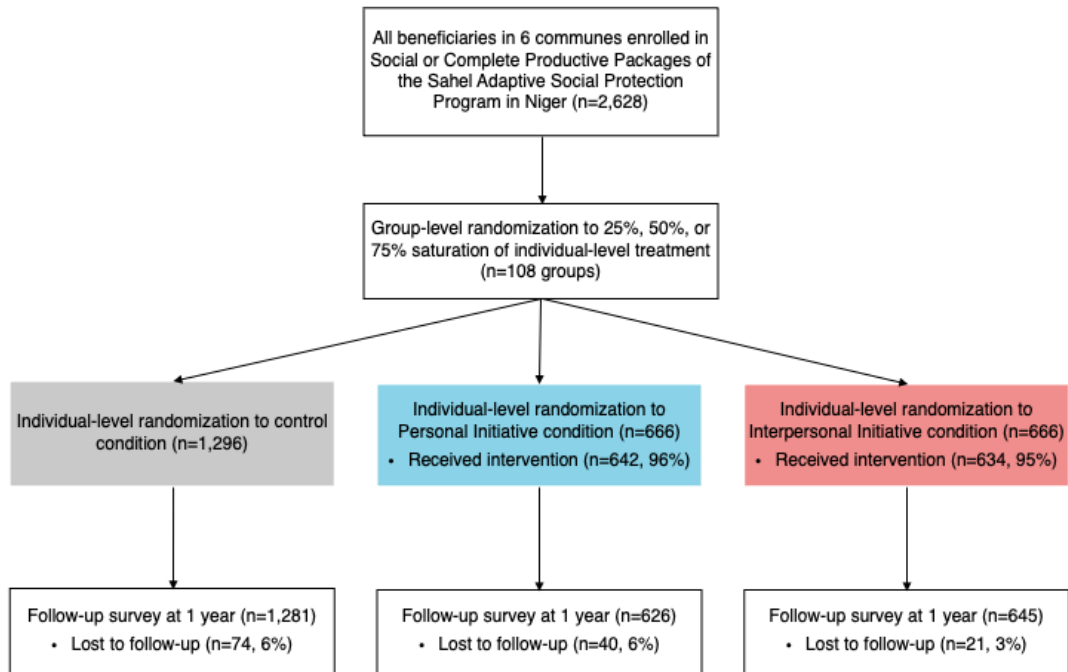
Collective Action	0.09**	0.02	0.07*	0.18***	0.09**	0.04	0.12***	0	0.08**	0.09**	0.18***	0.04	
Social Standing	0.11***	0.08**	0.13***	0.02	-0.03	0.1***	0.08**	0.36***	0.09**	0.52***	0.24***		0.04
Self-Efficacy	0.1**	0.05	0.09**	0.21***	0.08**	0.12***	0.1**	0.23***	0.17***	0.26***		0.24***	0.18***
Future Expectations	0.06*	0.07*	0.03	0.01	0	0.01	0.1***	0.3***	0.05		0.26***	0.52***	0.09**
Controls Earnings	0.17***	0.17***	0.12***	0.11***	0.1***	0.19***	0.03	0.05		0.05	0.17***	0.09**	0.08**
Mental Health	0.05	0	0.07*	0.09**	0.06*	0.11***	-0.03		0.05	0.3***	0.23***	0.36***	0
Social Support	0.09**	0.09**	0.08**	0.22***	-0.04	0.06*		-0.03	0.03	0.1***	0.1**	0.08**	0.12***
Social Norms	0.13***	0.11***	0.17***	0.03	-0.04		0.06*	0.11***	0.19***	0.01	0.12***	0.1***	0.04
Intra-Household Dynamics	0.02	-0.05	-0.07*	0.07*		-0.04	-0.04	0.06*	0.1***	0	0.08**	-0.03	0.09**
Financial Support	0.04	-0.02	0.04		0.07*	0.03	0.22***	0.09**	0.11***	0.01	0.21***	0.02	0.18***
No. HH Bus.	0.44***	0.28***		0.04	-0.07*	0.17***	0.08**	0.07*	0.12***	0.03	0.09**	0.13***	0.07*
Bus. Investments	0.31***		0.28***	-0.02	-0.05	0.11***	0.09**	0	0.17***	0.07*	0.05	0.08**	0.02
Work Days/Mo (Bus.)		0.31***	0.44***	0.04	0.02	0.13***	0.09**	0.05	0.17***	0.06*	0.1**	0.11***	0.09**
	Work Days/Mo (Bus.)	Bus. Investments	No. HH Bus.	Financial Support	Intra-Household Dynamics	Social Norms	Social Support	Mental Health	Controls Earnings	Future Expectations	Self-Efficacy	Social Standing	Collective Action

For these correlations, N=1152 for all indices.

**Table S3.** Correlation matrix among psychosocial variables in Table 1 among control group at follow-up in Policy Experiment

Collective Action		0.04	0.18***	0.09**	0.08**	0	0.12***	0.04	0.09**	0.18***	0.16***	0.08**	0.09**
Social Standing	0.04		0.24***	0.52***	0.09**	0.36***	0.08**	0.1***	-0.03	0.02	0.04	0	0.09**
Self-Efficacy	0.18***	0.24***		0.26***	0.17***	0.23***	0.1**	0.12***	0.08**	0.21***	0.25***	0.04	0.23***
Future Expectations	0.09**	0.52***	0.26***		0.05	0.3***	0.1***	0.01	0	0.01	0	0.07*	0.08*
Controls Earnings	0.08**	0.09**	0.17***	0.05		0.05	0.03	0.19***	0.1***	0.11***	0.02	-0.13***	0.55***
Mental Health	0	0.36***	0.23***	0.3***	0.05		-0.03	0.11***	0.06*	0.09**	0.13***	-0.07*	0.06
Social Support	0.12***	0.08**	0.1**	0.1***	0.03	-0.03		0.06*	-0.04	0.22***	0.08**	0.18***	0.02
Social Norms	0.04	0.1***	0.12***	0.01	0.19***	0.11***	0.06*		-0.04	0.03	0.01	-0.04	0.26***
Intra-Household Dynamics	0.09**	-0.03	0.08**	0	0.1***	0.06*	-0.04	-0.04		0.07*	0.22***	-0.14***	0.08**
Financial Support	0.18***	0.02	0.21***	0.01	0.11***	0.09**	0.22***	0.03	0.07*		0.32***	0.04	0.05
Social Cohesion	0.16***	0.04	0.25***	0	0.02	0.13***	0.08**	0.01	0.22***	0.32***		-0.08**	0.04
IPV Perceptions	0.08**	0	0.04	0.07*	-0.13***	-0.07*	0.18***	-0.04	-0.14***	0.04	-0.08**		-0.05
Control in HH Decisions	0.09**	0.09**	0.23***	0.08*	0.55***	0.06	0.02	0.26***	0.08**	0.05	0.04	-0.05	
	Collective Action	Social Standing	Self-Efficacy	Future Expectations	Controls Earnings	Mental Health	Social Support	Social Norms	Intra-Household Dynamics	Financial Support	Social Cohesion	IPV Perceptions	Control in HH Decisions

For these correlations, N=1152 for all indices.



**Fig. S2. Flowchart of the Design of the Mechanism Experiment**

Within the policy experiment, the Full and Psychosocial arms included psychosocial interventions (specifically community sensitization and life skills training), regular cash transfers, savings groups formation, group coaching, and micro-entrepreneurship training. The Full arm added a lump-sum cash grant. Randomization strata included policy experiment treatment arm, timing of the program components by season, and participation in the policy experiment baseline survey.

**Table S4.** Balance Check of Key Variables Across Conditions in Mechanism Experiment

	Control (N=1296)	Personal Initiative (N=666)	Interpersonal Initiative (N=666)	Total (N=2628)	p value
Proxy Means Testing Score					0.487
Mean (SD)	12.26 (0.31)	12.25 (0.33)	12.25 (0.31)	12.26 (0.31)	
Age					0.964
Mean (SD)	34.33 (14.10)	34.39 (13.78)	34.51 (14.01)	34.39 (13.99)	
Is head of household					0.660
Mean (SD)	0.12 (0.32)	0.13 (0.34)	0.12 (0.33)	0.12 (0.33)	
Is nomad					0.733
Mean (SD)	0.10 (0.30)	0.11 (0.32)	0.11 (0.31)	0.11 (0.31)	
Lives in a hamlet					0.976
Mean (SD)	0.22 (0.42)	0.22 (0.42)	0.22 (0.41)		
Policy experiment treatment arm					0.955
Full N (%)	782 (60.3%)	398 (59.8%)	398 (59.8%)	1578 (60.0%)	
Psychosocial N (%)	514 (39.7%)	268 (40.2%)	268 (40.2%)	1050 (40.0%)	
Timing of programs in policy experiment					0.549
Early N (%)	729 (56.2%)	361 (54.2%)	360 (54.1%)	1450 (55.2%)	
Late N (%)	567 (43.8%)	305 (45.8%)	306 (45.9%)	1178 (44.8%)	

The p values reflect an ANOVA or chi-squared test (depending on the variable type) comparing each variable across treatment and control conditions.<sup>19</sup>

<sup>19</sup> Note that there is an imbalance in the share of participants sampled for the main policy experiment, which is higher for the two treatment conditions ( $M_{\text{Control}}=13\%$ ,  $M_{\text{PI}}=23\%$ ,  $M_{\text{II}}=22\%$ ,  $p<.001$ ). This was due to a coding error. Notably, all participants had been randomly sampled from villages and thus should not differ in meaningful ways from the non-sampled individuals. All analyses control for a binary variable indicating inclusion in the policy experiment.



**Table S5.** Association of Attrition with Baseline Sociodemographics

Outcome	df	Beta	SE	P value
Personal Initiative Condition	2623	0.16	0.76	0.446
Interpersonal Initiative Condition	2623	-0.52	0.25	0.038*
PMT	2623	0.55	0.35	0.121
Age	2623	0.01	0.01	0.025*
Is head of household	2623	0.50	0.23	0.030*
Is nomad	2623	0.05	0.29	0.865
Lives in a hamlet	2623	-0.27	0.23	0.243

Results are from a logistic regression predicting attrition. Regressions control for randomization strata and standard errors are robust. †p<.10, \*p<.05, \*\*p<.01, \*\*\*p<.001.

**Table S6.** Impacts of Personal Initiative and Interpersonal Initiative Interventions on Economic Outcomes at Endline in Mechanism Experiment

		Control	Personal Initiative	Interpersonal Initiative
Outcome	df	Mean (SD)	Coefficient (SE) Robust <i>p</i> -value Cluster robust <i>p</i> -value	Coefficient (SE) Robust <i>p</i> -value Cluster robust <i>p</i> -value
Economic Composite Index	2473	0.00 (1.00)	0.07 (0.05) 0.168 0.263	0.12 (0.05) 0.012 0.021
Food Security Index	2473	0.00 (1.00)	0.07 (0.05) 0.152 0.262	0.11 (0.05) 0.029* 0.059†
Food security	2473	6.83 (1.52)	0.15 (0.07) 0.034* 0.074†	0.16 (0.07) 0.032* 0.054†
Dietary diversity	2473	9.12 (8.75)	0.07 (0.42) 0.87 0.898	0.59 (0.43) 0.169 0.214
Business Omnibus Index	2474	0.00 (1.00)	0.04 (0.05) 0.388 0.469	0.09 (0.05) 0.069† 0.107

<b>Business Engagement Index</b>	<b>2474</b>	<b>0.00 (1.00)</b>	<b>0.05 (0.05) 0.294 0.346</b>	<b>0.09 (0.05) 0.053† 0.093†</b>
Has a business	2474	0.82 (0.38)	-0.01 (0.02) 0.778 0.779	0.03 (0.02) 0.079† 0.118
No. businesses	2474	1.24 (1.21)	0.01 (0.06) 0.848 0.856	0.05 (0.06) 0.370 0.410
No. businesses past year	2474	0.48 (1.04)	0.04 (0.05) 0.395 0.393	0.05 (0.05) 0.295 0.331
Business investments (yearly, USD)	2474	106.12 (181.94)	19.78 (9.17) 0.031* 0.059†	14.22 (8.85) 0.108 0.163
Business assets value (yearly, USD)	2474	15.02 (22.19)	0.62 (1.13) 0.585 0.629	0.90 (1.09) 0.409 0.474
No. days worked	2474	17.47 (20.15)	0.78 (0.94) 0.407 0.497	0.82 (0.90) 0.366 0.402
Growth intentions	2474	1.06 (0.83)	0.01 (0.04) 0.750 0.761	0.07 (0.04) 0.087† 0.119
Healthy business practices index	2457	0.00 (1.00)	0.05 (0.05) 0.274 0.311	0.06 (0.04) 0.184 0.254
<b>Business Performance Index</b>	<b>2474</b>	<b>0.00 (1.00)</b>	<b>0.00 (0.05) 0.943 0.955</b>	<b>0.05 (0.05) 0.354 0.377</b>
Business profits (monthly, USD)	2474	35.61 (50.24)	-0.49 (2.44) 0.841 0.876	2.91 (2.53) 0.249 0.297
Business revenues (monthly, USD)	2474	118.45 (162.20)	2.68 (7.88) 0.734 0.783	5.01 (7.86) 0.524 0.518

Note: Columns 4 and 5 show regression output comparing the Personal Initiative and Interpersonal Initiative conditions, respectively, to the control condition in the Mechanism experiment. Regressions control for randomization strata and standard errors are robust. Data on beneficiary businesses was collected on a subset of common off-farm businesses types. †p<.10, \*p<.05, \*\*p<.01, \*\*\*p<.001.

**Table S7.** Robustness analyses: Impacts of Personal Initiative and Interpersonal Initiative interventions on economic and psychosocial outcome indices, controlling for age and head of household status, at endline in Mechanism Experiment

		Control	Personal Initiative	Interpersonal Initiative
Outcome	df	Mean (SD)	Coefficient (SE) Robust <i>p</i> -value Cluster robust <i>p</i> -value	Coefficient (SE) Robust <i>p</i> -value Cluster robust <i>p</i> -value
Economic Composite Index	2472	0.00 (1.00)	0.07 (0.05) 0.167 0.262	0.12 (0.05) 0.012 0.021
Food Security Index	2471	0.00 (1.00)	0.07 (0.05) 0.150 0.260	0.11 (0.05) 0.029* 0.059†
Business Omnibus Index	2472	0.00 (1.00)	0.04 (0.05) 0.391 0.470	0.09 (0.05) 0.070† 0.107
Psychosocial composite index	2485	0.00 (1.00)	0.10 (0.05) 0.039* 0.058†	0.12 (0.05) 0.014 0.029
Intrapersonal composite index	2485	0.00 (1.00)	0.14 (0.05) 0.003** 0.010*	0.12 (0.04) 0.009** 0.023*
Relational composite index	2485	0.00 (1.00)	0.05 (0.05) 0.333 0.337	0.09 (0.05) 0.072† 0.118

Note: Columns 4 and 5 show regression output comparing the Personal Initiative and Interpersonal Initiative conditions, respectively, to the control condition in the Mechanism experiment. Regressions control for randomization strata, age, and head of household status. Standard errors are robust. †*p*<.10, \**p*<.05, \*\**p*<.01, \*\*\**p*<.001.

**Table S8.** Impacts of Personal Initiative and Interpersonal Initiative interventions on Household-Owned and -Managed Businesses Among a Subsample of Participants in the Policy and Mechanism Experiments

		Control	Personal Initiative	Interpersonal Initiative
Outcome	df	Mean (SD)	Coefficient (SE) Robust <i>p</i> -value Cluster robust <i>p</i> -value	Coefficient (SE) Robust <i>p</i> -value Cluster robust <i>p</i> -value
<b>Business Omnibus Index (HH)</b>	<b>452</b>	<b>0.00 (1.00)</b>	<b>0.19 (0.13) 0.142 0.128</b>	<b>0.30 (0.13) 0.023* 0.009**</b>
<b>Business Engagement Index (HH)</b>	<b>452</b>	<b>0.00 (1.00)</b>	<b>0.19 (0.13) 0.151 0.154</b>	<b>0.28 (0.14) 0.039 0.021</b>
HH has a business	452	0.51 (0.50)	-0.02 (0.06) 0.769 0.757	0.06 (0.06) 0.286 0.236
No. HH businesses	452	0.64 (0.75)	0.07 (0.1) 0.435 0.403	0.18 (0.1) 0.069† 0.053†
No. HH businesses past year	452	0.14 (0.42)	0.05 (0.05) 0.312 0.334	0.02 (0.05) 0.661 0.668
HH Business investments (yearly, USD)	452	0.50 (6.40)	1.71 (1.11) 0.125 0.131	1.65 (1.16) 0.156 0.157
HH Business asset value (USD)	452	50.90 (180.96)	-10.64 (18.34) 0.562 0.574	15.95 (24.56) 0.516 0.539
No. days worked (HH)	452	5.62 (10.88)	1.1 (1.32) 0.406 0.434	1.74 (1.3) 0.182 0.193
Growth intentions (HH)	452	0.01 (0.08)	0.03 (0.02) 0.084† 0.086†	0.03 (0.02) 0.083† 0.074†
<b>Business Performance Index (HH)</b>	<b>452</b>	<b>0.00 (1.00)</b>	<b>0.11 (0.13) 0.400 0.381</b>	<b>0.21 (0.13) 0.099† 0.056†</b>
HH Business profits (monthly, USD)	452	31.71 (80.83)	10.68 (10.77) 0.322 0.301	14.81 (10.18) 0.146 0.103
HH Business revenues (monthly, USD)	452	69.71 (184.59)	13.66 (21.56) 0.527 0.512	41.25 (24.53) 0.093† 0.053†

Note: Columns 4 and 5 show regression output comparing the Personal Initiative and Interpersonal Initiative conditions, respectively, to the control condition in the Mechanism experiment. Regressions control for randomization strata and standard errors are robust. This data is from the subsample randomly selected to participate

in the policy experiment, in which more data was collected from beneficiaries' households. Data was only collected on a subset of common off-farm businesses types. "HH" stands for household. <sup>†</sup>p<.10, \*p<.05, \*\*p<.01, \*\*\*p<.001.

**Table S9.** Results of mediation analysis of the effects of Personal Initiative and Interpersonal Initiative interventions on the economic composite index through psychosocial variables at endline in the Mechanism Experiment

Mediator Variable	'a' path (SE)	'b' path (SE)	Indirect Effect (95% CI)
Personal Initiative condition vs Control condition (N=1,840)			
Psychosocial composite index	0.10* (0.05)	0.40*** (0.02)	0.04* (95% CI 0.00 to 0.07)
Intrapersonal composite index	0.13** (0.05)	0.40*** (0.02)	0.05** (95% CI 0.01 to 0.09)
Relational composite index	0.05 (0.05)	0.32*** (0.02)	0.01 (95% CI -0.01 to 0.04)
Future expectations	0.12* (0.05)	0.32*** (0.02)	0.04* (95% CI 0.01 to 0.07)
Well-being	0.09* (0.05)	0.24*** (0.02)	0.02 <sup>†</sup> (95% CI 0.00 to 0.04)
Household Dynamics	0.03 (0.05)	0.19*** (0.02)	0.00 (95% CI -0.01 to 0.02)
Interpersonal Initiative condition vs Control condition (N=1,854)			
Psychosocial composite index	0.12 (0.05)	0.38*** (0.02)	0.05** (95% CI 0.01 to 0.08)
Intrapersonal composite index	0.12 (0.04)	0.38*** (0.02)	0.04* (95% CI 0.01 to 0.07)
Relational composite index	0.09 <sup>†</sup> (0.05)	0.29*** (0.02)	0.03* (95% CI 0.00 to 0.06)
Future expectations	0.15** (0.05)	0.30*** (0.02)	0.04*** (95% CI 0.01 to 0.07)
Well-being	0.08 <sup>†</sup> (0.05)	0.20*** (0.02)	0.02 <sup>†</sup> (95% CI 0.00 to 0.03)
Household Dynamics	0.10 (0.04)	0.17*** (0.02)	0.02* (95% CI 0.00 to 0.04)

Note: Only those psychosocial variables that showed significant 'a' paths, i.e., positive treatment effects by one or both interventions are included in this table ('a' path reflects results from Table 2). The 'mediation' package in R was used with 1000 bootstrapped simulations to generate the indirect effect and its 95%CI. The 'b' paths were estimated with robust SEs. All mediator variables are standardized. All analyses control for policy experiment treatment arm, timing of the policy experiment activities by season, and participation in the policy experiment baseline survey. N=122 observations were dropped due to missing data on one or more of the mediator variables in the Personal Initiative vs Control condition analysis and N=108 observations in the Interpersonal Initiative vs Control condition analysis. <sup>†</sup>p<.10, \*p<.05, \*\*p<.01, \*\*\*p<.001.

**Table S10.** Impacts of Varying Within-Village Saturation of Treatment (Personal or Interpersonal Initiative interventions) on intrapersonal and relational outcomes at endline in the Mechanism Experiment

		Reference group: 25% Saturation of Program Beneficiaries Treated	50% Saturation of Program Beneficiaries Treated vs 25%	75% Saturation of Program Beneficiaries Treated vs 25%
Outcome	df	Mean (SD)	Coefficient (SE) Cluster robust <i>p</i> -value	Coefficient (SE) Cluster robust <i>p</i> -value
Psychosocial Composite Index	2487	-0.02 (1.02)	0.08 (0.09) 0.382	0.15 (0.09) 0.087
Intrapersonal Composite Index	2487	-0.03 (1.07)	0.13 (0.09) 0.145	0.14 (0.08) 0.075
Well-being	2487	-0.03 (1.04)	0.07 (0.08) 0.390	0.14 (0.08) 0.086
Self-Efficacy	2473	-0.02 (1.00)	0.05 (0.09) 0.570	0.04 (0.08) 0.636
Future Expectations	2473	-0.03 (1.04)	0.15 (0.08) 0.079	0.13 (0.08) 0.079
Relational Composite Index	2487	0.00 (0.99)	0.03 (0.09) 0.749	0.11 (0.08) 0.176
Partner Dynamics	2226	0.06 (1.01)	-0.03 (0.06) 0.674	0.01 (0.07) 0.906
Household Dynamics	2487	-0.01 (0.99)	0.04 (0.08) 0.648	0.14 (0.08) 0.087
Decision-Making	2473	-0.02 (1.03)	-0.03 (0.08) 0.693	0.05 (0.07) 0.430
Social Standing	2473	-0.02 (1.04)	0.06 (0.09) 0.522	0.10 (0.09) 0.270

Social Support	2487	0.00 (0.98)	0.07 (0.07) 0.323	0.08 (0.07) 0.202
Social Cohesion	2473	-0.01 (0.98)	-0.01 (0.08) 0.870	-0.02 (0.08) 0.840

Note: Columns 4 and 5 reflects regression output comparing the outcomes of the villages in which respectively 50% or 75% compared to 25% of the village was treated with either the Personal Initiative and Interpersonal Initiative intervention. Outcomes are standardized to the control condition, at the individual level. Regressions control for randomization strata, and standard errors are clustered at the village level. †p<.10, \*p<.05, \*\*p<.01, \*\*\*p<.001.

**Table S11.** Impacts of Varying Within-Village Saturation of Treatment (Personal or Interpersonal Initiative interventions) on economic outcomes at endline in the Mechanism Experiment

		Reference group: 25% Saturation of Program Beneficiaries Treated	50% Saturation of Program Beneficiaries Treated vs 25%	75% Saturation of Program Beneficiaries Treated vs 25%
Outcome	df	Mean (SD)	Coefficient (SE) Cluster robust <i>p</i> -value	Coefficient (SE) Cluster robust <i>p</i> -value
Economic Composite Index	2474	-0.03 (0.95)	0.10 (0.12) 0.387	0.10 (0.12) 0.406
Food Security Index	2473	-0.03 (0.97)	0.12 (0.11) 0.274	0.09 (0.11) 0.427
Food security	2473	6.86 (1.52)	0.11 (0.14) 0.446	0.06 (0.13) 0.630
Dietary diversity	2473	8.48 (8.13)	0.13 (0.94) 0.232	0.90 (1.00) 0.370
Business Omnibus Index	2474	-0.02 (0.96)	0.04 (0.10) 0.657	0.07 (0.10) 0.479
Business Engagement Index	2474	-0.02 (0.95)	0.05 (0.09) 0.606	0.08 (0.10) 0.423

Has a business	2474	0.83 (0.38)	0.01 (0.03) 0.798	0.00 (0.03) 0.866
No. businesses	2474	1.19 (0.96)	0.05 (0.09) 0.578	0.12 (0.10) 0.248
No. businesses past year	2474	0.44 (0.79)	0.06 (0.05) 0.225	0.13 (0.06) 0.039
Business investments (yearly, USD)	2474	100.53 (178.05)	21.65 (20.15) 0.283	18.51 (19.66) 0.347
Business assets value (yearly, USD)	2474	15.90 (23.15)	-0.88 (1.75) 0.618	-0.59 (1.69) 0.727
No. days worked	2474	16.05 (18.36)	1.24 (1.89) 0.511	2.21 (1.76) 0.209
Growth intentions	2474	1.05 (0.81)	0.01 (0.07) 0.886	0.03 (0.07) 0.653
Healthy business practices index	2457	0.02 (1.01)	-0.01 (0.08) 0.920	-0.01 (0.07) 0.887
<b>Business Performance Index</b>	<b>2474</b>	<b>-0.01 (0.95)</b>	<b>0.02 (0.10) 0.856</b>	<b>0.04 (0.10) 0.721</b>
Business profits (monthly, USD)	2474	34.77 (47.69)	<b>1.36 (4.80) 0.777</b>	<b>2.04 (4.88) 0.676</b>
Business revenues (monthly, USD)	2474	117.32 (156.89)	1.31 (16.16) 0.935	4.50 (15.67) 0.774

Note: Columns 4 and 5 reflects regression output comparing the outcomes of the villages in which respectively 50% or 75% compared to 25% of the village was treated with either the Personal Initiative and Interpersonal Initiative intervention. Outcomes are standardized to the control condition, at the individual level. Regressions control for randomization strata, and standard errors are clustered at the village level. †p<.10, \*p<.05, \*\*p<.01, \*\*\*p<.001.



**Table S12.** Effects of Interpersonal Initiative Intervention vs Personal Initiative Intervention Immediately Post-Intervention

Outcome	df	Personal Initiative	Interpersonal Initiative
		Mean (SD)	Coefficient (SE)
			Robust <i>p</i> -value
<b>Economic Composite Index</b>	<b>1271</b>	<b>0.96 (0.15)</b>	<b>0.00 (0.01) 0.657</b>
Approach behaviors	1271	2.72 (0.94)	0.06 (0.05) 0.277
Approach feelings	1271	3.7 (0.33)	-0.01 (0.02) 0.656
Budget Allocation	1271	7.17 (2.04)	-0.04 (0.12) 0.704
<b>Social Composite Index</b>	<b>1327</b>	<b>0.95 (0.15)</b>	<b>0.01 (0.01) 0.176</b>
Social Standing	1271	7.07 (1.59)	0.00 (0.09) 0.985
Social Norms	1271	6.49 (1.37)	-0.02 (0.08) 0.797
Social Support	1271	0.94 (0.24)	0.01 (0.01) 0.252
Anticipation of Negative Reputation	1327	0.15 (0.36)	-0.03 (0.02) 0.088†
Trust	1271	6.54 (2.49)	0.03 (0.14) 0.813
Self-efficacy	1327	8.97 (2.53)	-0.09 (0.14) 0.541
Future expectations (SES)	1271	8.64 (1.34)	0.03 (0.08) 0.677
Future Expectations (Program)	1271	7.29 (1.63)	-0.07 (0.09) 0.430
Prosocial preferences	1271	0.93 (0.27)	-0.02 (0.02) 0.306
Amina evaluation	1271	9.56 (0.79)	-0.05 (0.05) 0.335

Note: This data was collected exclusively among the treatment groups immediately post-intervention delivery. No data was collected among the control group. Columns 3 and 4 show regression output comparing the Personal Initiative and Interpersonal Initiative conditions to each other in the Mechanism experiment. Composite indices are computed by taking the average of the standardized subcomponents. Regressions control for randomization strata and standard errors are robust. † $p < .10$ , \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ .