

# Behavioral Change Promotion, Cash Transfers and Early Childhood Development

## Experimental Evidence from a Government Program in a Low-Income Setting

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*June 6, 2022<sup>1</sup>*

### Abstract

Signs of development delays and malnutrition are widespread among young children in low-income settings. Social protection programs such as cash transfers are increasingly combined with behavioral change promotion or parenting interventions to improve early childhood development. This paper disentangles the effects of behavioral change promotion from cash transfers to poor households through an experiment embedded in a government program in Niger. The study is also designed to identify within-community spillovers from the behavioral change intervention. The findings show that behavioral change promotion affects a range of practices related to nutrition, health, stimulation, and child protection. Moderate gains in children's socio-emotional development are observed, but there is no improvement in anthropometrics or cognitive development. Cash transfers alone do not alter parenting practices or improve early childhood development. Cash transfers raise food security and consumption at the household level, including the purchase of non-food items privately consumed by adults. The behavioral intervention offsets these changes and instead improves children's food security, pointing to some intra-household reallocations toward children. Local spillovers on parenting practices are found, which further highlights that cash alone is not the main driver of changes in parenting behaviors.

**Keywords:** Early Childhood Development, Parenting, Social and Behavioral Change Communication, Cash Transfers, Spillovers, Sahel, Africa, Field Experiment.

**JEL Codes:** I15, I38, J13, O15.

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<sup>1</sup> This paper is based on a collaboration between the government of Niger, the World Bank and UNICEF to embed a behavioral change intervention to promote Early Childhood Development as part of the Niger national safety net program. The study was supported by the Strategic Impact Evaluation Fund (SIEF), the Early Learning Partnership and the Sahel Adaptive Social Protection Program at the World Bank, as well as the Niger Adaptive Safety Nets Project, managed by the Cellule Filets Sociaux (CFS) in the Prime Minister's office of the Government of Niger. We are grateful to Ali Mory Maidoka, Bassirou Karimou, Kadi Aboubacar and Aichatou Bello at CFS, Omar Habib, Rocio Berzal, and Mariama Hassane Amadou at UNICEF, as well as Carlo del Ninno, Fanta Touré and Mahamane Maliki Amadou at the World Bank for a fruitful collaboration. Marc Smitz coordinated the baseline and follow-up surveys and provided excellent contributions to RCT implementation and data analysis. Horacio Vera Cossio provided excellent research assistance during data analysis. The Nigerien National Statistical Office (INS) collected baseline data. Riseal and the Swiss Tropical and Public Health Institute (STPH) collected follow-up data, with coordination from Kaspar Wyss, Alexandra Nicola, Ibrahim Sy and Amina Garba. Charles Super oversaw the use of the child cognitive test for the follow-up survey. Follow-up survey data was collected with SurveySolutions, with the support of Misha Lokshin, Zurab Sajaia, Sondo Eloi Somtinda, Martial Kouamé and Arthur Shaw. We are grateful for inputs and comments at various parts of the study from Jenny Aker, Harold Alderman, David Evans, Emanuela Galasso, Phillippe Leite, Karen Macours, Meena Cabral de Mello, Quentin Stoeffler, Charles Super, Julieta Trias, Marian Zeitlin, anonymous SIEF and DIME referees, as well as seminar participants at STPH, ETH Zürich, the University of Zürich, UNICEF Innocenti and the World Bank. The computational reproducibility of the results has been verified by DIME analytics. Both authors worked for the World Bank Social Protection & Jobs Global Practice (Premand as a staff, Barry as a consultant) at the time the study was implemented and also supported program implementation. Premand made additional contributions as a guest researcher at ETH Zürich and at DIME. The findings, interpretations, and conclusions expressed in this paper are entirely those of the authors. They do not necessarily represent the views of the World Bank and its affiliated organizations; or those of the Executive Directors of the World Bank, the government they represent; or those of UNICEF or the government of Niger. Corresponding author: Patrick Premand, ppremand@worldbank.org.

## **1. Introduction**

A large number of children in developing countries suffer from malnutrition or signs of development delays. Multiple risk factors contribute to poor early childhood development outcomes (Lancet, 2007, Lancet, 2011). Socio-economic gradients in child development have been consistently documented (Paxson and Schady, 2007; Naudeau et al., 2010; Fernald et al., 2011; Schady et al., 2015). Poorer households in low-income countries are typically exposed to a broader range of risk factors. The expansion of social protection systems around the world creates new opportunities to reach the poorest families and children at risk of malnutrition and development delays. Potential complementarities have been highlighted between social protection interventions and approaches to promote early childhood nutrition and development (Engle et al., 2011; Alderman, 2011). Policy interest is particularly high given the large potential returns to investments in early childhood (Currie and Thomas 1999; Heckman and Masterov, 2007) and increased attention to the long-term consequences of under-investments in children's human capital (Gatti et al., 2018).

Safety net programs such as cash transfers have rapidly expanded in developing countries over the last decades. They aim to reduce current poverty and decrease the inter-generational transmission of poverty. The welfare impacts of cash transfers have been widely documented (Fiszbein and Schady, 2009), including in Africa (Ralston et al., 2017). In low-income settings, cash transfers are often unconditional, but programs increasingly include accompanying measures to encourage investments in children's human capital. This is particularly common in Africa, where over a dozen countries have tested a model combining cash transfers with accompanying measures to promote early childhood development (Beegle et al., 2018). These programs attempt not only to address malnutrition, but also to foster early childhood development more broadly. This implies greater attention to children's cognitive and socio-emotional development. The accompanying measures are based on parenting training curricula or on social and behavioral change communication approaches. In some programs, participation is a formal condition to receive the transfers, while in other programs it constitutes a soft condition without loss of benefits for households that may not participate.

In 2011, the Government of Niger started to set up a national safety net system. It includes a cash transfer program that has expanded over time and reached 100,000 households by 2019. The cash transfer program provides small, monthly transfers of 10,000 FCFA (about USD 20)<sup>2</sup> to women in poor households

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<sup>2</sup> The exchange rate was 1 USD = 497 CFA francs (FCFA) on January 1, 2013, and 1 USD = 541 CFA francs (FCFA) on January 1, 2015.

for a period of 24 months. One of its innovations is to combine cash transfers with behavioral change accompanying measures to promote early childhood development. Specifically, the behavioral change component includes parenting training activities to encourage health, nutrition, psycho-social stimulation, and child protection practices. It is implemented through monthly village assemblies, community meetings and household visits delivered by trained NGO operators and community workers. Participation is encouraged and monitored but is not a formal condition to receive the cash transfers. We collaborated with the Niger safety net unit in the Office of the Prime Minister to embed an experiment in the roll-out of the program.

In this paper, we present results from an RCT that disentangles the effects of behavioral change promotion from cash transfers to very poor households. The objective is to document whether the interventions led to changes in parenting practices and resulted in improvements in early childhood development. Villages eligible for the cash transfer program were randomly assigned to (i) a control group, (ii) cash transfers only, or (iii) cash transfers with behavioral change promotion (BCC). Within treated villages, we survey cash transfer beneficiary and non-beneficiary households to also identify local spillovers from the behavioral change intervention.

The study makes three main contributions. First, we estimate the value added of the BCC intervention on parenting practices and young children's human capital among cash transfer beneficiary households. Second, we tease out the relative effects of the behavioral change and cash transfer interventions. Third, we measure local spillovers from the BCC intervention on non-beneficiary households in treated villages.

The results show that the behavioral change intervention affects a range of practices related to nutrition, health, stimulation and child protection. Moderate gains in children's socio-emotional development are observed, but there is no improvement in anthropometrics or cognitive development. Cash transfers alone do not alter parenting practices and do not improve early childhood development outcomes. We also find that cash transfers and the behavioral intervention have differential intra-household effects. The behavioral intervention improves dietary diversity among children, but no such improvement is found for the household as a whole. The opposite is found for cash transfers, which induce improvements in dietary diversity at the household level but not for children. The cash transfers increase household consumption of non-food items, in particular non-food items privately consumed by adults, which the BCC intervention offsets. Local spillovers on parenting practices are found among households not receiving cash transfers within treated communities, which is consistent with changes in parenting practices not being driven by cash alone.

The paper complements the literature on early childhood interventions in developing countries (Currie, 2001; Schady, 2006). Various studies have analyzed nutrition-specific interventions (Walker et al. 2007, Lancet, 2008; Maluccio et al., 2009; Galasso and Wagstaff, 2019), but meta-reviews suggest mixed results (IEG, 2015). A range of papers have also assessed behavioral change or information interventions in the health sector (Alderman, 2007; Fitzsimons et al., 2016; Linnemayr and Alderman, 2011), including social and behavioral change (SBCC) to promote breastfeeding or complementary feeding practices (for reviews, see Bhutta et al. 2008; Dewey and Adu-Afarwuah, 2008; Imdad et al. 2011; Shi and Zhang 2011).<sup>3</sup> Yet research has suggested that interventions focusing on nutrition or health alone might not be most effective and that a more holistic approach to early childhood development might be beneficial. For example, supporting psycho-social stimulation in addition to nutrition might be more effective than focusing on nutrition alone (Grantham-McGregor et al., 1991; Gertler et al., 2014). Some multi-faceted interventions targeting pregnant women have also proved effective (Carneiro et al., 2021). Several policies to foster psycho-social stimulation have been shown to improve children’s cognitive and socio-emotional development in developing countries. These include community-based centers or preschools, although quality issues can limit effectiveness.<sup>4</sup> There is also growing interest in parenting training interventions that can be delivered through a mix of community meetings and home visits. By promoting behavioral change without requiring large-scale infrastructure investments, these approaches are flexible and amenable to scale-up in low-income contexts. Parenting interventions have been shown to improve parenting practices (Jeong et al., 2018) and short-term results on child development have been encouraging (Attanasio et al., 2018; Attanasio et al, 2020; J-PAL, 2020; Macours et al., 2015), though there are still questions if these impacts can be sustained over time (Andrew et al., 2018). Existing evidence is mostly based on relatively small-scale proof-of-concept pilots. One recent exception is the evaluation of a large-scale parenting program in Chile, a high-income country (Carneiro et al., 2019). Knowledge on the effectiveness of parenting interventions in low-income settings remains thin, especially for low-cost approaches implemented at relatively large scale such as the one we study in this paper.

The study also adds to the literature on cash transfers and human capital. The evidence has generally found cash transfers to raise consumption and increase access to health and education services (Fiszbein

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<sup>3</sup> Other examples in the health sector include HIV behavior change programs, which have led to changes in practices, with less success in reducing risky sexual behaviors (for a meta-review, see Krishnaratne et al., 2016).

<sup>4</sup> Several studies document positive impacts on early childhood development outcomes, see for instance: Attanasio and Vera-Hernández 2004; Behrman et al. 2004; Berlinski et al. 2008; 2009; Martinez et al., 2017; Bernal and Ramirez, 2019. Quality of services can be an issue, however, and several recent studies have found more limited results (Özler et al., 2016; Blimpo et al., 2020; Bouguen et al., 2018; Berkes et al., 2019; Bernal et al., 2019).

and Schady, 2009; Garcia and Moore, 2011). Results on anthropometrics and child development have been more limited (de Groot et al., 2017). There are open questions on pathways and design features for cash transfers to affect early childhood development, including on potential synergies between parenting education interventions and cash transfers. The transfer amounts (Fernald et al., 2008) as well as the duration or timing of exposure to cash transfers can matter (Sánchez et al., 2020). Macours et al. (2012) show that a CCT program has sustained impacts on children’s cognitive development in Nicaragua. They attribute the results to changes in parenting practices driven from a social marketing campaign that accompanied the CCT.<sup>5</sup> Conditionalities may affect human capital investments (Akresh et al., 2013; Baird et al., 2011; Baird et al., 2014), including in early childhood (Lopez Boo and Creamer, 2019). In many low-income settings, conditionalities are difficult to implement, especially in contexts with weak health or education systems. A growing number of low-income countries have been implementing a model where unconditional cash transfer programs are combined with complementary interventions encouraging investments in children’s human capital that are presented as “soft conditionalities”. In this paper, we tease out the relative effect of cash transfers and the value added of the behavioral change intervention on early childhood development in Niger. As such, we complement a recent literature on cash transfers, information interventions and children’s human capital. For instance, Levere et al. (2016) isolate the value-added of adding cash transfers to an information intervention delivered by health centers. We isolate the value-added of adding a BCC intervention to a cash transfer program delivered through a government-led social protection system. McIntosh and Zeitlin (2018) compare cash transfer to a package of nutrition-support and nutrition information, which they cannot disentangle. Ahmed et al. (2019) study the effect of providing nutrition information as part of a cash transfer program on nutrition outcomes. Our contribution is to isolate the value-added of a parenting intervention layered onto a cash transfer program and consider early childhood development beyond nutrition only.

The setting of our experiment is noteworthy, as it took place in a context of widespread extreme poverty in the understudied Sahel region (Porteous, 2020). Niger has among the lowest levels of human development in the world (UNDP, 2018). As such, the study provides information about the role of behavioral change as a determinant of child development at early stages of economic development. The experiment was embedded in a government-led program, which provides important evidence from a scalable intervention implemented in real-life conditions (Muralidharan and Niehaus, 2017). Niger was among the first countries to develop and implement behavioral measures to promote early childhood

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<sup>5</sup> Duarte-Gómez et al. (2004) have shown that information sessions accompanying the PROGRESA CCT contributed to the program’s impact on a small set of early childhood development outcomes in Mexico.

development through a large-scale cash transfer program in Africa, so that lessons learned are of direct policy interest.

Finally, our paper relates to the literature on the spillovers generated by social programs. Spillovers from cash transfers have been studied through indirect impacts on non-beneficiaries, changes in food prices or local economy effects (Angelucci and de Giorgi, 2009; Bandiera et al. 2017; Cunha et al., 2018; Filmer et al., 2021). Spillovers are particularly relevant for interventions that seek to change practices and social norms, such as information, behavioral change or parenting interventions. However, they have been less studied in the context of early childhood interventions, and this is one of our contributions.

The paper is structured as follows. Section 2 describes the intervention. Section 3 summarizes the experimental design and data. Section 4 outlines the estimation strategy and the main outcomes of interest. Section 5 presents the main results. Section 6 discusses mechanisms and Section 7 local spillovers. Section 8 concludes. Tables and figures are presented in the annex.

## **2. Context and Interventions**

Niger is one of the poorest countries in the world, with 51.4 percent of the rural population living in poverty, along with particularly low levels of human development and children's outcomes (World Bank, 2017; UNDP, 2018). The prevalence of chronic malnutrition as measured by stunting (low height-for-age) is estimated at 43 percent (INS, 2013), with even higher seasonal malnutrition. Severe early childhood development challenges are compounded by one of the fastest population growth in the world, with a fertility rate of 7.6 children per woman (INS, 2013).

Social protection interventions in Niger have traditionally focused on providing short-term emergency assistance through seasonal cash transfers during the lean season or in the aftermath of crisis (Aker et al, 2016; Brück et al., 2018, Hoddinott et al., 2018). Seeking a more permanent system, in 2011 the government initiated a national safety net program managed by the Safety Nets Unit<sup>6</sup> in the Office of the Prime Minister.<sup>7</sup> The main intervention is a cash transfer program that has reached approximately 100,000 beneficiary households between 2012 and 2019. The program provides small, monthly unconditional

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<sup>6</sup> *Cellule Filets Sociaux* (CFS).

<sup>7</sup> It has received support from the World Bank and several bilateral donors, with a funding envelope of over US\$180 million between 2011 and 2025.

transfers of 10,000 FCFA for 24 months to poor households targeted by proxy-means testing.<sup>8</sup> The two-year duration of the program is widely known and clearly communicated to local leaders and beneficiaries.<sup>9</sup> Within targeted households, women are the recipients of cash transfers. As such, beyond improving household consumption and welfare, it is also expected that part of cash transfers will be invested in children's human capital through better nutrition and increased use of health and education services.<sup>10</sup> However, it is unclear if relaxing financial constraints alone is sufficient to trigger such investments in children's human capital.

The cash transfers are accompanied by parenting training on nutrition, psycho-social stimulation, health and sanitation. Besides financial resources, the program thus also provides information to parents. A "behavioral change component" (BCC, or "*Volet Comportemental*") explicitly focuses on encouraging behavioral changes in parenting practices to promote investments in children's human capital. It provides information and seeks to influence social norms to encourage adoption of a range of practices. Participation in the behavioral change accompanying measures is framed as a soft conditionality or co-responsibility for beneficiaries to receive the cash transfers. Beneficiaries make an oral commitment to participate but the conditionality is not enforced, i.e. even if a beneficiary does not participate, she will continue to receive cash transfers. The behavioral accompanying measures constitute a demand-side approach that aims to provide information to parents. The intervention does not seek to directly improve the supply of health services, the provision of direct nutritional support or stimulation activities for children.

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<sup>8</sup> The cash transfer amounts were calibrated based on international practice, which suggests setting transfers equivalent to 10-20 percent of monthly expenditures of targeted households. Based on data available during project design, the transfer amounts of 120,000 FCFA per year represented 15.6 percent of the rural poverty line (110,348 FCFA per person per year, or 772,436 FCFA per household per year, with an average household size of 7) (World Bank, 2011). We find similar levels of average food and non-food consumption per capita per year among future program beneficiaries in our baseline sample (103,920 FCFA per person per year, see Section 4.3). However, we also find larger household sizes (9.6 members on average), so that yearly transfers amount to 12% of total consumption on average. Food consumption represents 80% of total consumption, so that transfers represent 15% of total household food consumption.

<sup>9</sup> Although the two-year program is not fully permanent, it implies a longer duration of exposure than other cash transfers in the Sahel region, in particular those delivered by humanitarian actors that only last for 2-4 months during the lean agricultural season (June-September). It is quite common for regular cash transfer programs in sub-Saharan Africa to last for a limited number of years (Beegle et al., 2018) rather than have open-ended participation as in CCT programs in Latin America. Ralston et al. (2017) review programs in sub-Saharan Africa and find a duration of exposure ranging from 4 months to 3 years. The duration of exposure in the program we study is close to the median in their sample

<sup>10</sup> The program also seeks to facilitate investments in income-generating activities. The effects of a prior cash transfer pilot on productive investments are discussed in greater detail in Stoeffler et al. (2020). Bossuroy et al. (2022) analyze the value-added of multifaceted productive interventions added to cash transfers in a subsequent phase of the program. Beneficiary households in our sample do not receive any of these complementary interventions.

The BCC intervention curriculum contains 14 core modules covering four main domains (see annex for additional details):

- *Nutrition*: Exclusive breastfeeding for the first six months; complementary feeding after six months; recognizing signs of malnutrition.
- *Health*: Preventive health practices to protect children against diseases; utilization of health services at first sign of illness; hygiene and handwashing; family planning.
- *Psycho-Social Stimulation*: Language stimulation; stimulation through play; school readiness; brain development; birth registration, child school enrollment and attendance.
- *Child Protection*: Discipline, punishment and conflict management; attachment and socio-emotional development.

The behavioral change promotion intervention was designed to last approximately 18 months, starting three months after the first cash transfer payment. As part of the accompanying measures, each beneficiary household participates in 3 activities per month:<sup>11</sup> a village assembly delivered by an NGO operator, a small-group meeting delivered by a community educator, and a home visit delivered by the same community educator. The village assembly is organized for approximately 50 beneficiary households on average. Although non-beneficiary households in those villages are not explicitly targeted, they can also participate in the assemblies. The community educator delivers one small-group meeting (“*causerie*”) targeted to groups of 25 beneficiaries each month, and then a household visit targeted to each beneficiary household each month.

The intervention is based on a positive deviance approach, seeking to identify local examples of good practices to trigger broader behavioral change in the community. Its pedagogy relies heavily on role play and theater pieces, as well as a range of visual aids tailored for illiterate populations. The intervention is standardized through a detailed technical guide. It includes scripts and key messages for each theme and each activity. It also provides detailed implementation modalities. The technical guide aims to ensure consistency during implementation at scale, as well as to facilitate quality control and monitoring by the government program team.

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<sup>11</sup> To alleviate concerns about the number of messages (Vazir et al., 2013), they were designed to be introduced progressively, covering successively nutrition, health, psycho-social stimulation and protection. One new message or theme is introduced each month and is emphasized through all program activities that month. The message is then repeated periodically in subsequent months.



The implementation of the behavioral change component was closely monitored. In addition to quality control by program staff, two qualitative process evaluations were undertaken. The quality of implementation was found to be satisfactory overall, though the content and duration of home visits varied. Participation in community assemblies, small-group meetings and household visits was monitored, and captured monthly for each beneficiary in an information system held by the implementing agency. Participation was consistently above 90%.

The behavioral accompanying measures were designed as a relatively low-cost intervention to ensure the feasibility of its implementation at scale. Their cost is estimated at \$100 per direct cash transfer beneficiary household, or approximately 20% of the cash transfer amounts. Total implementation costs are estimated at \$86 per direct cash transfer beneficiary household, and indirect oversight costs at \$14.

### **3. Experimental Design and Data**

#### **3.1 Experimental Design**

The study was designed as a multi-arm clustered RCT to disentangle the impact of the behavioral change parenting intervention from cash transfers. The RCT was embedded in the first phase of implementation of the program in 6 communes of the regions of Dosso and Maradi.<sup>12</sup> Geographical targeting was used to select the poorest communes to participate in the cash transfer program. In absence of fine-grained poverty maps, communes were selected through a participatory process considering available information on poverty levels, chronic vulnerability and local infrastructure. This was done during local meetings with regional leaders and commune mayors. As such, the selected communes were those considered the most disadvantaged by regional and communal authorities.

In the six selected communes, public lotteries were used to select beneficiary villages among all villages.<sup>13</sup> Prior to performing the public lotteries, small villages were grouped with neighboring villages to form

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<sup>12</sup> The national cash transfer program was originally designed to be implemented over several phases in the 5 regions (Dosso, Maradi, Tahoua, Tillabery, and Zinder) that present the highest concentration of poverty in Niger and where 95 percent of the country's poor population lives. The first phase targeted the regions of Dosso and Maradi, which contain 40% of the country's poor population (World Bank, 2011). Over time, the Niger cash transfer program expanded to reach all 8 regions of the country.

<sup>13</sup> The villages in the study sample are representative of the villages in the 6 communes. Given the difficulty to find transparent targeting criteria to prioritize villages within communes, the program team decided to implement public lotteries to select beneficiary villages among all equally eligible villages. Authorities and program staff appreciated the transparency of the selection process, so that the project staff later continued to use public lotteries to select villages in communes outside the evaluation sample.

clusters for operational reasons.<sup>14</sup> The randomization was performed by clusters and stratified between nomadic and sedentary clusters.<sup>15</sup>

The randomization was undertaken in two steps. First, a public lottery randomly selected treatment and control clusters among all eligible clusters in the 6 targeted communes. In total, 152 clusters (215 villages) were drawn, including 100 treatment clusters (142 villages) and 52 control clusters (73 villages). After cash transfers started, a second public lottery was undertaken to assign treatment clusters to receive either the cash transfers only (CT, 50 clusters, 70 villages), or the cash transfers plus the behavioral change component (CT + BCC, 50 clusters, 72 villages).<sup>16</sup>

### 3.2 Baseline Sampling, Data and Timeline

After the first public lottery, a door-to-door listing of households was undertaken in all villages drawn into the sample. The sample for the baseline survey was drawn from that household listing by taking a random sample of 30 households per village,<sup>17</sup> after excluding ineligible households with high self-reported income. Specifically, the listing form included a question on self-reported household income, which was used by the program as an “exclusion criterion” to rule out ineligible households. The baseline sampling frame includes all households that did not self-report income above a cut-off during the listing. These are the same households that are later considered for inclusion in the targeting (PMT) data collection used to make program selection decisions (as explained further below).<sup>18</sup> In the end, the study sample is

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<sup>14</sup> Small villages were grouped with neighboring villages based on geographical proximity. This was done because the program management team was concerned that a village-level randomization would lead them to operate in very small villages that could have been highly dispersed. The grouping was done based on population estimates available at the time of the randomization. In practice, 100 out of 152 of clusters only include 1 village. On average, a cluster includes 1.4 village. Table S1 provides information on each cluster in the sample by showing the number of villages per cluster as well as number of households identified during a household listing (described in section 3.2).

<sup>15</sup> Public lotteries took place in presence of village chiefs, commune authorities and program staff. 28 of the 152 clusters were classified as nomadic.

<sup>16</sup> Two nomadic clusters (one control and one CT+BCC treatment cluster) were originally drawn into the evaluation sample but had to be dropped from the baseline survey due to communities being entirely inaccessible. One of the two clusters could be added back into the sample at follow-up as part of the additional booster sample (described in Section 4.2). Results are robust when excluding nomadic clusters.

<sup>17</sup> When the household sample was drawn, 3 small villages (2 in control clusters and 1 in a CT+BCC treatment cluster) had no observation drawn into the sample. A few small clusters of less than 30 households remained, particularly in nomadic villages.

<sup>18</sup> The exclusion criterion was chosen by the program team to reduce the list of households for which PMT data had to be collected to select households for the program. Given potential incentives to under-report income, the program team considered that households who reported income above a certain threshold could safely be considered as having high income. As such, the use of this screening criteria is unlikely to create *exclusion errors*. It is of course possible that some households under-reported their income, and this is why a PMT data collection was subsequently undertaken to select beneficiaries with the lowest PMT scores, which can be considered as addressing potential *inclusion errors*. Out of 26,842 households listed, 3,870

representative of 86% of households in sample villages that are considered for targeting (PMT) data collection, after excluding the 14% of households that are ineligible due to high self-reported income (and for which we do not have PMT or baseline data). Note that the baseline sampling procedure was implemented similarly across the treatment and control groups, and we show below that the samples are well-balanced at baseline (see Section 4.4).

The baseline survey was collected between April and June 2012 (see Figure 1 for an overview of the study timeline) in a sample of 4,330 households that included 6,132 children aged 6-59 months. It included a household questionnaire and a questionnaire on children aged 6 to 59 months. The child survey built on the Niger DHS/MICS questionnaire. It contained modules on nutrition and food security, parenting practices, as well as anthropometric measures. It also included a cognitive test adapted by Zeitlin and Barry (2008) to measure cognitive development among young children in West Africa. The test is an adapted version of the Bayley<sup>TM</sup> cognitive scale, discussed further in Section 4.5 below.<sup>19</sup> The household survey instrument built on the 2011 Niger LSMS-ISA national household survey questionnaire, including a full consumption module and a food security module to calculate dietary diversity measures such as the household food consumption score, discussed further in Section 4.6 below.

Following the baseline survey, targeting data was collected in treatment villages to calculate a proxy-means test (PMT) score for each household.<sup>20</sup> The application of the proxy-means test aimed to identify the poorest households that would be selected as beneficiaries for the cash transfer program. A selection threshold was set for each commune, so that approximately the 40% poorest households would be selected to participate in the cash transfer program.

After the baseline survey was completed, targeting data collected, and the second public lottery implemented, the baseline survey was merged with targeting data from the cash transfer program to identify which households from the baseline sample were selected as beneficiaries. In treatment villages,

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(or approximately 14%) were deemed ineligible and excluded from the PMT data collection and the program. In the listing, self-reported income was measured through a categorical variable, so that there is unfortunately little variation to analyze.

<sup>19</sup> In practice, household and child survey teams followed each other in the field. Household survey teams were responsible for referring children eligible for the child survey to the child survey teams. To ensure a smooth transition between the two surveys, the household survey teams pre-filled information on household location and children's identification in the child questionnaire, before passing them to the child survey team. Child survey teams were then responsible to verify children's age and collect data for all children identified by the household survey team. Data collection for the child survey took place in the household through interviews with the main caregiver for each child. The anthropometric measurements and cognitive test took place in presence of the caregiver. Thorough quality control procedures were put in place, with systematic verifications of questionnaires by enumerators and supervisors. Additional verifications, including random back-checks, were undertaken by the coordination and quality control teams throughout the survey.

<sup>20</sup> This was done for households that passed the exclusion criterion, as explained in footnote 18.

we can thus identify households that are actual program beneficiaries, and households that are actual non-beneficiaries. Table A1 documents the baseline characteristics of households selected for the program (with a PMT score below the selection threshold) or not (with a PMT score above the selection threshold) in treatment villages. Beneficiary households are on average larger and have lower total consumption, food consumption and non-food consumption per capita than non-beneficiary households. Children in beneficiary households also tend to have lower weight for age and dietary diversity at baseline.<sup>21</sup>

The interventions were implemented between February 2013 and April 2015. Program implementation was closely monitored. The delivery of the monthly cash transfers started in February 2013 in the Dosso region and in March 2013 in the Maradi region. Cash transfers were delivered monthly until the final payments took place (in March 2015 in Dosso and April 2015 in Maradi). More than 98% of households selected for the cash transfer program received benefits. The behavioral change promotion measures were rolled out between April 2013 and March 2015. Even though it was not compulsory, participation in the behavioral accompanying measures was very high. The average attendance rate among cash transfer beneficiaries was 92%. Substantial participation of non-beneficiaries was also observed in assemblies held in beneficiary villages.<sup>22</sup>

The follow-up survey was collected between mid-January and mid-May 2015. The follow-up sample included 5,011 households, of which 4,818 households (with 6856 children) were tracked and interviewed, a response rate of 96.1%.<sup>23</sup> We detail the sampling for the follow-up survey in relation to the estimation strategies in Sections 4.1 and 4.2 below.

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<sup>21</sup> Premand and Schnitzer (2021) provide a detailed analysis of the performance of proxy-means targeting in a subsequent phase of the program.

<sup>22</sup> A participation rate for non-beneficiaries cannot be calculated as their participation was not recorded nominally. We discuss this further in Section 7.

<sup>23</sup> The follow-up survey used the SurveySolutions electronic data collection platform. Questionnaires with pre-filled data were downloaded from an online server onto supervisors' laptops, and later transferred to enumerators' tablets. Consistency checks were integrated in the Surveysolutions CAPI application installed on enumerators' tablets. Upon completion of the questionnaires and synchronization back to supervisors' laptops, supervisors were responsible for validating questionnaires before uploading them to the server. A dedicated team of quality controllers verified the data once uploaded to the server. Automated consistency checks were also performed. As for the baseline survey, household and child survey teams followed each other in the field. Household survey teams were responsible to identify children eligible for the child survey. The list of children obtained by the household survey team provided the sample for the child survey. To ensure a smooth transition between the two teams, the list of children was extracted by the coordination team from the household data uploaded on the server (after verification). The pre-filled child questionnaires were then downloaded onto the child survey supervisors' laptops, before being transferred to enumerators' tablets. Child survey teams were responsible for verifying children's age for all children identified by the household survey team and collecting data for all children in the appropriate age range. Thorough quality control procedures were put in place, including through automated checks on the tablets, as well as systematic

The follow-up survey again included two separate instruments: a household survey and a survey for children aged 6 to 59 months at follow-up. The household and child survey instruments were based on the baseline survey questionnaires. The child questionnaire collected information on child nutrition and a dietary diversity measure specific to each child. It also included anthropometric measurements for children 6-59 months old as well as the cognitive development test for children below 42 months. In addition, the strengths-and-difficulties questionnaire was introduced to measure socio-emotional development for children 24-59 months old (Goodman, 1997). When collecting child survey data, the brachial perimeter was measured for adult female caregivers who were breastfeeding or pregnant at the time of the survey. The household questionnaire included a full consumption module and a dietary diversity module.

#### **4. Estimation Strategy**

##### **4.1 Intent-to-treat estimates for predicted beneficiary households**

The study is designed to assess the relative effect of the behavioral change component and cash transfers in improving parenting practices and children’s human capital. We obtain intent-to-treat estimates of the impacts of the two interventions on households that have a (baseline) PMT score below the program selection threshold. The targeting data collected to calculate the PMT scores used to make program selection decisions could only be collected in treatment villages. The baseline survey was thus designed to also calculate PMT scores in both treatment and control villages. As such, we can apply the PMT formula to the baseline data to “predict” potential beneficiary status for of all households in the sample.

The effect of the cash transfers can be separated from the effect of the behavioral change component by comparing “predicted beneficiaries” in the treatment and control groups. ITT estimates are obtained through the following regression model based on follow-up data on the sub-sample of “predicted beneficiary households” (PB=1) with a (baseline) PMT score below the program selection threshold:

$$Y_i = \alpha \text{CASH}_i + \beta \text{BCC}_i + \delta Z_i + \varepsilon_i, \text{ for } PB=1 \quad (1)$$

$i$  refers to an individual or household (depending on whether the outcome of interest is a household-level or individual-level outcome),  $Y$  is the outcome of interest, CASH takes the value of 1 for villages randomly

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verification of data collected by enumerators and supervisors. Additional verifications, including automated back-checks, were undertaken by the coordination and quality control teams once data were uploaded to the server.

assigned to the cash transfer program (in either of the two treatment arms),  $BCC$  takes the value of 1 for cash transfer villages randomly assigned to the behavioral change component,  $Z$  is a set of randomization strata fixed effects, and  $\varepsilon$  is the error term. Robust (White-Huber) standard-errors are clustered. We also report the p-value from a F-test for the significance of the overall CASH + BCC treatment effect ( $\alpha + \beta = 0$ ) in villages assigned to cash transfers and behavioral change promotion, as well as for a test of equality of the CASH and BCC treatment effects ( $\alpha - \beta = 0$ ).

In addition to reporting robust (White-Huber) clustered standard errors and related asymptotic p-values, we report the exact p values from a randomization-t test. Following Young (2018), the exact p-values are obtained from 2,000 simulations and take into account the stratified randomization.<sup>24</sup> While in principle the exact p-values could be more conservative since our design involves clustered randomization, the size of the experiment is not small and in practice the exact p values are close to the asymptotic p values. We also report joint test of significance of treatment effects based on Young (2018).

Specification (1) should be interpreted as providing intent-to-treat estimates. The prediction of beneficiary status based on the baseline survey is imperfect as the groups of actual beneficiaries and “predicted beneficiaries” do not fully overlap in treatment villages. Figure 2 illustrates that the PMT score from the targeting data determines actual beneficiary status in treatment villages: the probability of being a beneficiary drops sharply around the selection cut-off. This shows that the PMT selection procedure was faithfully implemented based on the targeting data. However, the “predicted” PMT score based on the baseline survey does not perfectly match the PMT score from the targeting data: the likelihood of being predicted beneficiary is strongly associated with the PMT score from the targeting data, but no sharp drop is observed at the cut-off.<sup>25</sup>

The follow-up sample was stratified based on the proxy means test score “predicted” from the baseline survey.<sup>26</sup> 377 households from the baseline sample (with high predicted PMT scores, hence low likelihood

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<sup>24</sup> We report the randomization-t test as Young (2018) shows it is superior to the alternative randomization-t statistic.

<sup>25</sup> This is likely due to measurement errors in the variables that enter the PMT score calculation (possibly in both the targeting data and baseline household survey). For instance, defining household units in the context of large, frequently polygamous households in rural Niger is challenging, and some discrepancies in the application of these definitions may have taken place between surveys. This measurement error likely reflects teething pains during the establishment of the Niger safety net system, including with the quality of large-scale targeting data collection in a context characterized by low administrative capacity. Indeed, the PMT targeting was shown to be relatively efficient and to suffer from little measurement errors in subsequent phases of the program (Premand and Schnitzer, 2021).

<sup>26</sup> All the households with a proxy means test score below 1.05 times the beneficiary selection threshold were sampled at follow-up, while half the households with a proxy means test score above 1.05 times the beneficiary selection threshold were sampled. Stratification was based on the PMT score “predicted” from the baseline survey so that the sampling process would remain similar in the treatment and control group.

of being selected as beneficiaries) were dropped from the follow-up sample.<sup>27</sup> We include sampling weights when estimating specification (1) to account for sample stratification at follow-up, and to ensure results are representative of the overall population of households considered for the program in sample villages.<sup>28</sup> Separately, an additional booster sample of 1,058 beneficiary households was randomly drawn from the administrative database of beneficiaries and added to the follow-up sample, which we elaborate upon when discussing specification (2) in section 4.2 below. This booster sample is not used in specification (1).<sup>29</sup>

Table 1 provides the composition of the follow-up sample by predicted and actual beneficiary status. The top panel of Table 1 provides the break-down of baseline observations in “predicted” beneficiary households across the treatment and control arms.<sup>30</sup> Specification (1) compares outcomes for the 1685 households or 2640 children between cells A, B and C. In the treatment group, 55% of predicted beneficiaries (based on the baseline PMT score) are actual beneficiaries (of the cash transfers and BCC interventions), so that ITT estimates are to be interpreted accordingly. On average, 44.2% of households in the sample are predicted beneficiaries at follow-up ( $1685/3811=44.2\%$ , shown in cells A, B and C in table 1). This is similar to the share of baseline households interviewed at follow-up that are actual beneficiaries in the treatment group ( $1098/1473=42.7\%$ , shown in cells D and E in Table 1).

Specification (1) focuses on households predicted to be beneficiaries in a context where the program targeted 43% of households across treatment villages. As a robustness check, we also obtain village-level ITT effects by estimating equation (1) among all households, irrespective of whether they are predicted beneficiaries or not.

#### 4.2 BCC effects on actual beneficiary households

Since we observe actual cash transfer beneficiary status in the two treatment arms, we can also obtain precise estimates of the value-added of the behavioral change parenting intervention for actual cash

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<sup>27</sup> The distribution of these 377 households was balanced between the two treatment and control groups.

<sup>28</sup> We multiply the follow-up sampling weights by the number of households for which the PMT data is collected in each cluster (projected from the listing data).

<sup>29</sup> Predicted beneficiary status cannot be estimated for households in the booster sample since they were not interviewed at baseline. This is why booster sample households are not included in any of the specifications involving comparisons with the control group.

<sup>30</sup> Table S2 details the break-down of the number of actual beneficiaries and predicted beneficiaries separately for each cluster.

transfer beneficiary households. We consider this a robustness check of the ITT estimates for the BCC treatment effects in specification (1).

We estimate the value-added of the BCC component for cash transfer beneficiaries by comparing outcomes between actual cash transfer beneficiary households in villages assigned to CASH or CASH and BCC. This estimate is obtained through the following regression model excluding observations from the control group:

$$Y_i = \gamma BCC_i + \delta Z_i + \varepsilon_i \quad , \quad \text{for } C=0 \text{ and } B=1 \quad (2)$$

$i$  refers to an individual or household (depending on whether the outcome of interest is a household-level or individual-level outcome),  $Y$  is the outcome of interest,  $BCC$  takes the value of 1 for cash transfer villages randomly assigned to the behavioral change component,  $Z$  is a set of randomization strata fixed effects, and  $\varepsilon$  is the error term.  $C$  takes the value of 1 for observations in the control group, 0 otherwise.  $B$  captures the actual beneficiary status from the cash transfer program. Robust (White-Huber) standard-errors are clustered.

As mentioned in section 4.1., the sampling strategy for the follow-up survey was designed to oversample actual program beneficiaries in the treatment villages by adding a booster sample of 1,058 beneficiary households across the two treatment groups. This was done to ensure sufficient statistical power to detect impacts of the behavioral intervention in the sub-sample of beneficiary households used in specification (2).<sup>31</sup> To maximize power, the estimation of specification (2) is thus undertaken by including observations from the booster sample. In Table 1, it relies on 2105 households and 3265 children by comparing outcomes between observations in cells D and F with observations in cells E and G.<sup>32</sup> We

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<sup>31</sup> The addition of a booster sample was decided at the study design stage. One of the concerns during study design was that the BCC may induce small effects that could have gone undetected if the sample of beneficiary households was not sufficient. Since the targeting was done after baseline, it would have been prohibitively expensive to expand the size of the baseline sample to increase the number of households expected to be selected as beneficiary. (It would have required adding an expected 1.5 non-beneficiary household to the sample per additional beneficiary household). As such, power calculations were performed to identify the size of the booster sample that could be added at follow-up to maximize power given budget constraints, to ensure that the study would be able to detect smaller effects of the BCC intervention that may still be relevant. Specifically, with 10 beneficiary households per cluster at baseline, the study could detect changes of 0.22 standard deviations with a power of 0.8 for an ICC of 0.05. With an increase target sample of 24 beneficiary households per cluster, the study was powered to identify changes of 0.17 standard deviations with a power of 0.8 and an ICC of 0.05. In practice, the actual sample is slightly lower (due to attrition), with approximately 20 beneficiary households per cluster after addition of the booster sample (cells D, E, F and G in the middle panel of table 1), leading to a minimum detectable effect of 0.18 standard deviations.

<sup>32</sup> We also provide a robustness check by considering actual beneficiaries from the baseline sample only (comparing only observations in cells D and E in Table 1).



include sampling weights in our estimation to ensure results are representative of the population of cash transfer beneficiaries.<sup>33</sup>

Note that the specification in equation (1) is written as a nested model, whereby CASH = 1 for predicted beneficiary households in any of the treatment groups, and BCC=1 for predicted beneficiary households in the treatment group assigned to cash transfer and BCC. This specification implies that the estimates of  $\gamma$  in equation (2) and of  $\beta$  in equation (1) both capture the value-added of the behavioral change component. The consistency of estimates for the two specifications provides an indication of the robustness of the results.

Specification (1) provides intent-to-treat (ITT) estimates for the relative effect of the behavioral change and cash transfer interventions on predicted beneficiary households. In contrast, specification (2) provides estimates of the treatment effects (or value-added of the BCC intervention) on cash transfer beneficiaries. While both sets of estimates are unbiased, they are obtained for different subpopulations. If the population of “predicted beneficiary households” was the same as “actual beneficiary households”, the two sets of estimates would be the same (similar to a standard case of full compliance). If the two populations do not fully overlap, the intent-to-treat estimates would average treatments effects across all predicted beneficiary households, irrespective of their actual beneficiary status. In general, we would expect point estimates from specification 1 to be of smaller (absolute) magnitude than point estimates from specification 2. Local spillovers on non-beneficiaries may attenuate this difference, and we now turn to discussing how we can identify local spillover effects from the BCC intervention.

#### 4.3 Local BCC Spillovers on actual non-beneficiary households

Based on randomized assignment of villages to the two treatment arms, we can identify the local spillovers of the behavioral change component on households that do not benefit from cash transfers within treated villages. To do so, we compare outcomes between households that are (actual) non-beneficiaries of cash transfers in villages assigned or not to BCC. We obtain estimates of local BCC spillovers based on the following regression:

$$Y_i = \psi BCC_i + \delta Z_i + \varepsilon_i \quad , \quad \text{for } C=0 \text{ and } B=0 \quad (3)$$

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<sup>33</sup> We multiply the follow-up sampling weights by the number of beneficiary households in each cluster.

Specification (3) provide precise and unbiased estimates of local spillover effects of the BCC intervention among cash transfers non-beneficiaries. This specification relies on comparing outcomes for the 1447 households or 1867 children between cells I and G in the bottom panel of Table 1. We include sampling weights to ensure results are representative of the population of non-beneficiaries in cash transfer villages.<sup>34</sup>

Note that the spillovers are not estimated on the full population of non-beneficiary households, but rather on the sub-set of non-beneficiary households that were considered for inclusion in the targeting (PMT) data collection. As such, they exclude the 14% of households with high self-reported income who were excluded from the PMT data collection (as per discussion in Section 3.2). The estimates from specification 3 should thus be considered as capturing local spillover effects on the poorest households (based on self-reported income) not selected for cash transfers in treatment villages. We provide additional discussion on spillover pathways in Section 7.

#### 4.4 Baseline Balance

Table 2 documents baseline balance for households surveyed at follow-up. Panel A considers all baseline households surveyed at follow-up. Panel B focuses on predicted beneficiaries when applying the PMT targeting formula on baseline data (similar to specification (1)), and Panel C on actual beneficiaries (as in specification (2)). Balance is documented for variables from the household survey (top panel, first for household-level variables, then for individual-level variables), as well as variables from the child survey (bottom panel). Results show that the randomization achieved baseline balance between control and treatment groups in the full sample, in the sample of predicted beneficiaries used for specification (1), as well as between actual beneficiaries in the two treatment groups used for specification (2). Observed differences are not more frequent than would be expected, and generally either weakly significant or of small magnitude (less than 10% of the mean in the control group). One meaningful exception is that children aged 0-4 and 5-14 are more likely to be reported sick in the month prior to the baseline survey in the control group. We return to this when discussing the interpretation of the results. Overall, baseline balance indicates that the randomization was implemented properly, and that the sampling procedures were also consistently implemented across the control and treatment groups. Program impacts can thus

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<sup>34</sup> We multiply the follow-up sampling weights by the number of non-beneficiary households in each cluster.

be identified at follow-up through single differences in outcomes across the various treatment and control groups based on the specifications discussed in Sections 4.1-4.3.

#### 4.5 Parenting Practices and Children's Human Capital Outcomes

The BCC intervention aims to induce behavioral changes among cash transfer beneficiaries in four main domains: nutrition, health, psycho-social stimulation and child protection practices. As such, we first test whether the interventions lead to changes in practices in these four domains. They represent intermediary outcomes that capture behaviors directly promoted by the program. We then consider whether the interventions affect final (or downstream) outcomes capturing children's human capital, including anthropometrics, cognitive development and socio-emotional development.

To analyze whether the interventions trigger behavioral change, we build indices by aggregating indicators for the practices that were promoted in each domain. The consideration of these families of outcomes helps to address potential concerns about multiple hypothesis testing, in addition to the exact p-values discussed in Sections 4.1-4.3. We build additive indices of z scores, standardized in the control group.<sup>35</sup> We provide disaggregated results for the individual components of the indices in the annex to facilitate the interpretation of the results.

*Nutrition practices (Intermediary outcome domain #1).* The BCC intervention promotes exclusive breastfeeding until 6 months of age and encourages greater diversity in children's diet after 6 months. Therefore, we construct an index of nutrition practices for children aged 12-23 months, which captures (i) whether infants were exclusively breastfed until 6 months, and (ii) the number of types of foods each child started to consume between 6 and 9 months old, which measures food supplementation. We then analyze the food consumption score for all children 6-59 months old, which provides a measure of dietary diversity that is measured specifically for each child at the time of the follow-up survey (WFP, 2008).<sup>36</sup>

*Health practices (Intermediary outcome domain #2).* The BCC intervention promotes preventive health behaviors to protect children against disease, as well as encourages health service utilization at the first sign of illness. We build an index of preventive health behavior capturing whether children have (i)

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<sup>35</sup> Note that we standardize indicators with respect to the full control group surveyed at follow-up (and using the follow-up sampling weights). When estimations are based on part of the sample only (such as predicted beneficiaries as in specification 1), the mean in the reference group displayed in the result tables may slightly deviate from 0.

<sup>36</sup> The food consumption score captures dietary diversity based on a set of questions asking about the consumption frequency of different food groups during the past seven days. This indicator is the primary dietary diversity measure used by humanitarian actors working on food insecurity in the Sahel.

received all their vaccines, (ii) received vitamin A, (iii) received iron supplementation, (iv) received deworming, (v) slept under a treated mosquito net, as well as (vi) an index capturing the frequency at which the main caregiver washes hands. We then analyze impacts on children's illness, as reported by the main caregivers, before reporting results on health center utilization. While children's illnesses could be interpreted as a final outcome, we report their incidence along with other intermediary outcomes in the health domain because health center utilization is measured conditionally on reported illness.

*Stimulation practices (Intermediary outcome domain #3).* The BCC component encourages psycho-social stimulation through language and play. We build two indices based on items capturing the family care environment in MICS surveys. The first index captures the frequency at which children have interactions with adults through activities such as reading, storytelling, going out together, playing, naming, counting or drawing. The second index captures the number of types of toys children play with, including home-made toys, manufactured toys, household objects, animals, toys that can be pulled, and balls.

*Child protection practices (Intermediary outcome domain #4).* The BCC component promotes positive disciplining to manage conflict and avoid harsh punishments. It also encourages birth registration. We first build an index aggregating positive disciplining behavior (explain or redirect) minus negative disciplining behavior (forbid, shake, yell, spank, spank with an object, berate, slap, hit on the hands, and hit with an object). Second, we record whether children have a birth certificate.

Ultimately, we are interested in testing whether the promotion of behavioral change in parenting practices contribute to improve human capital outcomes among young children. We consider final (or downstream) outcomes in three domains: anthropometrics, cognitive development and socio-emotional development. We again measure indices for each set of outcomes.<sup>37</sup>

*Anthropometrics (Final outcome domain #1).* We measure height-for-age (used to characterize stunting), weight-for-height (used to characterize wasting) and weight-for-age (used to characterize underweight) z scores for all children aged 6-59 at the time of the follow-up survey.<sup>38</sup>

*Cognitive development (Final outcome domain #2).* We implement a cognitive test adapted by Zeitlin and Barry (2008) to measure cognitive development among young children in West Africa. The test is a version

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<sup>37</sup> The indices are standardized for the control group. Since the distribution of anthropometric measures have long tails, we trim the top and bottom 2% to rule out outlier effects. We perform robustness checks for alternative treatment of outliers in the annex.

<sup>38</sup> We present heterogeneity analysis by age in Section 6.4.

of the Bayley™ cognitive scale adapted to West Africa.<sup>39</sup> The baseline survey was the first time that such a test was implemented in a large population in Niger. The test displayed appropriate reliability and validity in both the baseline and follow-up sample. The baseline cognitive score is correlated with both nutritional status and stimulation practices, suggesting sensitivity to factors known to be associated with cognitive development.<sup>40</sup> We report results with the scores normalized based on an international norm.<sup>41</sup> Cognitive scores are measured as z scores for children aged 6-42 months at the time of the follow-up survey.

*Socio-emotional development (Final outcome domain #3).* We build a z score for an index of socio-emotional development based on the strength-and-difficulties questionnaires for children aged 24-59 months at the time of the follow-up survey. The overall score aggregates sub-scales on emotional problems, conduct problems, hyperactivity, peer problems, and pro-sociality. The overall scale is scored so that a higher score indicates that a child has less socio-emotional difficulties.

#### 4.6 Household-Level Outcomes

We measure a range of *outcomes* at the household level to analyze additional mechanisms (Section 6). First, the household survey includes a food security module similar to the one in the child's survey, but asked to the head about the household. This module can be used to compute a household food consumption score and a household dietary diversity score, and as such it complements the analysis of nutrition practices and dietary diversity among children. We also consider the brachial perimeter for pregnant or breastfeeding women. Second, we document changes in household consumption (separately for total, food and non-food consumption), as well as the share of food in total consumption. To analyze within-household re-allocations between children and adults, we isolate a subset of items from the nonfood consumption aggregate that are privately consumed by adults (such as clothes or shoes), and a subset of similar items privately consumed by children. Third, we document impacts on assets (separately

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<sup>39</sup> The cognitive scale consists of 91 items ordered by increasing difficulty. The test begins at a standard ("basal") test item determined by the child's age. In case the child does not pass the first three test items administered, the examiner goes back up to the next previous basal item (which is also the starting point for a younger age group) and continues going back until the child passes three consecutive basal items. The examiner then continues with the following items. The test is stopped when the child fails to pass five items in a row. The total raw score for an individual child is constructed as the sum of the items passed. The raw score can be transformed into a normed score based on norms established for the original version of the test. The normed score is calculated by each age and is standardized to have a mean of 10 at each age.

<sup>40</sup> At the same time, it should be noted that the correlation with such environmental factors does not appear as strong as in some other settings.

<sup>41</sup> Results are robust when using the raw score, or a score based on locally constructed norms.

for the number of household durable goods, household productive assets, as well as a livestock index expressed in tropical livestock units) and savings (whether households participated in a rotating savings groups, and the amount contributed over the last week). Lastly, we measure impacts on human capital variables for older children and household members, including school enrollment, attendance, illness and health service utilization for older children and adults, as well as use of contraception and recent pregnancies among women aged 15-49.

## **5. Results**

### **5.1 Behavioral Changes in Parenting Practices**

Table 3 presents ITT estimates of the impact of cash transfers and behavioral change promotion on intermediary outcomes that capture parenting practices in four main domains: nutrition, health, stimulation and child protection. ITT estimates for predicted beneficiary households are obtained from specification (1).

The behavioral change component triggers broad changes in parenting behaviors. First, in the nutrition domain, the BCC intervention improves the nutrition practice index for children aged 12-23 months by 0.29 standard deviations (statistically significant at the 10 percent level). Improved dietary diversity is also observed among all children aged 6-59 months old: the food consumption score increases by 0.24 standard deviations, showing that children consume more varied food.

Second, in the health domain, the BCC intervention improves the index of preventive health behavior by 0.24 standard deviations. This is related to higher vitamin intake and iron supplementation, as well as handwashing (Table A2). Utilization of health services conditional on being sick also increases by 8 percentage points, a 13 percent increase (statistically significant at the 10 percent level).

Third, in the stimulation domain, the BCC intervention improves the stimulation index by 0.36 standard deviations. This stems from more frequent caregiver-child interactions around activities such as storytelling, playing, counting, drawing or going on walks (Table A3). The stimulation material index also increases by 0.21 standard deviations, which shows that children play with a higher diversity of toys (including manufactured toys and balls).

Fourth, in the child protection domain, the BCC intervention leads to improvements in the disciplining index by 0.21 standard deviations. This is driven by a decrease in harsh disciplining (berating or slapping), although such practices are still reported frequently in the sample (Table A4). No significant increase in

the use of positive disciplining strategies is observed, however. No impact is observed on the share of children with a birth certificate either.

The results based on specification (1) (shown in Table 3) are robust when using specification (2) to isolate the value-added of the behavioral change promotion on cash transfer beneficiaries<sup>42</sup>: Table A6 shows consistent improvements in nutrition practices, dietary diversity, preventive health, utilization of health services, stimulation and discipline.<sup>43</sup> While results are highly consistent between specification (1) and (2), we note a few differences in statistical significance levels: specification (2) shows a statistically significant decrease in child illness, consistent with improvements in preventive health practices, while the point estimate for the stimulation material index is positive but not statistically significant. A few differences are also observed in the statistical significance of some components of the indices (Tables A8-A10). For instance, a statistically significant increase in exclusive breastfeeding is only observed in specification (2).

As discussed in Section 4.2, estimates of BCC average treatment effects on cash transfer beneficiaries based on specification (2) can be considered more precise than ITT estimates in Table 3 due to higher statistical power. We nevertheless take a conservative approach and only consider them as a robustness check since they rely on a booster sample for which we do not have data to document baseline balance.

Overall, the results document that the BCC intervention induces wide-ranging changes in parenting practices and self-reported behaviors in various domains, as well as food security indicators measuring children's dietary diversity. While we cannot rule out some desirability bias in self-declared parenting practices, the results are based on a broad set of highly disaggregated survey questions and thorough quality control procedures were put in place during data collection (as detailed in Section 2). At a minimum, the results suggest strong changes in information and knowledge about parenting practices. The findings point to broad changes in parenting practices across domains, which may relate to more general evolution in norms on parenting practices in villages exposed to the behavioral change component. Consistent with this interpretation, we document local spillovers on parenting practices among non-beneficiary households in treatment villages in section 7 below.

In contrast with results for the BCC component, Table 3 shows that cash transfers alone do not lead to improvements in parenting practices in any dimension. None of the coefficients for the impact of cash

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<sup>42</sup> Results are also robust when estimating ITT at the village-level (Table A5).

<sup>43</sup> Table A7 shows results from specification (2) when excluding the booster sample. Results are again consistent (though at times more imprecise, as would be expected with a smaller sample, in particular for the sub-set of children aged 12-23 months old at follow-up).

transfers on parenting practices is statistically significant across the nutrition, health, stimulation and child protection domains. The only (marginally) significant coefficient suggests a higher prevalence of reported illnesses among children in villages assigned to cash transfers. This difference is best not overinterpreted given the baseline imbalance observed for this indicator. Overall, the results consistently show that cash transfers alone do not improve parenting behavior.

## 5.2 Children's Human Capital

We now test whether the interventions contribute to improve young children's human capital, including anthropometrics, cognitive and socio-emotional development.

ITT estimates from specification (1) show that the BCC intervention has no impact on anthropometrics (Table 4, columns 1-3). The coefficients are not close to showing improvements and are all very close to zero. As such, these null effects are not explained by statistical power. The results on the value-added of the BCC intervention for cash transfer beneficiary households are similar in specification (2), which maximizes statistical power (Table A11).<sup>44</sup> Despite improvements in nutrition and health practices, children from cash transfer beneficiary households who are exposed to the behavioral change intervention do not have better anthropometric outcomes than children in households receiving cash transfers only.<sup>45</sup>

Note that changes in practices (such as nutrition, complementary feeding or breastfeeding) could be beneficial in and of themselves, even in absence of short-term impacts on anthropometrics (Victora et al., 2016). Bhutta et al. (2008) show that education about complementary feeding can improve children's anthropometrics, but that effects are concentrated among populations having an income of 1\$ a day or more (for instance in countries such as Brazil, China or Peru). In a low-income setting with widespread prevalence of extreme poverty such as rural Niger, our results suggest that behavioral change promotion and related changes in nutrition practices are not sufficient to improve children's anthropometrics. We further discuss intra-household changes in dietary diversity and consumption in Section 6 below.

Cognitive development does not improve either (Table 4, column 4). The cognitive test indicates strong signs of cognitive delays among children at baseline, but the behavioral change intervention does not reduce these signs of delays. As for anthropometrics, the coefficient of interest is very close to zero and

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<sup>44</sup> Table A12 also shows robust results from specification (2) when excluding the booster sample.

<sup>45</sup> Similar results are obtained when estimating specification (1) with all households in the village (Table A13).



far from being statistically significant. Despite improvements in psycho-social stimulation and child protection practices, no impact on children’s cognitive development is observed. It is noteworthy that child stimulation activities are very limited in rural Niger. On average, household heads in the sample have 0.5 years of education. Reflecting this very low level of literacy, only 3% of children in beneficiary households are read stories. Other activities that promote school readiness (such as naming, counting or drawing) are also very infrequent. These patterns highlight challenges in fostering children’s cognitive development or school readiness given widespread illiteracy among parents. In this context, the behavioral accompanying measures lead to improvements in stimulation practices, but the impacts are of limited magnitudes and not sufficient to improve children’s cognitive development. Despite the observed impacts, there is substantial scope for additional enrichment in children’s psycho-social stimulation.

Lastly, the BCC intervention leads to moderate improvements in children’s socio-emotional development (Table 4, column 5): the socio-emotional development score improves by 0.13 standard deviations (statistically significant at 10 percent). Changes in child protection practices (disciplining) and in psycho-social stimulation may contribute to these observed gains in socio-emotional development.

Table 4 also shows that cash transfers alone do not induce improvements in anthropometrics or child development outcomes. The point estimates for cash transfer impacts on height for age, weight for age, the cognitive score and the socio-emotional score are negative and not statistically significant. These results clearly show that cash transfers alone do not improve children’s human capital in the study context. We cannot rule out that cash transfers may have adverse effects on children’s anthropometric outcomes.<sup>46</sup> However, given the higher incidence of disease among treated group children at baseline and the fact that height for age is generally considered as capturing a stock measure that is less malleable than weight for age or weight for height, we remain cautious not to overinterpret these patterns. We return to the discussion of mechanisms between behavioral change, cash transfers and children’s human capital in Section 6 below.

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<sup>46</sup> The treatment effect of cash transfers on height for age is negative and borderline statistically insignificant in Table 4. It becomes statistically significant when trimming the distribution at the 5<sup>th</sup> and 95<sup>th</sup> percentile or trimming using the interquartile range (see Table A14). Estimates from specification (2) are robust to alternative trimming (Table A15). The treatment effect of cash transfers on weight for age is negative in the village-level ITT specification in Table A13.

## **6. Additional Mechanisms and Discussion**

We now discuss additional mechanisms that may contribute to explain why the behavioral change and cash transfer interventions induce limited or no improvement in early childhood nutrition and development outcomes. We analyze changes in dietary diversity at the household level (Section 6.1), changes in consumption, including within-household allocations between adults and children, and assets (Section 6.2), impacts on human capital of other household members (Section 6.3) and heterogeneity in impacts of the BBC intervention (Section 6.4). Section 7 then discusses local spillovers of the BCC intervention within villages benefitting from cash transfers, which provides additional evidence on the mechanisms behind the results.

### **6.1 Changes in Dietary Diversity in the Household**

Table 5 shows how the interventions affect household consumption and food security indicators. It documents impacts on dietary diversity in the household (columns 1 and 2), which captures food security of other (adult) household members beyond just children, and on the brachial perimeter of breastfeeding and pregnant mothers (column 3). As mentioned in Section 5.1 and shown in Table 3 (column 2), the behavioral intervention improves dietary diversity among children, but the cash transfers do not. Table 5 (columns 1 and 2) reveals the opposite patterns at the household level. We can clearly reject that the behavioral change intervention improves household dietary diversity. Though not statistically significant, the estimated coefficients are negative. On the other hand, cash transfers induce significant improvements in dietary diversity at the household level (Table 5, columns 1-2), though it did not among children (Table 3, column 2). Neither of the two interventions achieves improvements in dietary diversity both at the household and child level.

These patterns suggest that cash transfers and behavioral change promotion have differential effects on intra-household allocations of food between adults and children. In particular, the behavioral intervention may induce some reallocation of food from adults toward children within the household. While all household members typically eat together for one or two meals a day, children also eat at other times when they are with their caregiver. Although the survey instrument does not directly attribute the consumption of food items to specific individuals within the household, this can explain why improvements in children's dietary diversity are not associated with improvements in other household

members' dietary diversity.<sup>47</sup> To speak more directly about potential within-household reallocations between adults and children, in the next section we isolate some (non-food) items that are privately consumed by adults, and some (non-food) items that are privately consumed by children.

## 6.2 Consumption and within-household reallocations between children and adults

Table 5 documents impacts of behavioral change promotion and cash transfers on household consumption (columns 4-10). The cash transfer and behavioral interventions have differential effects.

Cash transfers alone lead to a substantial increase in total household consumption per capita. This is explained by an increase in non-food consumption (including items such as clothes, shoes, pots or pans). The health and education expenditures also increase, which is almost fully driven by health expenditures, with only a small increase in education expenditures.<sup>48</sup> The observed increase in health expenditures is related to the higher incidence of disease in cash transfer villages compared to the control group, a variable in which there was imbalance at baseline, as noted above. Since no statistically significant impact on food consumption is observed, the differences in non-food consumption and health and education expenditures induce a decrease (by 5.6 percentage points) in the share of food consumption in total consumption among cash transfer beneficiary households. We do not find evidence that the interventions affect food prices in a way that would explain these results. There is no significant impact on the share of households reporting increases in food prices over the 12 months before the follow-up survey (Table 5, last column).<sup>49</sup>

The BCC intervention tends to offset the cash transfer impacts on non-food consumption. The BCC component induces a decrease in non-food consumption (statistically significant at 10 percent), which

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<sup>47</sup> Note that the behavioral intervention does not have a strong focus on mothers' nutrition (unlike Carneiro et al., 2021). Considering the large share of breastfeeding women and the generally poor nutrition outcomes in the sample, poor (or even worsening) dietary diversity among breastfeeding mothers may hinder improvements in children's anthropometrics.

<sup>48</sup> Specifically, the ITT estimate for the effects of cash transfers on health and education expenditures in Table 5 is 4,671.7 (s.e.=1469.6, mean in control=11462). The point estimate for health expenditures only is 4576.4 (s.e.=1466.6, mean in control=11111.7) and the point estimate for education expenditure is 95.3 (s.e.=51.8, mean in control=350). This, along with the broader set of results on parenting practices, children's nutrition and development, shows limited impacts of the cash transfer on children's human capital. Note that cash transfers do not improve education outcomes among older children in Table 7 either, as we discuss further in section 6.3.

<sup>49</sup> In addition, Table A17 tests for impacts on village-level prices for the products most frequently purchased in the follow-up survey (Panel A). No significant difference in prices is found. Note that the likelihood that food products are purchased by any household in the village is lower for some items in cash transfer villages (Panel B). Filmer et al. (2021) find that cash transfers have adverse effects on child nutrition by increasing prices of perishable goods in remote villages with a high program saturation. In our sample, cash transfer beneficiaries represent 43% of households in the village on average, and the saturation levels never reach those found in Filmer et al. (2021). We do not find price effects in villages with a higher share of beneficiaries either.

counterbalances the increase observed among cash transfer beneficiaries.<sup>50</sup> ITT estimates also suggest that the BCC component reduces cash transfer impacts on total consumption (though not statistically significant) and offsets the reduction in the food share of total consumption among cash transfer beneficiaries.

In the nonfood consumption aggregate, we can isolate some items that are privately consumed by adults, and some items that are privately consumed by children. For examples, our survey instrument records the purchase of clothes and shoes separately for adults and children. We find that cash transfers induce a statistically significant increase consumption of private adult goods, but not of private children's goods. Importantly, the BCC component offsets the increase in adult goods (significant at 10 percent), especially for women. This provides more direct evidence that the cash transfers are (at least partly) used for adult goods, which the BCC offsets. While we cannot attribute food consumption items to specific individuals, these non-food consumption patterns are consistent with our interpretation of the food security results as pointing to reallocations between adults and children within the household.

Table 6 provides results for assets and savings. Consistent with the behavioral intervention offsetting cash transfer impacts on non-food consumption, the BCC component induces lower accumulation of household durables relative to households receiving cash transfers only.<sup>51</sup> These results are consistent with lower investments in household durable goods among cash transfer beneficiary household assigned to the BCC component. Though more suggestive, they are also consistent with intra-household reallocation of resources between adults and children mentioned above. Few differential effects are found on savings or investment in productive assets (including livestock), aside from cash transfer beneficiaries being marginally more likely to save.

### 6.3 Human Capital of Other Household Members

Table 7 presents effects on human capital of other household members, including education and health indicators for older children and adults. Results are broadly consistent with the limited impacts found on younger children's human capital. The BCC intervention has some positive impacts on utilization of health services after illnesses for older children.<sup>52</sup> It does not however affect school enrollment or attendance, self-reported illness, or the share of adult women who are pregnant.<sup>53</sup> On the other hand, cash transfers

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<sup>50</sup> A similar pattern is observed for specification (2) in Table A16, though the coefficient is marginally insignificant.

<sup>51</sup> Similar results are found in Table A18 based on specification (2).

<sup>52</sup> Similar results are found in Table A19 based on specification (2).

<sup>53</sup> The lack of effect on fertility is not surprising given the limited time span of the intervention, but we report it for completeness since it was one of the topics covered by the BCC intervention.

alone do not lead to improvements in human capital among older children or adults either. A higher incidence of illness in cash transfer villages is again observed, similar to the baseline imbalances noted above. An increase in school absenteeism is also found. The use of contraception increases, though no effect on pregnancy is observed. Overall, results are consistent with cash transfers being mostly used for the purchase of non-food consumption items or small durable goods, as discussed in Section 6.2, with little investments in children's human capital.

#### 6.4 Heterogeneity in BCC Impacts on Children's Human Capital

The BCC intervention altered parenting practices but did not improve children's cognitive development or anthropometric outcomes. We now analyze heterogeneity in impacts on children's human capital to further shed light on underlying mechanisms. We focus on specification (2) since it maximizes statistical power and displays average impacts consistent with specification (1). The very low-income setting in which the study is conducted is worth underlining again. It implies that there is limited within-sample variation in some domains, which reduces the dimensions of heterogeneity that can be analyzed. For instance, in our sample, only 8 percent of mothers have ever been to school. In addition, the demographics are noteworthy, with women having children early and frequently. As a result, only 9 percent of children in our sample are first children. There are nevertheless a range of relevant heterogeneity dimensions we can explore. Overall, we do not find strong patterns of heterogeneity. The limited impacts on children's human capital hold across subgroups in the sample.

We first analyze heterogeneity by children's characteristics (gender and age) in Table 8 (Panel A and B). We do not find significant heterogeneity by age when distinguishing between children aged 0-2 and older children<sup>54</sup> (Panel A). We find some evidence that impacts on boys may be larger in some dimensions than impacts for girls. The impact on weight for height is marginally significant and negative for girls. While it is larger for boys, it is still not significant and mostly offsets a lower average weight for height for boys compared to girls in the control group. Impacts on socio-emotional development are driven by boys. These patterns of heterogeneity suggest that the limited observed impacts on human capital are concentrated among boys. While this further points to intra-household reallocations, the differences remain limited.

In Table 8 (Panel C), we analyze heterogeneity by whether the child's mother is the first wife of the household head. BCC impacts may be stronger for children whose mother is a first wife because she is the recipient of the cash transfers and is directly targeted for BCC activities such as village assemblies, small

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<sup>54</sup> This break-down is natural both because children aged 0-2 were exposed to the intervention most (and often all) of their life, but also because the first 3 years of life has been highlighted as the key window for early childhood development.

group meetings or household visits. Results do not show robust heterogeneity between children within beneficiary households. Impacts on children's human capital do not vary between children of the first wife or other wives in the household. Overall, not seeing significantly larger effects among children of cash transfer recipients within households is consistent with earlier results showing that the behavioral change promotion induces widespread changes in parenting practices. This is also in line with the effects on parenting practices and children's human capital not being driven by cash alone.<sup>55</sup>

Finally, we analyze heterogeneity by access to health services, specifically whether the nearest health center is more than 20 minutes away from the household (Panel D). We do not find significant heterogeneity by this proxy of access to services. However, we do not have data to test whether the BCC intervention varies by the quality of health services, which is known to be problematic in Niger and may be more relevant than access alone (World Bank, 2017b).<sup>56</sup>

## **7. Local BCC spillovers**

Results from specifications (1) and (2) show broad changes in parenting practices that are not driven by cash alone. To further analyze the mechanisms of impacts for the BCC intervention, we analyze its local spillover effects on non-beneficiary households. The estimates are based on the specification in equation (3), which is precisely identified using the sub-sample of actual non-beneficiaries from the cash transfer program in treatment villages.<sup>57</sup>

Table 9 documents local spillovers on intermediary outcomes, capturing parenting practices in four main domains: nutrition, health, stimulation and child protection.<sup>58</sup> Results are highly consistent with the direct impacts in Table 3. They show that the behavioral change component triggers broad changes in parenting behaviors among cash transfer non-beneficiary households, too. Local spillovers are found on a range of parenting practices. In the nutrition domain, nutrition practices for children aged 12-23 months and dietary diversity for children aged 6-59 months improve. In the health domain, there is no significant impact on preventive health practices and reported illnesses, though there are spillovers on utilization of

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<sup>55</sup> First wives differ from other wives in ways other than just receiving the cash transfers. For instance, they tend to be older and have more children. In the context of rural Niger, data suggest little inequalities between children of different wives within households, although first wives hold more assets than more junior wives. We also analyzed whether impacts on human capital differ among children of younger mothers (not shown). Younger mothers, who have had fewer children, may be more likely to change behavior and adopt changes in parenting practices conducive to early childhood development. We do not find robust patterns of heterogeneity. This is also consistent with the widespread effects on parenting practices observed earlier.

<sup>56</sup> We further tested heterogeneity of BCC impacts by exposure to report drought shocks and did not find significant heterogeneity along that dimension either.

<sup>57</sup> Recall that we measure local spillovers on non-beneficiaries that passed the program exclusion criteria, and we do not have data on the 14% of households in the village that did not (see discussion in Section 3.2).

<sup>58</sup> Results from the index components are presented in Tables A20-A22.

health services conditional on being sick. In the stimulation domain, the stimulation and stimulation material indices improve. No spillovers are observed on the disciplining index or the share of children with a birth certificate. Overall, the improvements in parenting practices among non-beneficiaries are consistent with those observed among beneficiaries in Table 3. These significant local spillover effects show that the behavioral change component leads to changes in a range of parenting practices in villages where it is implemented, which are suggestive of more general changes in norms on parenting practices in communities exposed to the behavioral change component.

Table 10 presents estimates of the spillover effects of the BCC intervention on anthropometrics and child development. Spillover patterns of the BCC component on children's human capital are consistent with observed impacts on beneficiaries in Table 4. Improvements in socio-emotional development are also found among non-beneficiaries and are again of moderate magnitude (0.15 standard deviations). There is no robust improvement in anthropometric outcomes. No statistically significant impact is observed on cognitive development either.<sup>59</sup>

The findings on local spillovers are consistent with the main results. First, they show that behavioral changes are observed without cash transfers, in line with the BCC component affecting behaviors and possibly norms. Second, they also show that changes in parenting practices are insufficient to improve human capital outcomes, even among (slightly) less poor households in the study setting.

It is noteworthy that the BCC spillovers on cash transfer non-beneficiaries (in Table 9) are in several dimensions of similar magnitude as the direct effects on cash transfer beneficiaries (in Table A6). Recall that the program included village assemblies, small group meetings and household visits. The assemblies were rather large events taking place in a central location in the village. Allowing the broader community to participate (including non-beneficiaries, but also men and village leaders) was considered important to ensure broader normative support for the BCC messages. While we do not have administrative data to quantify non-beneficiaries' participation in BCC activities, we collected self-reported data on participation in community meetings and household visits during the follow-up survey. These data are less reliable than the administrative attendance data, and likely to underreport attendance. Still, they provide information on the relative participation of beneficiaries and non-

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<sup>59</sup>Table A23 presents results for alternative approaches to handle outliers in anthropometric measures. Estimates for height for age z scores tend to be negative and are marginally statistically significant when trimming the distribution at the 5<sup>th</sup> and 95<sup>th</sup> percentile. Tables A24-A26 show no statistically significant BCC spillover effect on consumption, assets, savings or other household members' human capital outcomes. The negative coefficients for mother's brachial perimeter in Table A24 also become marginally statistically significant when trimming the distribution at the 5<sup>th</sup> and 95<sup>th</sup> percentile.

beneficiaries. Table A27 shows that the BCC intervention increases self-reported participation in community meetings among beneficiaries as well as non-beneficiaries.<sup>60</sup> The results suggest that non-beneficiaries participated in about half the village meetings ( $1.73/3.76=46\%$ ), and about a quarter of household visits ( $0.56/2.26=24.8\%$ ) compared to cash transfer beneficiaries. These patterns are consistent with information from qualitative work, which highlighted strong participation from non-beneficiaries in village assemblies,<sup>61</sup> and also found that neighbors voluntarily joined some of the household visits despite not being explicitly targeted.

Overall, while the results are indicative of broad changes in behaviors and likely norms, we cannot disentangle the effects from non-beneficiaries participating in some of these activities from pure spillovers arising from organic information-sharing between beneficiaries and non-beneficiaries in villages assigned to BCC. Similarly, beneficiaries' participation rates were high across all activities, so that we do not have variation to isolate the relative effect of the village assemblies compared to the small-group meetings or household visits. In future research, it would be interesting to unpack the behavioral and social mechanisms behind the effects on non-beneficiaries, as well as the optimal dosage of group activities and household visits.

The results are consistent with shifts in behaviors and norms, and strong group dynamics were observed during qualitative fieldwork on the BCC intervention. In a subsequent phase of the Niger cash transfer program, additional interventions to improve livelihoods were tested and were also found to be particularly effective when addressing social norms and boosting social dynamics (Bossuroy et al., 2022).

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<sup>60</sup> Among predicted beneficiaries, the BCC intervention increases the number of village meetings attended by 3.08, and household visits by 1.66. (Cash transfers alone increase the number of village meetings by 0.85 and do not have a significant effect on the number of household visits). Among cash transfer beneficiaries, the BCC intervention increases the number of village meetings attended by 3.76 and the number of household visits by 2.26. Among cash transfer non-beneficiaries, the BCC intervention increases the number of meetings attended by 1.73, and the number of household visits by 0.56.

<sup>61</sup> Qualitative work suggested that the BCC intervention was popular for a variety of reasons. The village assemblies used skits or theatre plays, which gave them a fun dimension. The facilitation of the activities was designed to leverage informal social dynamics. Village leaders often participated and help gather participants. The intervention built upon a sense of moral duty and collective responsibility. It leveraged trust facilitated by the regular cash transfer payments. The qualitative study also highlighted that parents appreciated that the BCC intervention provided information to help shape their children's future in a context of rapidly increasing educational achievement. For example, most parents in the sample had never been to school, but close to 60 percent of children attended school during the study period, a rapid change within a single generation.



## 8. Conclusion

In this paper, we analyze the relative effects of behavioral change promotion and cash transfers on parenting practices and young children's human capital in the low-income setting of rural Niger. Results show that behavioral change promotion induces robust changes in parenting practices related to nutrition, health, psycho-social stimulation and child protection. It also generates local spillovers on parenting practices among households not benefiting from cash transfers in treated villages. The results point to broad changes in parenting knowledge and practices that are not driven by cash alone.

The impacts of behavioral change promotion on children's human capital are limited, however. Moderate improvements in socio-emotional development are found, but children's anthropometric and cognitive development do not improve. Increases in psycho-social stimulation and reduction in harsh disciplining may contribute to improving socio-emotional development. Yet changes in psycho-social and nutrition practices are not sufficient to improve cognitive development or anthropometric outcomes.

While it remains possible that changes in final outcomes among children may take more time to materialize, the observed impacts are measured after 18 months of exposure to the behavioral parenting intervention, which is broadly in line with studies documenting short-term impacts of parenting interventions in other contexts (Attanasio et al., 2020; Macours et al., 2015; Carneiro et al., 2021).

Results also show that cash transfers alone do not lead to much improvement in young children's human capital in the study context: cash transfers alone do not improve parenting practices or children's outcomes. While cash transfers improve welfare and dietary diversity at the household level, they do not lead to higher dietary diversity among children. In contrast, the behavioral change intervention leads to improvements in dietary diversity for children but not at the household level. Cash transfers increase non-food consumption, including of private adult goods, which the BCC intervention offsets. Results suggest that the BCC intervention leads to some intra-household reallocation of resources from adults toward young children. The study thus documents that, while cash transfers improve household welfare, they are not sufficient to improve early childhood development in the low-income setting of Niger.

Though we cannot formally test for complementarities in absence of an experimental group receiving BCC without cash transfers, the study does not point to synergies between the impacts of the cash transfer and behavioral change interventions. Most effects on parenting practices and children's human capital stem from the behavioral change intervention. Still, the delivery of the behavioral change parenting

intervention was facilitated by its implementation through a national cash transfer program. The safety net system provided a delivery mechanism to implement the behavioral intervention at large scale in the poorest areas of the country. Delivery through the national safety net also likely contributed to high participation rates and facilitated strong mobilization and social dynamics around the program. As such, the integration of the parenting intervention in the safety nets had advantages from an implementation standpoint, and it is not clear if the take-up or effect of the BCC intervention delinked from the cash transfer program would have been the same.

Overall, the results likely reflect the widespread poverty and multiple deprivations of the study context. In environments where several risk factors interplay, demand-side interventions, even if they address a range of interlinked behaviors, may require other complementary investments to be effective. In light of the study results, the Niger safety net unit has attempted to strengthen its approach to identify and monitor cases of malnutrition, as well as to better coordinate the behavioral change component with supply-side interventions in the water and sanitation, health and education sectors. The study findings also suggest that stronger attention to mothers' nutrition may be needed, such as in another intervention that is more directly targeted to pregnant women and has stronger impacts on anthropometrics in neighboring Nigeria (Carneiro et al., 2021). Additional research would also be welcome to better understand potential complementarities between cash transfers, demand-side behavioral change promotion and supply-side interventions improving the quality of services or providing direct nutrition support to children or mothers.

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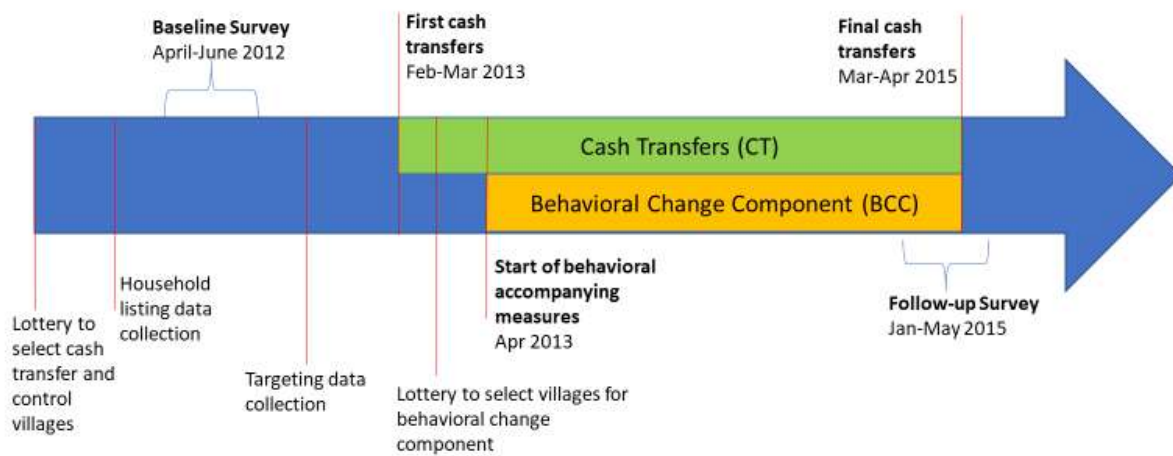
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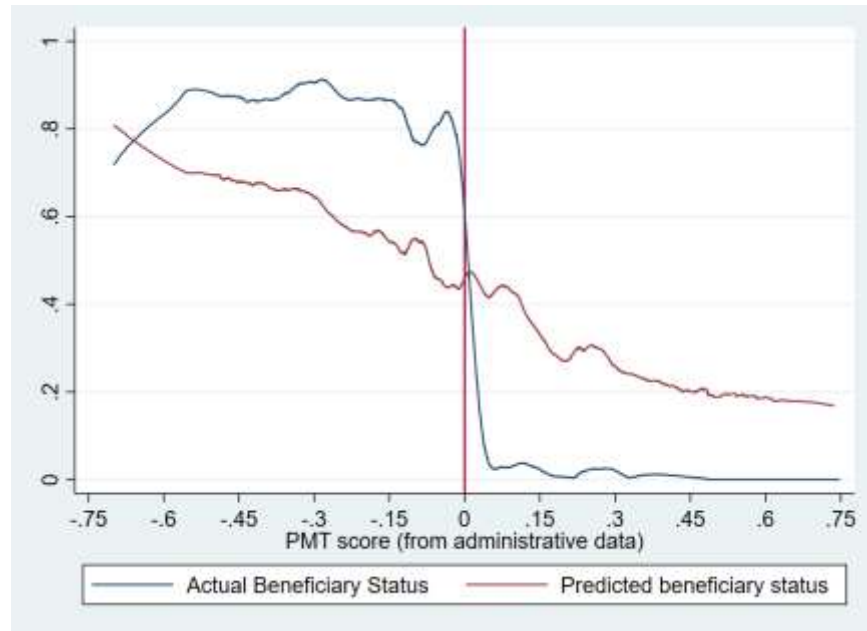
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**Figure 1: Timeline**





**Figure 2: Cash Transfer Program Beneficiary Status**  
**(based on PMT score from Targeting Data or Baseline Survey)**



Note: This figure shows how the probability that households in the treatment group are selected as beneficiaries of the cash transfer program depends on the PMT score calculated from the targeting data (blue line), or on a PMT score estimated from the RCT baseline survey (red line). The PMT score is centered so that the selection threshold is 0 (a household is selected as beneficiary if it has a PMT score below 0). 55% of predicted beneficiaries (based on the baseline PMT score) are actual beneficiaries.

**Table 1: Samples for Main Specifications**

<b>Predicted beneficiaries (from baseline sample)</b>	<b>Control</b>		<b>Cash</b>		<b>Cash + BCC</b>	
	<i>cell A</i> households children	560 866	<i>cell B</i> households children	567 919	558 855	<i>cell C</i> households children
						specification 1, 1685 households and 2640 children
<b>Actual beneficiaries (from baseline sample)</b>	<b>Control</b>		<b>Cash</b>		<b>Cash + BCC</b>	
			<i>cell D</i> households children	541 855	557 826	<i>cell E</i> households children
			<i>cell F</i> households children	497 769	510 815	<i>cell G</i> households children
<b>Actual beneficiaries (from booster sample)</b>						specification 2, 2105 households and 3265 children
<b>Actual non-beneficiaries (from baseline sample)</b>	<b>Control</b>		<b>Cash</b>		<b>Cash + BCC</b>	
	<i>cell H</i> households children	1,266 1,724	<i>cell I</i> households children	730 971	717 896	<i>cell G</i> households children
						specification 3, 1447 households and 1867 children

Notes: This table details samples used for the main specifications. It distinguishes between cash transfer beneficiaries (separately for households from the baseline sample and from a booster sample added at follow-up) and cash transfer non-beneficiaries across villages assigned to the control group, cash only group, or cash with BCC group. The top panel provides the break-down of the sample used to estimate the intent-to-treat impacts of cash transfers and BCC on the sub-sample of predicted beneficiary households based on their PMT scores estimated using the baseline survey (specification 1). The middle panel provides the break-down of the follow-up sample used to estimate the value-added of the BCC intervention as part of the robustness checks with specification 2. The bottom panel provides the break-down of the follow-up sample used to estimate local spillovers from the BCC intervention in specification 3. The follow-up sample includes 4818 households and 6856 children (cells D + E + F + G + H + I + G), of which 3811 households and 5272 children were interviewed at baseline (cells D + E + H + I + G). Among households surveyed at baseline and follow-up, the top panel displays the share of predicted beneficiary households (and children in beneficiary households) per treatment arm. 1685/3811=44.2% of baseline households interviewed at follow-up and 2640/5272=50% of children in baseline households interviewed at follow-up are predicted beneficiaries.

**Table 2: Baseline Balance (baseline households surveyed at follow-up)**

	Panel A: All households					Panel B: Predicted beneficiaries					Panel C: Beneficiaries		
	N	Mean in control	Cash-control Diff	(Cash+BCC) - control Diff	(Cash+BCC) - cash Diff	N	Mean in control	Cash-control Diff	(Cash+BCC) - control Diff	(Cash+BCC) - cash Diff	N	Mean in cash	(Cash+BCC) - cash Diff
<u>Variables from household survey</u>													
Household (hh) size	3,811	8.35	0.31	0.21	0.11	1,685	10.22	-0.02	-0.11	0.09	1,098	9.57	0.25
Hh head is polygamous	3,811	0.44	-0.02	-0.04	0.02	1,685	0.57	-0.01	-0.09**	0.08**	1,098	0.52	0.00
Hh head has never been to school	3,811	0.90	0.04***	0.02	0.02	1,685	0.93	0.03*	0	0.03	1,098	0.94	0.02
Hh head owns land	3,811	0.99	0.00	-0.01	0.01	1,685	0.99	0	0	-0.01	1,098	0.98	-0.01
Number of rooms in dwelling	3,804	3.08	0.00	-0.03	0.03	1,680	3.4	-0.12	-0.13	0.01	1,097	3.21	-0.04
Number of hh durable assets	3,811	4.60	0.07	-0.08	0.15	1,685	3.97	0.06	-0.12	0.19	1,098	4.63	0.07
Livestock index (TLU)	3,811	1.79	-0.03	0.21	-0.24	1,685	1.56	-0.25	-0.08	-0.17	1,098	1.78	-0.04
Hh member participated in a tontine (Rosca)	3,811	0.12	0.01	0.00	0.01	1,685	0.1	0.02	0	0.02	1,098	0.12	0.01
Time to nearest health center (min)	3,809	27.87	3.82	-0.74	4.56	1,683	27	4.53	2.11	2.42	1,098	31.87	6.45*
Time to fetch water (min)	3,648	26.45	3.25	1.74	1.51	1,611	26.96	4	1.8	2.2	1,055	29.76	-0.05
Hh has treated mostquito net	3,811	0.19	-0.02	-0.05*	0.03	1,685	0.17	-0.01	-0.02	0.01	1,098	0.17	0.03
Non-food consumption per capita (FCFA)	3,647	19,099	-258	-1,706	1,448	1,643	14,385	298	-976	1,273	1,059	17,013	786
Food consumption per capita (FCFA)	3,675	95,194	-4,675	-4,330	-345	1,663	79,507	-1,943	-2,730	787	1,066	83,472	-4,500
Total consumption per capita (FCFA)	3,656	116,253	-4,496	-5,462	967	1,651	94,652	-493	-2,788	2,295	1,061	103,920	-1,814
Share of food in total consumption	3,811	0.82	0.00	0.01	-0.01	1,685	0.84	-0.01	0.00	-0.01	1,098	0.82	-0.02
Dietary diversity (food consumption score)	3,748	50.39	-0.30	-2.28	1.98	1,656	48.52	-2.05	-3.22	1.16	1,084	48.93	0.57
Hh reported drought shock	3,811	0.71	0.01	-0.02	0.03	1,685	0.70	0.03	0.00	0.03	1,098	0.72	0.03
Hh reported crop disease	3,811	0.24	0.01	0.04	-0.03	1,685	0.25	0.01	-0.02	0.03	1,098	0.27	-0.01
Hh reported input price increase	3,811	0.20	-0.01	-0.01	0.00	1,685	0.19	0.00	-0.02	0.02	1,098	0.18	-0.01
Hh reported food price increase	3,811	0.56	0.00	0.02	-0.02	1,685	0.58	0.01	-0.01	0.02	1,098	0.56	-0.03
Number of live births for adult women	6,851	4.37	0.06	-0.18	0.24*	3,565	4.65	0.03	-0.27	0.30*	2,168	4.73	0.29
Adult woman pregnant in last 12 months	6,851	0.30	0.00	-0.02	0.02	3,565	0.31	-0.01	-0.04**	0.03	2,168	0.31	0.05**
Adult women not pregnant uses contraception	6,131	0.14	0.02	-0.02	0.04*	3,218	0.14	0.01	-0.03	0.04**	1,915	0.18	0.05*
Young child aged 0-4 reported sick in last month	4,190	0.36	-0.06**	-0.05**	-0.01	2,274	0.30	-0.02	-0.01	-0.01	1,372	0.29	-0.02
Child aged 5-14 reported sick in last month	14,879	0.14	-0.02*	-0.01	-0.01	8,370	0.12	-0.01	0.00	-0.01	4,937	0.11	-0.02
Adult 15+ reported sick in last month	13,387	0.18	-0.02	-0.01	-0.01	6,503	0.16	-0.02	0.00	-0.02	4,059	0.15	-0.01
Sick young child (0-4) consulted	1,328	0.82	-0.04	-0.03	0.00	660	0.85	-0.06	-0.04	-0.02	410	0.76	-0.04
Sick child (5-14) consulted	1,883	0.53	-0.04	0.06	-0.10***	983	0.49	0.02	0.11**	-0.09*	594	0.49	-0.04
Sick adult (15+) consulted	2,279	0.51	-0.03	0.00	-0.03	969	0.49	-0.02	0.06	-0.08*	630	0.48	-0.02
Child (6-14) attended school	12,052	0.46	-0.04	-0.04	-0.01	6,767	0.44	-0.05	-0.03	-0.02	4,010	0.40	-0.02
<u>Variables from child survey</u>													
Height for age z score	5,515	-1.94	-0.01	-0.11	0.10	2,964	-1.97	-0.07	-0.11	0.04	1,800	-2.01	0.07
Weight for height z score	5,510	-1.32	0.01	0.07	-0.06	2,962	-1.32	-0.06	0.07	-0.13*	1,800	-1.31	-0.08
Weigh for age z score	5,526	-2.38	0.02	-0.02	0.04	2,963	-2.39	-0.06	-0.02	-0.04	1,811	-2.42	-0.01
Dietary diversity (food consumption score)	5,450	43.90	1.25	2.08	-0.82	2,939	42.18	2.45	2.89	-0.45	1,800	44.22	0.13
Number of food types consumed in last week	5,455	5.83	-0.10	0.08	-0.18	2,941	5.58	0.17	0.22	-0.06	1,800	5.63	-0.18
Received vitamin A	5,637	0.85	0.05	-0.05	0.10**	3,039	0.84	0.07	-0.05	0.12**	1,855	0.91	0.11**
Received deworming	5,558	0.35	0.08*	0.08*	0.00	2,997	0.33	0.08*	0.08*	0.00	1,829	0.45	0.02
Received all vaccines	5,490	0.40	0.02	0.01	0.01	2,964	0.36	0.04	0.03	0.01	1,811	0.40	-0.02
Cognitive score (children 6-42 months, norm=10)	3,717	6.24	0.20	0.44*	-0.25	1,978	6.17	0.19	0.53**	-0.34	1,222	6.37	-0.34
Stimulation material index (scale: 0-6)	5,655	3.16	0.02	-0.26	0.28	3,049	3.16	-0.08	-0.27	0.19	1,855	3.11	0.18
Stimulation index (scale: 0-7)	5,638	2.06	0.01	0.28	-0.27	3,042	2.01	0.12	0.40*	-0.28	1,845	2.04	-0.33
Has birth certificate	5,680	0.48	-0.03	0.04	-0.08*	3,657	0.44	-0.02	0.03	-0.06	1,864	0.43	-0.07

Note: This table documents balance for baseline households surveyed at follow-up. Panel A considers all baseline households surveyed at follow-up. Panel B considers households predicted to be beneficiaries when applying the PMT targeting formula to the baseline survey in treatment and control groups. Panel C considers actual beneficiaries only. Balance is documented for variables from the household survey (top panel, first for household-level variables, then for individual-level variables), as well as children's outcomes (bottom panel). The exchange rate was 1 USD = 497 CFA francs (FCFA) on January 1, 2013, and 1 USD = 541 CFA francs (FCFA) on January 1, 2015. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

**Table 3: Parenting practices (ITT for predicted beneficiaries)**

	Nutrition		Health		Stimulation		Child protection		
	Nutrition Practice Index (12-23 months old)	Dietary Diversity	Preventive Health Practice Index	Sick	Consulted if sick	Stimulation Index	Stimulation material index	Discipline Index	Has birth certificate
BCC (Value-Added)	0.287* (0.150)	0.240** (0.097)	0.238** (0.096)	-0.007 (0.040)	0.083* (0.045)	0.361*** (0.117)	0.210** (0.086)	0.211*** (0.076)	0.021 (0.031)
Cash	0.117 (0.128)	0.015 (0.102)	0.029 (0.082)	0.070* (0.040)	0.035 (0.045)	-0.096 (0.111)	0.012 (0.081)	-0.015 (0.080)	-0.034 (0.030)
p for BCC + Cash = 0	0.00	0.00	0.00	0.13	0.02	0.02	0.01	0.01	0.63
p for BCC - Cash = 0	0.48	0.22	0.19	0.27	0.53	0.02	0.17	0.09	0.32
Exact p-value BCC	0.06	0.02	0.01	0.86	0.07	0.00	0.02	0.01	0.55
Exact p-value Cash	0.39	0.89	0.74	0.07	0.46	0.40	0.90	0.85	0.26
Randomization t joint test	0.02	0.01	0.01	0.17	0.05	0.01	0.02	0.01	0.55
Exact p-value BCC + Cash = 0	0.01	0.00	0.00	0.13	0.02	0.02	0.01	0.02	0.62
Exact p-value BCC - Cash = 0	0.49	0.22	0.19	0.29	0.55	0.02	0.17	0.10	0.35
Number of observations	541	2,640	2,568	2,616	963	2,638	2,639	2,639	2,605
R2	0.084	0.045	0.068	0.041	0.052	0.053	0.021	0.017	0.043
Mean in control (predicted beneficiaries)	-0.057	-0.065	-0.086	0.318	0.623	0.034	-0.027	0.047	0.881

Notes: See Table A2 for components of the nutrition practice index and the preventive health practice index, Table A3 for components of the stimulation index and stimulation material index, and Table A4 for components of the discipline index. Indices are standardized with respect to the full control group. The food consumption score is used to measure dietary diversity for children. The table presents ITT estimates for the impact of cash transfers and the behavioral change component on predicted beneficiary households (based on the specification in equation (1)). OLS estimates based on regressions including strata fixed effects and sampling weights. Robust (White-Huber) standard-errors are clustered by village clusters. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1 (based on asymptotic p-values). Exact randomization-t p-values, obtained from 2000 simulations, accounting for stratified randomization (Young, 2018).

**Table 4: Early childhood nutrition and development outcomes (ITT for predicted beneficiaries)**

	Anthropometrics			Child Development	
	Height for age	Weight for height	Weight for age	Cognitive Score	Socio-Emotional Score
BCC (Value-Added)	0.007 (0.064)	0.003 (0.059)	-0.019 (0.063)	0.023 (0.079)	0.132* (0.076)
Cash	-0.117 (0.074)	0.057 (0.055)	-0.053 (0.070)	-0.047 (0.067)	-0.054 (0.069)
p for BCC + Cash = 0	0.07	0.28	0.26	0.73	0.33
p for BCC - Cash = 0	0.32	0.59	0.77	0.59	0.13
Exact p-value BCC	0.91	0.96	0.76	0.79	0.09
Exact p-value Cash	0.11	0.32	0.47	0.49	0.47
Randomization t joint test	0.17	0.47	0.54	0.80	0.26
Exact p-value BCC + Cash = 0	0.09	0.29	0.27	0.74	0.33
Exact p-value BCC - Cash = 0	0.34	0.60	0.77	0.59	0.14
Number of observations	2,460	2,371	2,393	1,602	1,693
R2	0.039	0.017	0.031	0.014	0.024
Mean in control (predicted beneficiaries)	-0.027	-0.046	-0.059	-0.025	-0.012

Notes: Height-for-age (used to identify stunting), weight-for-height (used to identify wasting) and weight-for-age (used to identify underweight) are z scores for children aged 6-59 at the time of the follow-up survey. Cognitive (Bayley™) score is a z score for children aged 6-42 months at the time of the follow-up survey. Socio-emotional development (strength-and-difficulties) score is a z score for children aged 24-59 months at the time of the follow-up survey. All z scores are standardized with respect to the full control group. The table presents ITT estimates for the impact of cash transfers and the behavioral change component on predicted beneficiary households (based on the specification in equation (1)). OLS estimates based on regressions including strata fixed effects and sampling weights. Robust (White-Huber) standard-errors are clustered by village clusters. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1 (based on asymptotic p-values). Exact randomization-t p-values, obtained from 2000 simulations, accounting for stratified randomization (Young, 2018).

**Table 5: Food Security and Household Consumption (ITT for predicted beneficiaries)**

	Dietary Diversity (Food consumption score)	Household Dietary Diversity Score	Mother brachial perimeter	Total consumption pc	Food consumption pc	Non food consumption pc	Education and Health expenditures pc	Share of food consumption in total consumption	Adults (private) non-food consumption items	Children (private) non-food consumption items	Household reported higher food prices
BCC (Value-Added)	-2.055 (1.990)	-0.238 (0.220)	-1.123 (2.736)	-4,221.873 (5,812.357)	1,192.470 (3,580.568)	-3,922.330* (2,147.175)	-1,492.013 (1,583.694)	0.034** (0.014)	-470.349* (258.100)	-145.036 (126.806)	-0.027 (0.046)
Cash	4.565** (2.276)	0.615** (0.245)	-0.004 (3.290)	12,198.867** (6,127.619)	2,112.399 (3,845.842)	5,414.753** (2,144.677)	4,671.715*** (1,469.580)	-0.056*** (0.014)	579.558** (281.025)	225.839 (137.621)	0.051 (0.050)
p for BCC + Cash = 0	0.26	0.15	0.60	0.13	0.34	0.40	0.04	0.12	0.59	0.52	0.63
p for BCC - Cash = 0	0.07	0.03	0.84	0.13	0.89	0.02	0.02	0.00	0.04	0.11	0.34
Exact p-value BCC	0.32	0.29	0.71	0.48	0.72	0.08	0.35	0.02	0.06	0.26	0.55
Exact p-value Cash	0.06	0.02	1.00	0.05	0.62	0.01	0.00	0.00	0.04	0.11	0.31
Randomization t joint test	0.17	0.05	0.84	0.15	0.66	0.06	0.01	0.00	0.12	0.28	0.61
Exact p-value BCC + Cash = 0	0.26	0.16	0.62	0.14	0.36	0.42	0.05	0.15	0.64	0.53	0.65
Exact p-value BCC - Cash = 0	0.08	0.03	0.85	0.14	0.88	0.03	0.02	0.00	0.04	0.12	0.35
Number of observations	1,533	1,548	1,613	1,510	1,510	1,510	1,510	1,510	1,515	1,527	1,548
R2	0.047	0.070	0.046	0.140	0.122	0.089	0.051	0.071	0.089	0.036	0.014
Mean in control (predicted beneficiaries)	42.995	4.120	257.821	103,785.0	69,692.3	22,630.7	11,462.0	0.687	1,738.4	1,115.9	0.261

Notes: The food consumption score is used to measure dietary diversity. Consumption and expenditure variables in local currency (FCFA). The exchange rate was 1 USD = 497 CFA francs (FCFA) on January 1, 2013, and 1 USD = 541 CFA francs (FCFA) on January 1, 2015. The table presents ITT estimates for the impact of cash transfers and the behavioral change component on predicted beneficiary households (based on the specification in equation (1)). OLS estimates based on regressions including strata fixed effects and sampling weights. Robust (White-Huber) standard-errors are clustered by village clusters. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1 (based on asymptotic p-values). Exact randomization-t p-values, obtained from 2000 simulations, accounting for stratified randomization (Young, 2018).

**Table 6: Assets and savings (ITT for predicted beneficiaries)**

	# Household Durable Goods	# Household productive assets	Livestock (TLU index)	Participated in savings group (tontines)	Weekly amount contributed in tontines
BCC (Value-Added)	-0.635*	-0.016	0.065	0.021	-358.9
	(0.380)	(0.346)	(0.116)	(0.042)	(236.4)
Cash	0.381	-0.003	-0.110	0.075*	185.0
	(0.412)	(0.318)	(0.125)	(0.042)	(184.3)
p for BCC + Cash = 0	0.55	0.95	0.68	0.03	0.23
p for BCC - Cash = 0	0.13	0.98	0.42	0.44	0.17
Exact p-value BCC	0.10	0.97	0.58	0.63	0.14
Exact p-value Cash	0.40	0.99	0.39	0.07	0.35
Randomization t joint test	0.27	1.00	0.68	0.07	0.35
Exact p-value BCC + Cash = 0	0.57	0.96	0.68	0.02	0.24
Exact p-value BCC - Cash = 0	0.14	0.98	0.42	0.45	0.21
Number of observations	1,538	1,534	1,531	1,548	1,548
R2	0.036	0.021	0.106	0.034	0.022
Mean in control (predicted beneficiaries)	4.753	6.589	1.527	0.207	598.8

Notes: Weekly amount contributed to savings group in local currency (FCFA). Livestock index in Tropical Livestock Unit (TLU). The exchange rate was 1 USD = 497 CFA francs (FCFA) on January 1, 2013, and 1 USD = 541 CFA francs (FCFA) on January 1, 2015. The table presents ITT estimates for the impact of cash transfers and the behavioral change component on predicted beneficiary households (based on the specification in equation (1)). OLS estimates based on regressions including strata fixed effects and sampling weights. Robust (White-Huber) standard-errors are clustered by village clusters. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1 (based on asymptotic p-values). Exact randomization-t p-values, obtained from 2000 simulations, accounting for stratified randomization (Young, 2018).

**Table 7: Impact on human development outcomes of other household members (ITT for predicted beneficiaries)**

	School enrollment (children 6-14)	# of school days missed (children 6-14)	Sick (children 5-14)	Consulted if sick (children 5-14)	Sick (adults 15+)	Consulted if sick (adults 15+)	Pregnant over last 12 months (adult women)	Uses contraception (adult women)
BCC (Value-Added)	0.015 (0.038)	-0.056 (0.060)	-0.023 (0.028)	0.084** (0.042)	-0.008 (0.030)	0.005 (0.031)	-0.013 (0.024)	-0.015 (0.017)
Cash	-0.020 (0.037)	0.100* (0.058)	0.064** (0.026)	0.057 (0.052)	0.062* (0.032)	0.024 (0.032)	-0.010 (0.024)	0.041** (0.017)
p for BCC + Cash = 0	0.87	0.41	0.16	0.02	0.13	0.41	0.29	0.12
p for BCC - Cash = 0	0.59	0.14	0.06	0.71	0.16	0.72	0.94	0.06
Exact p-value BCC	0.69	0.35	0.40	0.05	0.78	0.90	0.58	0.37
Exact p-value Cash	0.59	0.08	0.02	0.28	0.05	0.45	0.70	0.02
Randomization t joint test	0.86	0.24	0.06	0.04	0.15	0.69	0.60	0.06
Exact p-value BCC + Cash = 0	0.88	0.44	0.15	0.02	0.13	0.42	0.31	0.12
Exact p-value BCC - Cash = 0	0.60	0.16	0.06	0.70	0.16	0.74	0.94	0.06
Number of observations	6,172	3,533	6,675	1,498	6,627	2,150	3,809	3,809
R2	0.039	0.078	0.027	0.037	0.021	0.023	0.007	0.022
Mean in control (predicted beneficiaries)	0.573	0.168	0.192	0.394	0.293	0.488	0.395	0.064

Notes: The table presents ITT estimates for the impact of cash transfers and the behavioral change component on predicted beneficiary households (based on the specification in equation (1)). OLS estimates based on regressions including strata fixed effects and sampling weights. Robust (White-Huber) standard-errors are clustered by village clusters. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1 (based on asymptotic p-values). Exact randomization-t p-values, obtained from 2000 simulations, accounting for stratified randomization (Young, 2018).



**Table 8: Heterogeneity in value-added of BCC on children's human capital**

<u>A. Heterogeneity by child's age</u> (54.7% aged 0-2 years old)	height for age	weight for height	weight for age	Cognitive Score	Socio- Emotional Score
BCC	-0.071 (0.063)	0.041 (0.061)	-0.050 (0.059)	-0.071 (0.061)	0.135** (0.066)
BCC * age 0-2	0.063 (0.091)	-0.063 (0.086)	0.003 (0.072)	0.018 (0.071)	0.118 (0.097)
aged 0-2	-0.012 (0.079)	-0.447*** (0.059)	-0.334*** (0.052)	0.648*** (0.055)	-0.100 (0.074)
p for BCC=0 when age 0-2	0.91	0.73	0.46	0.43	0.02
Exact p-value BCC	0.27	0.48	0.39	0.25	0.05
Exact p-value BCC* age 0-2	0.50	0.48	0.97	0.80	0.26
Randomization t joint test	0.55	0.74	0.63	0.47	0.06
Number of observations	3,013	2,918	2,975	2,048	2,032
R2	0.028	0.090	0.063	0.117	0.042
<u>B. Heterogeneity by child's gender</u> (51.5% male)	height for age	weight for height	weight for age	Cognitive Score	Socio- Emotional Score
BCC	-0.001 (0.068)	-0.096* (0.054)	-0.065 (0.064)	0.004 (0.067)	0.114 (0.087)
BCC * boy	-0.068 (0.093)	0.185** (0.078)	0.024 (0.079)	-0.102 (0.075)	0.110 (0.084)
Boy	-0.132* (0.074)	-0.169*** (0.059)	-0.113* (0.058)	0.047 (0.054)	-0.053 (0.050)
p for BCC=0 when boy	0.32	0.16	0.51	0.17	0.00
Exact p-value BCC	0.98	0.08	0.31	0.96	0.21
Exact p-value BCC* boy	0.50	0.02	0.77	0.17	0.21
Randomization t joint test	0.65	0.06	0.56	0.32	0.01
Number of observations	3,014	2,919	2,976	2,049	2,033
R2	0.037	0.019	0.033	0.007	0.042
<u>C. Heterogeneity by child's mother</u> (48.7% first wife of head)	height for age	weight for height	weight for age	Cognitive Score	Socio- Emotional Score
BCC	-0.077 (0.064)	-0.025 (0.056)	-0.105 (0.066)	-0.058 (0.072)	0.133 (0.086)
BCC * child of 1st wife	0.081 (0.092)	0.048 (0.062)	0.104 (0.079)	-0.014 (0.081)	0.110 (0.094)
Child of 1st wife	-0.117 (0.071)	0.065 (0.044)	-0.041 (0.055)	0.018 (0.058)	-0.024 (0.054)
p for BCC=0 when child of 1st wife	0.95	0.66	1.00	0.31	0.00
Exact p-value BCC	0.25	0.65	0.15	0.43	0.14
Exact p-value BCC* child of 1st wife	0.40	0.46	0.22	0.86	0.29
Randomization t joint test	0.50	0.75	0.32	0.58	0.02
Number of observations	2,899	2,806	2,862	1,990	1,922
R2	0.032	0.016	0.032	0.007	0.045
<u>D. Heterogeneity by distance to health center (45.5% far, &gt;20min away)</u>	height for age	weight for height	weight for age	Cognitive Score	Socio- Emotional Score
BCC	-0.084 (0.060)	-0.020 (0.060)	-0.103 (0.063)	-0.099 (0.077)	0.169* (0.089)
BCC * far from health center	0.112 (0.076)	0.043 (0.086)	0.123 (0.080)	0.126 (0.095)	0.030 (0.124)
Far from health center	-0.089 (0.059)	-0.058 (0.046)	-0.095* (0.054)	-0.082 (0.071)	0.080 (0.072)
p for BCC=0 when far health center	0.67	0.70	0.75	0.69	0.03
Exact p-value BCC	0.18	0.75	0.12	0.21	0.08
Exact p-value BCC* far health center	0.14	0.62	0.13	0.20	0.82
Randomization t joint test	0.28	0.89	0.25	0.40	0.03
Number of observations	3,014	2,919	2,976	2,049	2,033
R2	0.029	0.015	0.031	0.008	0.043

Notes: Height-for-age (used to identify stunting), weight-for-height (used to identify wasting) and weight-for-age (used to identify underweight) are z scores for children aged 6-59 at the time of the follow-up survey. Cognitive (Bayley™) score is a z score for children aged 6-42 months at the time of the follow-up survey. Socio-emotional development (strength-and-difficulties) score is a z score for children aged 24-59 months at the time of the follow-up survey. All z scores are standardized with respect to the full control group. OLS estimates for heterogeneous treatment effect based on regressions including strata fixed effects and sampling weights. Robust (White-Huber) standard-errors are clustered by village clusters. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1 (based on asymptotic p-values). Exact randomization-t p-values, obtained from 2000 simulations, accounting for stratified randomization (Young, 2018).

**Table 9: Parenting practices (Spillovers of BCC for cash transfer non-beneficiaries)**

	Nutrition		Health		Stimulation		Child protection		
	Nutrition Practice Index (12-23 months old)	Dietary Diversity	Preventive Health Practice Index	Sick	Consulted if sick	Stimulation Index	Stimulation material index	Discipline Index	Has birth certificate
BCC (Spill-overs)	0.290** (0.119)	0.250*** (0.085)	0.120 (0.087)	-0.014 (0.045)	0.108** (0.043)	0.368*** (0.118)	0.283*** (0.092)	0.053 (0.084)	-0.008 (0.027)
Exact p-value	0.02	0.01	0.20	0.77	0.02	0.01	0.00	0.53	0.78
Number of observations	403	1,869	1,809	1,855	778	1,867	1,868	1,868	1,846
R2	0.122	0.045	0.057	0.047	0.071	0.075	0.035	0.011	0.031
Mean in cash only group (non beneficiaries)	-0.144	-0.028	0.053	0.426	0.640	-0.108	-0.019	0.006	0.881

Notes: See Table A20 for components of the nutrition practice index and the preventive health practice index, Table A21 for components of the stimulation index and stimulation material index, and Table A22 for components of the discipline index. Indices are standardized with respect to the full control group. The food consumption score is used to measure dietary diversity for children. The table isolates the spillover of the behavioral change promotion on actual cash transfer non-beneficiaries (based on the specification in equation (3)). OLS estimates based on regressions including strata fixed effects and sampling weights. Robust (White-Huber) standard-errors are clustered by village clusters. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1 (based on asymptotic p-values). Exact randomization-t p-values, obtained from 2000 simulations, accounting for stratified randomization (Young, 2018).

**Table 10: Early childhood nutrition and development outcomes (Spillovers of BCC for cash transfer non-beneficiaries)**

	<u>Anthropometrics</u>			<u>Child Development</u>	
	Height for age	Weight for height	Weight for age	Cognitive Score	Socio-Emotional Score
BCC (Value-Added)	-0.055 (0.052)	0.048 (0.053)	-0.027 (0.063)	-0.004 (0.069)	0.149** (0.062)
Exact p-value	0.31	0.38	0.69	0.96	0.03
Number of observations	1,748	1,676	1,704	1,141	1,179
R2	0.019	0.028	0.024	0.011	0.064
Mean in cash only group (non beneficiaries)	-0.092	-0.095	-0.091	-0.086	-0.152

Notes: Height-for-age (used to identify stunting), weight-for-height (used to identify wasting) and weight-for-age (used to identify underweight) are z scores for children aged 6-59 at the time of the follow-up survey. Cognitive (Bayley™) score is a z score for children aged 6-42 months at the time of the follow-up survey. Socio-emotional development (strength-and-difficulties) score is a z score for children aged 24-59 months at the time of the follow-up survey. All z scores are standardized with respect to the full control group. The table isolates the spillover of the behavioral change promotion on actual cash transfer non-beneficiaries (based on the specification in equation (3)). OLS estimates based on regressions including strata fixed effects and sampling weights. Robust (White-Huber) standard-errors are clustered by village clusters. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1 (based on asymptotic p-values). Exact randomization-t p-values, obtained from 2000 simulations, accounting for stratified randomization (Young, 2018).

## **Online Supplementary Material**

### **Additional Details on The Behavioral Change Intervention**

The “behavioral change component” (BCC, or “*Volet Comportemental*”) provides information to parents and encourages behavioral changes in parenting practices to promote early childhood development.

The curriculum builds on UNICEF’s “essential family practices” package, which is widely used around the world. In Niger, the UNICEF package of “essential family practices” focuses on the health and nutrition domains by covering the following themes: (i) exclusive breastfeeding for the first six months of life, (ii) sleeping under treated mosquito nets, (iii) providing children with oral rehydration solution in case of diarrhea, (iv) handwashing with soap, (v) complementary feeding for children after six months, (vi) use of preventive health care services to protect children against diseases, (vii) health visits for children at first sign of illness, and (viii) family planning. As part of the Niger cash transfer program, the content of the curriculum was further adjusted to cover themes relate to psycho-social stimulation, in line with recommendations such as those in Lancet (2007, 2011). The new material covers (i) recognizing signs of malnutrition, (ii) language stimulation, (iii) stimulation through play, (iv) school readiness, (v) brain development, (vi) birth registration, (vii) child school enrollment and attendance, (viii) discipline, punishment and conflict management; and (ix) attachment and socio-emotional development. Some of the original modules on essential family practices were adjusted (for instance covering hygiene of the home environment together with handwashing) and at times combined (for instance by covering preventive health behaviors together). The final curriculum contains 14 modules (see list in Section 2 of the paper).

The intervention is standardized through a detailed technical guide. It includes the curriculum, as well as detailed scripts and key messages for each theme and each activity. It also provides detailed implementation modalities, supervision and quality control arrangements, as well as protocols to record participants’ attendance in the project monitoring and information system. The technical guide was developed through multiple rounds of piloting and iterative field testing, which led to multiple revisions before the guide was adopted and implemented in the context of the program. The objective was to ensure consistency during implementation at scale, as well as to facilitate quality control and monitoring.

The intervention is based on a positive deviance approach, seeking to identify local examples of good practices to trigger broader behavioral change in the community. Its pedagogy relies heavily on role play and theater pieces, as well as a range of visual aids tailored for illiterate populations.

The behavioral change promotion intervention is designed to last approximately 18 months, starting three months after the first cash transfer payment. As part of the accompanying measures, each beneficiary household participates in three activities per month: a village assembly delivered by an NGO operator, a small-group meeting delivered by a community educator, and a home visit delivered by the same community educator. The village assembly is organized for approximately 50 beneficiary households on average. Although non-beneficiary households in those villages are not explicitly targeted, they can also participate in the assemblies. The community educator delivers one small-group meeting (*"causerie"*) targeted to groups of 25 beneficiaries each month, and then a household visit targeted to each beneficiary household each month.

To alleviate concerns about the number of messages (Vazir et al., 2013), they are designed to be introduced progressively, covering successively nutrition, health, psycho-social stimulation and protection. One new message or theme is introduced each month and is emphasized through all program activities that month. The message is then repeated periodically in subsequent months. In addition to covering these messages, some assemblies and small-group meetings also include cooking and play demonstrations, although these are not systematically implemented.

The behavioral change accompanying measures are not designed to take place at the same time as the cash transfer payments. They are implemented separately, including through specialized NGOs that are distinct from the micro-finance agencies in charge of providing monthly payments to beneficiaries. The behavioral component has a clear implementation and delivery structure. NGOs are contracted by the government-led Safety Nets Unit to deliver the curriculum. An NGO field staff is selected to serve 10-15 villages, and there is one quality controller for every five NGO field staff. In addition to NGO operators, one community educator is selected for each 25 beneficiaries (on average 2 per village). Community educators are typically not beneficiaries of the cash transfers but receive an allowance of 10,000CFA (approximately USD 20) per month for their work. NGO field staff and community educators participate in a two-weeks training at the beginning of the program, as well as similar two-week refresher trainings after 6 and 12 months of implementation. In addition to delivering village assemblies, NGO field staffs are also responsible for coaching community educators. The government program team trains, closely

monitors and supervises NGO field staff. The contracting of NGOs is a way to extend the capacity of the government agency, which remains the entity that leads and supervises overall implementation.

The BCC intervention was rolled-out between April 2013 and March 2015. In practice, this was done in two phases. During a first 6-months phase between April and September 2013, NGO operators were trained, community educators selected and trained, introductory community assemblies were held, and the first three training modules on exclusive breastfeeding, complementary feeding, and recognizing signs of malnutrition were implemented. The second phase of training of NGO operators and community educators started in January 2014. The roll-out of remaining modules took place between March 2014 and March 2015. Project staff undertook some refresher training and follow-up activities between the two phases, but the intensity was lower. The implementing NGO remained the same for the two phases in Dosso but changed in Maradi. Community educators mostly remained the same, though some replacements took place. Some changes were necessary for family reasons (pregnancies, child birth or marriage in other villages) or due to performance problems (non-compliance with technical guidelines or insufficient skills). In total, 21 community educators of 308 were replaced at some point during implementation.

Even though it was not compulsory, participation in the behavioral accompanying measures was very high. The average attendance rate among cash transfer beneficiaries was 92%. Substantial participation of non-beneficiaries in assemblies held in beneficiary villages was also observed.

The implementation of the behavioral change component was closely monitored. Continuous quality control protocols were established. Quality control included full-time controllers hired by the implementing NGOs, dedicated heads of accompanying measures hired directly by the project in each region, as well as a project field worker in each commune. Two qualitative process evaluations were undertaken. They found that quality of implementation was satisfactory overall (for additional discussion, see Premand et al., 2016). In addition, participation in community assemblies, small-group meetings and household visits is monitored, and captured monthly for each beneficiary in an information system held by the implementing agency.

The behavioral accompanying measures were designed as a relatively low-cost intervention to ensure the feasibility of its implementation at scale. Their cost is estimated at \$100 per direct cash transfer beneficiary household, or approximately 20% of the cash transfer amounts. Total implementation costs are estimated at \$86 per direct cash transfer beneficiary household, and indirect oversight costs at \$14.

Costs include direct field implementation costs, as well as oversight of the behavioral accompanying measures. Oversight costs mostly come from regional project offices in charge of supervising the implementation of NGO activities. Staff costs comprise 50% of the costs: 23% for NGO field workers, 16% for community educators, and 11% for NGO staff. NGO field activities and supervision amount to 18% of total costs, followed by workshop and training and administration costs. Project management costs from the national project implementation unit are not included, since many staffs work across components and management costs are difficult to distribute across activities. The fixed costs of designing the training package are not included either, nor are the opportunity costs for beneficiaries to participate in the behavioral accompanying measures.<sup>62</sup>

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<sup>62</sup> Hourly earnings for women in the study area are hard to estimate since most are active in agricultural or non-agricultural self-employment. Moreover, the behavioral accompanying measure activities were scheduled in consultation with communities to minimize conflicts with other activities in the village. High participation rate is consistent with a low opportunity cost. To obtain an upper bound for the opportunity costs of participation in the behavioral accompanying measures, we can use the cash-for-works program implemented by the safety nets unit as a benchmark. The cash-for-works provides a wage of 1,300 FCFA per day, or approximately 2.6 USD. In any given month, the behavioral accompanying measures include one village assembly (approximately 2 hours), one small group meeting (approximately 2 hours) and a household visit (approximately 1 hour), which could together be considered equivalent to one workday. Behavioral accompanying measures activities in the field span 15 months. We could then estimate that opportunity costs of participation amount at most to  $15 * 1,300$  FCFA per beneficiary, or 19,500 FCFA (or 39 USD) per person, or approximately 40% of direct and indirect costs. Again, this estimate constitutes an upper bound, as few women have access to occupations that provide earnings as high as the cash-for-works program. In practice, opportunity costs are likely substantially lower.

## Supplementary Tables

**Table A1: Differences in Baseline Characteristics between Beneficiary and Non-Beneficiary Households in Treatment Villages**  
(sample of baseline households surveyed at follow-up)

	N	Mean beneficiaries	N beneficiaries	Mean non-beneficiaries	N non-beneficiaries	Diff
<u>Variables from household survey</u>						
Household (hh) size	2,545	9.44	1,098	7.97	1,447	1.47***
Hh head is polygamous	2,545	0.52	1,098	0.34	1,447	0.18***
Hh head has never been to school	2,545	0.93	1,098	0.93	1,447	0.01
Hh head owns land	2,545	0.99	1,098	0.99	1,447	0.00
Number of rooms in dwelling	2,539	3.23	1,097	2.95	1,442	0.28***
Number of hh durable assets	2,545	4.59	1,098	4.59	1,447	0.00
Livestock index (TLU)	2,545	1.80	1,098	1.95	1,447	-0.15
Hh member participated in a tontine (Rosca)	2,545	0.12	1,098	0.12	1,447	0.00
Time to nearest health center (min)	2,544	28.60	1,098	30.03	1,446	-1.43
Time to fetch water (min)	2,433	29.79	1,055	28.29	1,378	1.50
Hh has treated mostquito net	2,545	0.16	1,098	0.16	1,447	0.00
Non-food consumption per capita (FCFA)	2,446	16,611	1,059	19,260	1,387	-2,649***
Food consumption per capita (FCFA)	2,459	85,759	1,066	94,467	1,393	-8,707***
Total consumption per capita (FCFA)	2,453	104,843	1,061	116,172	1,392	-11,329***
Share of food in total consumption	2,545	0.83	1,098	0.82	1,447	0.00
Dietary diversity (food consumption score)	2,502	48.64	1,084	49.45	1,418	-0.81
Hh reported drought shock	2,545	0.71	1,098	0.69	1,447	0.01
Hh reported crop disease	2,545	0.27	1,098	0.25	1,447	0.03
Hh reported input price increase	2,545	0.18	1,098	0.19	1,447	-0.01
Hh reported food price increase	2,545	0.57	1,098	0.57	1,447	0.01
Number of live births for adult women	4,634	4.59	2,168	4.07	2,466	0.51***
Adult woman pregnant in last 12 months	4,634	0.29	2,168	0.29	2,466	0.00
Adult women not pregnant uses contraception	4,136	0.15	1,915	0.13	2,221	0.02
Young child aged 0-4 reported sick in last month	2,854	0.30	1,372	0.30	1,482	0.00
Child aged 5-14 reported sick in last month	10,031	0.12	4,937	0.12	5,094	0.00
Adult 15+ reported sick in last month	9,007	0.16	4,059	0.17	4,948	-0.02**
Sick young child (0-4) consulted	852	0.78	410	0.79	442	-0.01
Sick child (5-14) consulted	1,215	0.51	594	0.56	621	-0.05
Sick adult (15+) consulted	1,488	0.49	630	0.51	858	-0.02
Child (6-14) attended school	8,110	0.41	4,010	0.43	4,100	-0.02
<u>Variables from child survey</u>						
Height for age z score	1,059	-1.927	495	-1.836	564	-0.09
Weight for height z score	1,056	-1.565	495	-1.520	561	-0.04
Weigh for age z score	1,031	-2.753	483	-2.617	548	-0.14*
Dietary diversity (food consumption score)	977	42.41	456	45.76	521	-3.35**
Number of food types consumed in last week	980	5.418	457	5.788	523	-0.37**
Received vitamin A	1,077	0.847	504	0.841	573	0.01
Received deworming	1,061	0.300	497	0.287	564	0.01
Received all vaccines	1,065	0.359	498	0.354	567	0.00
Cognitive score (children 6-42 months, norm=10)	1,003	6.816	472	6.962	531	-0.15
Stimulation material index (scale: 0-6)	1,077	2.395	504	2.504	573	-0.11
Stimulation index (scale: 0-7)	1,071	1.435	499	1.512	572	-0.08
Has birth certificate	1,082	0.645	507	0.668	575	-0.02

Note: This table documents differences between beneficiary and non-beneficiary households at baseline in villages assigned to treatment. The sample includes all baseline households surveyed at follow-up in treatment villages. The exchange rate was 1 USD = 497 CFA francs (FCFA) on January 1, 2013, and 1 USD = 541 CFA francs (FCFA) on January 1, 2015. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.



Table A2: Components of nutrition and health indices (ITT for predicted beneficiaries)

	Nutrition Practice Index (for children 12-23 months old)										Preventive Health Practice Index					
	Exclusively breastfed for 6 months (sub-index)	Number of complementary food types (sub-index)	Vitamin	Juice	Rehydration solution	Prepared food	Milk	Liquid	Solid food	Cereals	Completed vaccines	Received vitamin A	Received iron	Received deworming	Caregiver washes hand with soap	Sleep under treated mosquito net
BCC (Value-Added)	0.125 (0.115)	0.267* (0.160)	-0.025 (0.046)	0.045 (0.051)	0.034* (0.020)	0.077 (0.068)	0.099 (0.065)	-0.008 (0.013)	-0.014 (0.018)	0.058* (0.032)	0.015 (0.034)	0.049** (0.021)	0.105** (0.042)	0.029 (0.038)	0.079** (0.039)	0.008 (0.044)
Cash	0.072 (0.118)	0.088 (0.133)	0.082* (0.044)	0.038 (0.049)	-0.008 (0.014)	0.009 (0.062)	0.018 (0.075)	-0.005 (0.006)	-0.011 (0.015)	-0.036 (0.036)	-0.004 (0.034)	-0.004 (0.021)	0.005 (0.035)	0.016 (0.038)	-0.009 (0.038)	0.031 (0.037)
p for BCC + Cash = 0	0.10	0.01	0.18	0.10	0.19	0.21	0.10	0.34	0.13	0.60	0.76	0.02	0.01	0.19	0.06	0.33
p for BCC - Cash = 0	0.79	0.49	0.18	0.93	0.13	0.53	0.51	0.87	0.91	0.08	0.73	0.17	0.12	0.84	0.20	0.74
Exact p-value BCC	0.27	0.11	0.59	0.40	0.10	0.26	0.14	0.81	0.50	0.07	0.67	0.03	0.01	0.44	0.05	0.84
Exact p-value Cash	0.54	0.51	0.07	0.45	0.58	0.90	0.81	0.56	0.50	0.32	0.90	0.87	0.89	0.69	0.82	0.39
Randomization t joint test	0.27	0.04	0.17	0.28	0.28	0.43	0.18	0.72	0.38	0.18	0.90	0.03	0.02	0.43	0.09	0.54
Exact p-value BCC + Cash = 0	0.11	0.01	0.18	0.11	0.21	0.24	0.11	0.51	0.16	0.62	0.76	0.02	0.01	0.20	0.07	0.35
Exact p-value BCC - Cash = 0	0.79	0.50	0.18	0.92	0.14	0.53	0.52	0.96	0.91	0.10	0.73	0.16	0.11	0.85	0.21	0.73
Number of observations	541	541	541	541	541	541	541	541	541	541	2,568	2,568	2,568	2,568	2,568	2,568
R2	0.188	0.047	0.053	0.050	0.027	0.053	0.056	0.045	0.021	0.056	0.044	0.040	0.074	0.055	0.050	0.058
Mean in control (predicted beneficiaries)	0.021	-0.101	0.116	0.105	0.023	0.134	0.471	0.994	0.977	0.058	0.570	0.889	0.142	0.638	0.780	0.129

Notes: Components of nutrition practice index and preventive health practice index in Table 3. Sub-indices are standardized with respect to the full control group. The table presents ITT estimates for the impact of cash transfers and the behavioral change component on predicted beneficiary households (based on the specification in equation (1)). OLS estimates based on regressions including strata fixed effects and sampling weights. Robust (White-Huber) standard-errors are clustered by village clusters. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1 (based on asymptotic p-values). Exact randomization-t p-values, obtained from 2000 simulations, accounting for stratified randomization (Young, 2018).

**Table A3: Components of stimulation indices (ITT for predicted beneficiaries)**

	Stimulation index					Stimulation material index							
	Read	Tell stories	Take walks together	Play	Name	Count	Draw	Play with homemade toy	Play with manufactured toys	Play with household object	Play with animals	Play with toy that can be pulled	Play with balls
BCC (Value-Added)	0.024*	0.160***	0.120**	0.097**	0.058	0.111***	0.062**	0.014	0.086***	0.039	0.025	0.046	0.076**
	(0.013)	(0.050)	(0.058)	(0.039)	(0.042)	(0.035)	(0.030)	(0.044)	(0.030)	(0.028)	(0.021)	(0.044)	(0.035)
Cash	0.011	-0.057	-0.058	-0.070*	0.019	-0.015	0.002	-0.009	0.056**	-0.039	-0.035	0.038	0.005
	(0.010)	(0.056)	(0.060)	(0.037)	(0.040)	(0.032)	(0.027)	(0.049)	(0.025)	(0.026)	(0.022)	(0.045)	(0.035)
p for BCC + Cash = 0	0.01	0.01	0.26	0.44	0.07	0.01	0.04	0.91	0.00	0.99	0.67	0.06	0.02
p for BCC - Cash = 0	0.53	0.03	0.09	0.01	0.58	0.02	0.22	0.79	0.54	0.12	0.10	0.92	0.24
Exact p-value BCC	0.09	0.00	0.05	0.01	0.19	0.00	0.05	0.77	0.01	0.18	0.25	0.31	0.04
Exact p-value Cash	0.29	0.31	0.33	0.07	0.66	0.65	0.94	0.86	0.03	0.17	0.12	0.41	0.91
Randomization t joint test	0.04	0.00	0.13	0.04	0.21	0.01	0.09	0.96	0.00	0.34	0.28	0.18	0.05
Exact p-value BCC + Cash = 0	0.01	0.01	0.28	0.45	0.08	0.01	0.04	0.90	0.00	0.99	0.67	0.07	0.03
Exact p-value BCC - Cash = 0	0.56	0.03	0.09	0.02	0.58	0.03	0.22	0.79	0.55	0.12	0.11	0.92	0.24
Number of observations	2,638	2,638	2,638	2,638	2,638	2,638	2,638	2,639	2,639	2,639	2,639	2,639	2,639
R2	0.032	0.027	0.046	0.019	0.027	0.051	0.024	0.023	0.049	0.028	0.015	0.023	0.026
Mean in control (predicted beneficiaries)	0.024	0.399	0.704	0.757	0.355	0.267	0.108	0.615	0.111	0.905	0.860	0.444	0.272

Notes: Components of stimulation and stimulation material indices in Table 3. The table presents ITT estimates for the impact of cash transfers and the behavioral change component on predicted beneficiary households (based on the specification in equation (1)). OLS estimates based on regressions including strata fixed effects and sampling weights. Robust (White-Huber) standard-errors are clustered by village clusters. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1 (based on asymptotic p-values). Exact randomization-t p-values, obtained from 2000 simulations, accounting for stratified randomization (Young, 2018).

**Table A4: Components of discipline index (ITT for predicted beneficiaries)**

	Positive discipline sub-index	Discipline by explaining	Discipline by re-directing	Negative discipline sub-index	Forbid	Shake	Yell	Spank	Spank with an object	Berate	Slap	Hit on hands	Hit with an object
BCC (Value-Added)	0.003 (0.060)	-0.018 (0.030)	0.020 (0.032)	-0.191** (0.076)	-0.004 (0.029)	-0.030 (0.037)	-0.052 (0.036)	-0.068* (0.039)	-0.052 (0.035)	-0.123*** (0.031)	-0.079*** (0.025)	-0.047 (0.030)	-0.002 (0.014)
Cash	0.006 (0.059)	-0.016 (0.029)	0.020 (0.030)	0.015 (0.075)	-0.036 (0.032)	-0.037 (0.029)	-0.029 (0.029)	0.025 (0.042)	0.066 (0.040)	0.046 (0.029)	0.002 (0.031)	0.008 (0.033)	-0.008 (0.014)
p for BCC + Cash = 0	0.89	0.27	0.24	0.02	0.22	0.07	0.02	0.29	0.66	0.01	0.01	0.22	0.44
p for BCC - Cash = 0	0.98	0.97	1.00	0.11	0.52	0.90	0.66	0.19	0.09	0.00	0.10	0.32	0.81
Exact p-value BCC	0.97	0.55	0.55	0.02	0.89	0.45	0.16	0.09	0.16	0.00	0.00	0.14	0.87
Exact p-value Cash	0.92	0.59	0.54	0.84	0.27	0.22	0.32	0.54	0.10	0.11	0.94	0.82	0.57
Randomization t joint test	0.99	0.55	0.53	0.03	0.43	0.18	0.10	0.23	0.25	0.00	0.00	0.28	0.74
Exact p-value BCC + Cash = 0	0.88	0.29	0.26	0.02	0.23	0.08	0.03	0.30	0.67	0.02	0.01	0.22	0.44
Exact p-value BCC - Cash = 0	0.98	0.97	1.00	0.13	0.54	0.90	0.67	0.19	0.09	0.00	0.10	0.33	0.82
Number of observations	2,639	2,639	2,639	2,639	2,639	2,639	2,639	2,639	2,639	2,639	2,639	2,639	2,639
R2	0.011	0.017	0.007	0.016	0.013	0.030	0.029	0.010	0.009	0.019	0.015	0.009	0.005
Mean in control (predicted beneficiaries)	-0.014	0.788	0.568	-0.046	0.134	0.572	0.750	0.371	0.200	0.434	0.234	0.298	0.066

Notes: Components of discipline index in Table 3. Sub-index standardized with respect to the full control group. The table presents ITT estimates for the impact of cash transfers and the behavioral change component on predicted beneficiary households (based on the specification in equation (1)). OLS estimates based on regressions including strata fixed effects and sampling weights. Robust (White-Huber) standard-errors are clustered by village clusters. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1 (based on asymptotic p-values). Exact randomization-t p-values, obtained from 2000 simulations, accounting for stratified randomization (Young, 2018).

**Table A5: Parenting practices (ITT at village level)**

	Nutrition		Health		Stimulation		Child protection		
	Nutrition Practice Index (12-23 months old)	Dietary Diversity	Preventive Health Practice Index	Sick	Consulted if sick	Stimulation Index	Stimulation material index	Discipline Index	Has birth certificate
BCC (Value-Added)	0.350*** (0.131)	0.294*** (0.068)	0.206** (0.080)	-0.036 (0.036)	0.098*** (0.036)	0.377*** (0.118)	0.237*** (0.078)	0.170** (0.073)	0.003 (0.027)
Cash	-0.025 (0.111)	-0.066 (0.077)	0.041 (0.075)	0.082** (0.036)	0.003 (0.033)	-0.087 (0.127)	-0.035 (0.073)	0.023 (0.085)	0.022 (0.028)
p for BCC + Cash = 0	0.01	0.00	0.00	0.21	0.01	0.00	0.00	0.01	0.36
p for BCC - Cash = 0	0.07	0.01	0.21	0.06	0.10	0.04	0.05	0.29	0.69
Exact p-value BCC	0.01	0.00	0.01	0.34	0.01	0.00	0.00	0.02	0.93
Exact p-value Cash	0.84	0.39	0.58	0.03	0.94	0.52	0.66	0.78	0.45
Randomization t joint test	0.02	0.00	0.01	0.09	0.01	0.00	0.00	0.02	0.64
Exact p-value BCC + Cash = 0	0.02	0.00	0.00	0.22	0.01	0.00	0.00	0.02	0.37
Exact p-value BCC - Cash = 0	0.07	0.01	0.23	0.06	0.12	0.05	0.05	0.32	0.70
Number of observations	1,115	5,273	5,133	5,229	2,007	5,271	5,272	5,271	5,211
R2	0.082	0.046	0.052	0.035	0.035	0.053	0.018	0.011	0.033
Mean in control	-0.017	-0.009	-0.015	0.342	0.646	0.004	0.009	0.002	0.866

Notes: ITT at village level are obtained by estimating equation (1) among all baseline households interviewed at follow-up, irrespective of whether they are predicted beneficiaries or not. OLS estimates based on regressions including strata fixed effects and sampling weights. Robust (White-Huber) standard-errors are clustered by village clusters. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1 (based on asymptotic p-values). Exact randomization-t p-values, obtained from 2000 simulations, accounting for stratified randomization (Young, 2018).

**Table A6: Parenting practices (Value-added of BCC for cash transfer beneficiaries)**

	Nutrition		Health		Stimulation		Child protection		
	Nutrition Practice Index (12-23 months old)	Dietary Diversity	Preventive Health Practice Index	Sick	Consulted if sick	Stimulation Index	Stimulation material index	Discipline Index	Has birth certificate
BCC (Value-Added)	0.441*** (0.136)	0.285*** (0.071)	0.205** (0.082)	-0.075** (0.035)	0.066* (0.035)	0.218* (0.129)	0.118 (0.091)	0.272*** (0.083)	0.021 (0.027)
Exact p-value	0.00	0.00	0.02	0.04	0.07	0.11	0.23	0.00	0.46
Number of observations	706	3,262	3,181	3,220	1,213	3,262	3,263	3,261	3,220
R2	0.064	0.050	0.052	0.033	0.030	0.041	0.010	0.031	0.049
Mean in cash only group (beneficiaries)	-0.085	0.016	0.037	0.403	0.650	0.017	0.043	0.052	0.877

Notes: See Table A8 for components of the nutrition practice index and the preventive health practice index, Table A9 for components of the stimulation index and stimulation material index, and Table A10 for components of the discipline index. Indices are standardized with respect to the full control group. The food consumption score is used to measure dietary diversity for children. The table isolates the value-added of the behavioral change promotion on actual cash transfer beneficiaries (based on the specification in equation (2)). OLS estimates based on regressions including strata fixed effects and sampling weights. Robust (White-Huber) standard-errors are clustered by village clusters. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1 (based on asymptotic p-values). Exact randomization-t p-values, obtained from 2000 simulations, accounting for stratified randomization (Young, 2018).

**Table A7: Impact on parenting practices for baseline households surveyed at follow-up ( Value-added of BCC for cash transfer beneficiaries, excluding booster sample)**

	Nutrition		Health		Stimulation		Child protection		
	Nutrition Practice Index (12-23 months old)	Dietary Diversity	Preventive Health Practice Index	Sick	Consulted if sick	Stimulation Index	Stimulation material index	Discipline Index	Has birth certificate
BCC (Value-Added)	0.239 (0.184)	0.331*** (0.083)	0.247** (0.098)	-0.100** (0.043)	0.122*** (0.041)	0.262* (0.133)	0.130 (0.098)	0.288*** (0.102)	0.020 (0.034)
Exact p-value	0.22	0.00	0.02	0.03	0.00	0.06	0.20	0.01	0.60
Number of observations	364	1,679	1,639	1,664	644	1,679	1,679	1,678	1,655
R2	0.024	0.069	0.042	0.049	0.059	0.074	0.017	0.037	0.051
Mean in cash only group (beneficiaries)	-0.085	0.016	0.037	0.403	0.650	0.017	0.043	0.052	0.877

Notes: Robustness of results in Table A6 (value-added of the behavioral change promotion on actual cash transfer beneficiaries) without booster sample. Indices are standardized with respect to the full control group. The food consumption score is used to measure dietary diversity for children. OLS estimates based on regressions including strata fixed effects and sampling weights. Robust (White-Huber) standard-errors are clustered by village clusters. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1 (based on asymptotic p-values). Exact randomization-t p-values, obtained from 2000 simulations, accounting for stratified randomization (Young, 2018).

**Table A8: Components of nutrition and health indices (Value-added of BCC for cash transfer beneficiaries)**

	Nutrition Practice Index (for children 12-23 months old)										Preventive Health Practice Index					
	Exclusively breastfed for 6 months (sub- index)	Number of complement ary food types (sub- index)	Vitamin	Juice	Rehydratati on solution	Prepared food	Milk	Liquid	Solid food	Cereals	Completed vaccines	Received vitamin A	Received iron	Received deworming	Caregiver washes hand with soap	Sleep under treated mosquito net
BCC (Value-Added)	0.356*** (0.101)	0.247* (0.145)	0.022 (0.037)	0.034 (0.026)	0.024 (0.018)	0.043 (0.064)	0.072* (0.039)	0.024** (0.010)	-0.025* (0.013)	0.059** (0.027)	0.026 (0.032)	0.022 (0.016)	0.049 (0.044)	0.043* (0.025)	0.065** (0.025)	0.040 (0.036)
Exact p-value	0.00	0.10	0.54	0.19	0.19	0.53	0.07	0.00	0.07	0.03	0.44	0.17	0.27	0.10	0.01	0.29
Number of observations	706	706	706	706	706	706	706	706	706	706	3,181	3,181	3,181	3,181	3,181	3,181
R2	0.128	0.037	0.055	0.065	0.020	0.022	0.042	0.025	0.012	0.053	0.046	0.038	0.020	0.052	0.074	0.046
Mean in cash only group (beneficiaries)	-0.131	0.012	0.175	0.102	0.026	0.184	0.506	0.977	0.977	0.047	0.616	0.908	0.173	0.675	0.784	0.139

Notes: Components of nutrition practice index and preventive health practice index in Table A6. Sub-indices are standardized with respect to the full control group. The table isolates the value-added of the behavioral change promotion on actual cash transfer beneficiaries (based on the specification in equation (2)). OLS estimates based on regressions including strata fixed effects and sampling weights. Robust (White-Huber) standard-errors are clustered by village clusters. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1 (based on asymptotic p-values). Exact randomization-t p-values, obtained from 2000 simulations, accounting for stratified randomization (Young, 2018).

**Table A9: Components of stimulation indices (Value-added of BCC for cash transfer beneficiaries)**

	Stimulation index							Stimulation material index					
	Read	Tell stories	Take walks together	Play	Name	Count	Draw	Play with homemade toy	Play with manufactured toys	Play with household object	Play with animals	Play with toy that can be pulled	Play with balls
BCC (Value-Added)	0.026** (0.010)	0.098** (0.043)	0.066 (0.054)	0.044 (0.051)	0.038 (0.046)	0.060** (0.029)	0.050* (0.029)	-0.025 (0.049)	0.072** (0.030)	-0.019 (0.019)	0.007 (0.018)	0.028 (0.046)	0.098*** (0.033)
Exact p-value	0.01	0.03	0.24	0.40	0.43	0.05	0.09	0.63	0.02	0.34	0.70	0.57	0.00
Number of observations	3,262	3,262	3,262	3,262	3,262	3,262	3,262	3,263	3,263	3,263	3,263	3,263	3,263
R2	0.034	0.025	0.052	0.018	0.029	0.027	0.022	0.019	0.029	0.015	0.009	0.007	0.023
Mean in cash only group (beneficiaries)	0.031	0.407	0.685	0.714	0.356	0.270	0.119	0.604	0.184	0.916	0.828	0.479	0.290

Notes: Components of stimulation and stimulation material indices in Table A6. The table isolates the value-added of the behavioral change promotion on actual cash transfer beneficiaries (based on the specification in equation (2)). OLS estimates based on regressions including strata fixed effects and sampling weights. Robust (White-Huber) standard-errors are clustered by village clusters. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1 (based on asymptotic p-values). Exact randomization-t p-values, obtained from 2000 simulations, accounting for stratified randomization (Young, 2018).



**Table A10: Components of discipline index (Value-added of BCC for cash transfer beneficiaries)**

	Positive discipline sub-index	Discipline by explaining	Discipline by re-directing	Negative discipline sub-index	Forbid	Shake	Yell	Spank	Spank with an object	Berate	Slap	Hit on hands	Hit with an object
BCC (Value-Added)	-0.040 (0.053)	-0.019 (0.025)	-0.011 (0.031)	-0.259*** (0.082)	-0.023 (0.018)	-0.071** (0.032)	-0.076* (0.039)	-0.082** (0.039)	-0.061** (0.030)	-0.158*** (0.033)	-0.069*** (0.022)	-0.063** (0.027)	-0.019 (0.012)
Exact p-value	0.48	0.47	0.73	0.00	0.22	0.03	0.07	0.04	0.05	0.00	0.00	0.03	0.13
Number of observations	3,261	3,261	3,261	3,261	3,261	3,261	3,261	3,261	3,261	3,261	3,261	3,261	3,261
R2	0.010	0.009	0.013	0.031	0.018	0.019	0.030	0.023	0.022	0.033	0.015	0.019	0.006
Mean in cash only group (beneficiaries)	-0.040	0.758	0.578	-0.059	0.118	0.529	0.708	0.383	0.245	0.463	0.246	0.278	0.059

Notes: Components of discipline index in Table A6. Sub-index standardized with respect to the full control group. The table isolates the value-added of the behavioral change promotion on actual cash transfer beneficiaries (based on the specification in equation (2)). OLS estimates based on regressions including strata fixed effects and sampling weights. Robust (White-Huber) standard-errors are clustered by village clusters. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1 (based on asymptotic p-values). Exact randomization-t p-values, obtained from 2000 simulations, accounting for stratified randomization (Young, 2018).

**Table A11: Early childhood nutrition and development outcomes (Value-added of BCC for cash transfer beneficiaries)**

	<u>Anthropometrics</u>		<u>Child Development</u>		
	Height for age	Weight for height	Weight for age	Cognitive Score	Socio-Emotional Score
BCC (Value-Added)	-0.037 (0.051)	0.001 (0.044)	-0.052 (0.050)	-0.049 (0.058)	0.172** (0.067)
Exact p-value	0.48	0.98	0.32	0.41	0.01
Number of observations	3,014	2,919	2,976	2,049	2,033
R2	0.027	0.014	0.030	0.006	0.041
Mean in cash only group (beneficiaries)	-0.107	-0.033	-0.096	-0.059	-0.098

Notes: Height-for-age (used to identify stunting), weight-for-height (used to identify wasting) and weight-for-age (used to identify underweight) are z scores for children aged 6-59 at the time of the follow-up survey. Cognitive (Bayley™) score is a z score for children aged 6-42 months at the time of the follow-up survey. Socio-emotional development (strength-and-difficulties) score is a z score for children aged 24-59 months at the time of the follow-up survey. All z scores are standardized with respect to the full control group. The table isolates the value-added of the behavioral change promotion on actual cash transfer beneficiaries (based on the specification in equation (2)). OLS estimates based on regressions including strata fixed effects and sampling weights. Robust (White-Huber) standard-errors are clustered by village clusters. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1 (based on asymptotic p-values). Exact randomization-t p-values, obtained from 2000 simulations, accounting for stratified randomization (Young, 2018).

**Table A12: Early childhood nutrition and development outcomes for baseline households surveyed at follow-up  
(Value-added of BCC for cash transfer beneficiaries, excluding booster sample)**

	Height for age	Weight for height	Weight for age	Cognitive Score	Socio-Emotional Score
BCC (Value-Added)	-0.045 (0.068)	0.034 (0.057)	-0.040 (0.062)	0.026 (0.076)	0.223*** (0.082)
Exact p-value	0.52	0.56	0.53	0.73	0.01
Number of observations	1,549	1,496	1,521	1,056	1,054
R2	0.025	0.016	0.032	0.011	0.045
Mean in cash only group (beneficiaries)	-0.107	-0.033	-0.096	-0.059	-0.098

Notes: Robustness of results in Table A11 (value-added of the behavioral change promotion on actual cash transfer beneficiaries) without booster sample. Height-for-age (used to identify stunting), weight-for-height (used to identify wasting) and weight-for-age (used to identify underweight) are z scores for children aged 6-59 at the time of the follow-up survey. Cognitive (Bayley™) score is a z score for children aged 6-42 months at the time of the follow-up survey. Socio-emotional development (strength-and-difficulties) score is a z score for children aged 24-59 months at the time of the follow-up survey. All z scores are standardized with respect to the full control group. OLS estimates based on regressions including strata fixed effects and sampling weights. Robust (White-Huber) standard-errors are clustered by village clusters. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1 (based on asymptotic p-values). Exact randomization-t p-values, obtained from 2000 simulations, accounting for stratified randomization (Young, 2018).

**Table A13: Early childhood nutrition and development outcomes (ITT at village level)**

	Anthropometrics			Child Development	
	Height for age	Weight for height	Weight for age	Cognitive Score	Socio-Emotional Score
BCC (Value-Added)	-0.044 (0.052)	0.063 (0.038)	-0.016 (0.048)	0.010 (0.054)	0.181*** (0.062)
Cash	-0.037 (0.056)	-0.043 (0.038)	-0.095** (0.046)	-0.042 (0.047)	-0.095 (0.063)
p for BCC + Cash = 0	0.07	0.58	0.02	0.55	0.19
p for BCC - Cash = 0	0.94	0.12	0.34	0.55	0.01
Exact p-value BCC	0.41	0.10	0.75	0.86	0.00
Exact p-value Cash	0.53	0.26	0.04	0.39	0.14
Randomization t joint test	0.21	0.27	0.04	0.68	0.01
Exact p-value BCC + Cash = 0	0.08	0.59	0.02	0.54	0.20
Exact p-value BCC - Cash = 0	0.95	0.14	0.34	0.54	0.01
Number of observations	4,920	4,727	4,812	3,263	3,344
R2	0.032	0.014	0.031	0.010	0.027
Mean in control (predicted beneficiaries)	-0.031	0.001	-0.005	-0.054	0.005

Notes: Height-for-age (used to identify stunting), weight-for-height (used to identify wasting) and weight-for-age (used to identify underweight) are z scores for children aged 6-59 at the time of the follow-up survey. Cognitive (Bayley™) score is a z score for children aged 6-42 months at the time of the follow-up survey. Socio-emotional development (strength-and-difficulties) score is a z score for children aged 24-59 months at the time of the follow-up survey. All z scores are standardized with respect to the full control group. ITT at village level are obtained by estimating equation (1) among all baseline households interviewed at follow-up, irrespective of whether they are predicted beneficiaries or not. OLS estimates based on regressions including strata fixed effects and sampling weights. Robust (White-Huber) standard-errors are clustered by village clusters. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1 (based on asymptotic p-values). Exact randomization-t p-values, obtained from 2000 simulations, accounting for stratified randomization (Young, 2018).

**Table A14: Robustness of impacts on anthropometric variables depending on treatment of outliers (ITT for predicted beneficiaries)**

	Height for age (trimmed at 2nd and 98th percentiles) a\	Height for age (trimmed at 5th and 95th percentiles) a\	Height for age (trimmed using the interquartile range) b\	Weight for height (trimmed at 2nd and 98th percentiles) a\	Weight for height (trimmed at 5th and 95th percentiles) a\	Weight for height (trimmed using the interquartile range) b\	Weight for age (trimmed at 2nd and 98th percentiles) a\	Weight for age (trimmed at 5th and 95th percentiles) a\	Weight for age (trimmed using the interquartile range) b\
BCC (Value-Added)	0.007 (0.064)	-0.017 (0.035)	-0.011 (0.041)	0.003 (0.059)	0.005 (0.049)	0.002 (0.054)	-0.019 (0.063)	0.015 (0.049)	-0.003 (0.063)
Cash	-0.117 (0.074)	-0.075* (0.042)	-0.106** (0.046)	0.057 (0.055)	0.032 (0.047)	0.027 (0.049)	-0.053 (0.070)	-0.073 (0.054)	-0.064 (0.068)
p for BCC + Cash = 0	0.07	0.01	0.01	0.28	0.39	0.58	0.26	0.27	0.31
p for BCC - Cash = 0	0.32	0.39	0.21	0.59	0.76	0.78	0.77	0.32	0.59
Exact p-value BCC	0.91	0.63	0.81	0.96	0.92	0.98	0.76	0.76	0.96
Exact p-value Cash	0.11	0.07	0.03	0.32	0.51	0.60	0.47	0.19	0.38
Randomization t joint test	0.17	0.05	0.02	0.47	0.67	0.81	0.54	0.42	0.56
Exact p-value BCC + Cash = 0	0.08	0.01	0.01	0.27	0.40	0.60	0.26	0.26	0.32
Exact p-value BCC - Cash = 0	0.34	0.38	0.23	0.58	0.75	0.79	0.77	0.33	0.62
Number of observations	2,460	2,369	2,569	2,371	2,272	2,471	2,393	2,349	2,572
R2	0.039	0.038	0.042	0.017	0.016	0.023	0.031	0.038	0.038
Mean in control (predicted beneficiaries)	-0.027	0.040	0.047	-0.046	-0.023	-0.019	-0.059	-0.035	-0.021

Notes: Robustness of results in Table 4 to alternative treatment of outliers. Height-for-age (used to identify stunting), weight-for-height (used to identify wasting) and weight-for-age (used to identify underweight) are z scores for children aged 6-59 at the time of the follow-up survey. All z scores are standardized with respect to the full control group. OLS estimates based on regressions including strata fixed effects and sampling weights. Robust (White-Huber) standard-errors are clustered by village clusters. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1 (based on asymptotic p-values). Exact randomization-t p-values, obtained from 2000 simulations, accounting for stratified randomization (Young, 2018).

a\ Observations below the lower percentile and above the higher percentile set to missing

b\ Observations below  $p_{25}-1.5*(p_{75}-p_{25})$  and above  $p_{75}+1.5*(p_{75}-p_{25})$  set to missing

**Table A15: Robustness of impacts on anthropometric variables depending on treatment of outliers (Value-added of BCC for cash transfer beneficiaries)**

	Height for age (trimmed at 2nd and 98th percentiles) a\	Height for age (trimmed at 5th and 95th percentiles) a\	Height for age (trimmed using the interquartile range) b\	Weight for height (trimmed at 2nd and 98th percentiles) a\	Weight for height (trimmed at 5th and 95th percentiles) a\	Weight for height (trimmed using the interquartile range) b\	Weight for age (trimmed at 2nd and 98th percentiles) a\	Weight for age (trimmed at 5th and 95th percentiles) a\	Weight for age (trimmed using the interquartile range) b\
BCC (Value-Added)	-0.037 (0.051)	-0.043 (0.030)	-0.030 (0.036)	0.001 (0.044)	0.020 (0.034)	-0.005 (0.045)	-0.052 (0.050)	-0.033 (0.043)	-0.041 (0.052)
Exact p-value	0.48	0.16	0.40	0.98	0.58	0.92	0.32	0.46	0.43
Number of observations	3,014	2,896	3,146	2,919	2,812	3,047	2,976	2,905	3,174
R2	0.027	0.026	0.033	0.014	0.015	0.015	0.030	0.032	0.030
Mean in cash only group (beneficiaries)	-0.107	-0.010	-0.018	-0.033	-0.019	-0.013	-0.096	-0.069	-0.053

Notes: Robustness of results in Table A11 to alternative treatment of outliers. Height-for-age (used to identify stunting), weight-for-height (used to identify wasting) and weight-for-age (used to identify underweight) are z scores for children aged 6-59 at the time of the follow-up survey. All z scores are standardized with respect to the full control group. OLS estimates based on regressions including strata fixed effects and sampling weights. Robust (White-Huber) standard-errors are clustered by village clusters. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1 (based on asymptotic p-values). Exact randomization-t p-values, obtained from 2000 simulations, accounting for stratified randomization (Young, 2018).

a\ Observations below the lower percentile and above the higher percentile set to missing

b\ Observations below  $p_{25}-1.5*(p_{75}-p_{25})$  and above  $p_{75}+1.5*(p_{75}-p_{25})$  set to missing

**Table A16: Food Security and Household Consumption (Value-added of BCC for cash transfer beneficiaries)**

	Dietary Diversity (Food consumption score)	Household Dietary Diversity Score	Mother brachial perimeter	Total consumption pc	Food consumption pc	Non food consumption pc	Education and Health expenditures pc	Share of food consumption in total consumption	Adults (private) non-food consumption n items	Children (private) non-food consumption n items	Household reported higher food prices
BCC (Value-Added)	-3.082 (2.059)	-0.369 (0.249)	-1.586 (1.712)	-4,908.080 (5,199.494)	-983.170 (3,198.500)	-2,744.360 (1,810.867)	-1,180.549 (1,347.038)	0.016 (0.014)	-87.095 (217.190)	-19.975 (117.412)	-0.005 (0.042)
Exact p-value	0.14	0.15	0.37	0.37	0.77	0.15	0.40	0.25	0.73	0.88	0.92
Number of observations	1,877	1,907	2,136	1,875	1,875	1,875	1,875	1,875	1881	1889	1908
R2	0.04	0.04	0.02	0.09	0.06	0.06	0.05	0.06	0.06	0.02	0.01
Mean in cash only group (beneficiaries)	45.6	4.48	258.0	118,198.6	76,795.2	26,760.1	14,643.3	0.66	1,901.3	1,190.4	0.31

Notes: The food consumption score is used to measure dietary diversity. Consumption and expenditure variables in local currency (FCFA). The exchange rate was 1 USD = 497 CFA francs (FCFA) on January 1, 2013, and 1 USD = 541 CFA francs (FCFA) on January 1, 2015. The table isolates the value-added of the behavioral change promotion on actual cash transfer beneficiaries (based on the specification in equation (2)). OLS estimates based on regressions including strata fixed effects and sampling weights. Robust (White-Huber) standard-errors are clustered by village clusters. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1 (based on asymptotic p-values). Exact randomization-t p-values, obtained from 2000 simulations, accounting for stratified randomization (Young, 2018).

**Table A17: Effects on food prices and likelihood of food item purchase between village clusters**

<b>(A) Impact on food prices (z-scores based on survey unit value) for selected food products purchased a\</b>										
	Millet	Baobab leaves	Dried tomatoes	Corn	Fresh dairy products	Dried legumes	Fresh legumes, roots and tubers	Processed legumes	Goat meat	Sorgho
BCC (Value-Added)	-0.086 (0.101)	0.110 (0.152)	0.135 (0.195)	0.049 (0.159)	0.235 (0.309)	0.127 (0.283)	0.078 (0.215)	-0.030 (0.141)	0.209 (0.224)	-0.184 (0.215)
Cash	-0.031 (0.096)	0.141 (0.150)	-0.231 (0.194)	-0.078 (0.160)	-0.150 (0.308)	0.120 (0.298)	0.118 (0.209)	0.073 (0.139)	-0.327 (0.217)	0.071 (0.235)
p for BCC + Cash = 0	0.26	0.10	0.63	0.86	0.78	0.41	0.37	0.76	0.61	0.62
Exact p-value BCC	0.39	0.51	0.46	0.77	0.44	0.65	0.71	0.85	0.38	0.29
Exact p-value Cash	0.73	0.35	0.23	0.65	0.61	0.72	0.59	0.60	0.14	0.77
Randomization t joint test	0.52	0.21	0.48	0.90	0.75	0.77	0.66	0.87	0.33	0.54
Number of observations	107	122	137	132	65	68	112	96	91	32
R2	0.638	0.281	0.089	0.424	0.131	0.159	0.129	0.132	0.225	0.608
Mean z-score	0.230	-0.006	0.048	0.009	0.066	-0.021	-0.046	-0.272	0.170	0.046
Mean unit value (Local currency)	371.988	53.333	93.841	470.644	80.166	88.832	337.139	5.982	967.057	323.214
<b>(B) Impact on likelihood that any household in the village purchases (selected) food products b\</b>										
	Millet	Baobab leaves	Dried tomatoes	Corn	Fresh dairy products	Dried legumes	Fresh legumes, roots and tubers	Processed legumes	Goat meat	Sorgho
BCC (Value-Added)	0.063 (0.070)	0.055 (0.054)	-0.013 (0.040)	-0.010 (0.056)	-0.036 (0.093)	0.095 (0.100)	-0.012 (0.079)	0.161* (0.083)	0.053 (0.095)	-0.087 (0.071)
Cash	-0.049 (0.069)	-0.093* (0.053)	-0.093** (0.039)	-0.080 (0.055)	-0.009 (0.092)	-0.172* (0.099)	-0.027 (0.078)	-0.137* (0.082)	-0.035 (0.094)	0.020 (0.070)
p for BCC + Cash = 0	0.83	0.48	0.01	0.10	0.62	0.44	0.62	0.77	0.85	0.33
Exact p-value BCC	0.33	0.27	0.65	0.75	0.71	0.35	0.84	0.06	0.57	0.26
Exact p-value Cash	0.54	0.08	0.03	0.18	0.96	0.08	0.73	0.10	0.70	0.82
Randomization t joint test	0.60	0.21	0.10	0.25	0.90	0.23	0.87	0.14	0.86	0.46
Number of observations	152	152	152	152	152	152	152	152	152	152
R2	0.332	0.223	0.375	0.258	0.220	0.112	0.210	0.283	0.151	0.454
Share of hh purchasing product	0.212	0.135	0.115	0.154	0.577	0.596	0.250	0.346	0.385	0.731

Notes: Unit value are in local currency (FCFA). The exchange rate was 1 USD = 497 CFA francs (FCFA) on January 1, 2013, and 1 USD = 541 CFA francs (FCFA) on January 1, 2015. OLS estimates based on regressions including strata fixed effects and sampling weights. Robust (White-Huber) standard-errors are clustered by village clusters. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1 (based on asymptotic p-values). Exact randomization-t p-values, obtained from 2000 simulations, accounting for stratified randomization (Young, 2018).

a\ Prices approximated by median unit values at cluster level. Dependent variables correspond to standardized z-scores for the natural logarithm of each price. Food items selected if at least 10% of households in the sample consume them, at least 5 household per village report consumption, and if there is a well-defined unit of measurement. Millet, baobab leaves, dried tomato, corn, goat meat and sorgho represent median values in village cluster. Other prices are aggregates that weight each item by its mean share in the budgets among all households. Fresh dairy products include prices of fresh milk and milk curd; dried legumes include dried beans and dried gombo; fresh legumes, roots and tubers include sweet potato and onions; processed legumes include peanut paste and beans beignets.

b\ The dependent variables are set to 1 if the median unit value at cluster level is missing and 0 otherwise.



**Table A18: Assets and savings (Value-added of BCC for cash transfer beneficiaries)**

	# Household Durable Goods	# Household productive assets	Livestock (TLU index)	Participated in savings group (tontines)	Weekly amount contributed in tontines
BCC (Value-Added)	-0.803** (0.374)	0.137 (0.285)	0.077 (0.091)	0.015 (0.034)	-20.7 (66.1)
Exact p-value	0.04	0.63	0.42	0.67	0.76
Number of observations	1,887	1,889	1,896	1,906	1,905
R2	0.039	0.013	0.099	0.047	0.014
Mean in cash only group (beneficiaries)	5.296	6.531	1.468	0.375	293.0

Notes: Weekly amount contributed to savings group in local currency (FCFA). Livestock index in Tropical Livestock Unit (TLU). The exchange rate was 1 USD = 497 CFA francs (FCFA) on January 1, 2013, and 1 USD = 541 CFA francs (FCFA) on January 1, 2015. The table isolates the value-added of the behavioral change promotion on actual cash transfer beneficiaries (based on the specification in equation (2)). OLS estimates based on regressions including strata fixed effects and sampling weights. Robust (White-Huber) standard-errors are clustered by village clusters. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1 (based on asymptotic p-values). Exact randomization-t p-values, obtained from 2000 simulations, accounting for stratified randomization (Young, 2018).

**Table A19: Impact on human development outcomes of other household members (Value-added of BCC for cash transfer beneficiaries)**

	School enrollment (children 6-14)	# of school days missed (children 6-14)	Sick (children 5-14)	Consulted if sick (children 5-14)	Sick (adults 15+)	Consulted if sick (adults 15+)	Pregnant over last 12 months (adult women)	Uses contraception (adult women)
BCC (Value-Added)	-0.019 (0.031)	-0.065 (0.050)	-0.035 (0.026)	0.113*** (0.039)	-0.032 (0.034)	0.064** (0.028)	-0.022 (0.024)	-0.019 (0.015)
Exact p-value (rand-t, 2000 simulations, stratified)	0.54	0.21	0.19	0.01	0.37	0.03	0.40	0.23
Number of observations	7,178	4,056	7,816	1,794	8,024	2,617	4,596	4,596
R2	0.028	0.008	0.022	0.040	0.026	0.025	0.007	0.019
Mean in cash only group (beneficiaries)	0.550	0.261	0.238	0.406	0.345	0.482	0.433	0.084

Notes: The table isolates the value-added of the behavioral change promotion on actual cash transfer beneficiaries (based on the specification in equation (2)). OLS estimates based on regressions including strata fixed effects and sampling weights. Robust (White-Huber) standard-errors are clustered by village clusters. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1 (based on asymptotic p-values). Exact randomization-t p-values, obtained from 2000 simulations, accounting for stratified randomization (Young, 2018).

**Table A20: Components of nutrition and health indices (Spillovers of BCC for cash transfer non-beneficiaries)**

	Nutrition Practice Index (for children 12-23 months old)										Preventive Health Practice Index					
	Exclusively breastfed for 6 months (sub-index)	Number of compleme ntary food types (sub- index)	Vitamin	Juice	Rehydratati on solution	Prepared food	Milk	Liquid	Solid food	Cereals	Completed vaccines	Received vitamin A	Received iron	Received deworming	Caregiver washes hand with soap	Sleep under treated mosquito net
BCC (Value-Added)	0.179* (0.101)	0.218 (0.135)	0.011 (0.041)	0.043 (0.036)	0.016 (0.016)	0.030 (0.070)	0.086 (0.060)	-0.027 (0.017)	0.005 (0.021)	0.053** (0.026)	0.023 (0.040)	0.000 (0.022)	0.062 (0.038)	-0.004 (0.031)	0.002 (0.033)	0.062 (0.045)
Exact p-value	0.10	0.14	0.79	0.28	0.37	0.71	0.18	0.11	0.83	0.05	0.61	1.00	0.14	0.91	0.96	0.20
Number of observations	403	403	403	403	403	403	403	403	403	403	1,809	1,809	1,809	1,809	1,809	1,809
R2	0.177	0.050	0.041	0.025	0.012	0.051	0.052	0.127	0.014	0.077	0.055	0.034	0.071	0.054	0.028	0.060
Mean in cash only group (non beneficiarie	-0.171	-0.028	0.156	0.117	0.044	0.156	0.439	0.995	0.971	0.073	0.594	0.913	0.193	0.660	0.791	0.162

Notes: Components of nutrition practice index and preventive health practice index in Table 9. Sub-indices are standardized with respect to the full control group. The table isolates the spillover of the behavioral change promotion on actual cash transfer non-beneficiaries (based on the specification in equation (3)). OLS estimates based on regressions including strata fixed effects and sampling weights. Robust (White-Huber) standard-errors are clustered by village clusters. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1 (based on asymptotic p-values). Exact randomization-t p-values, obtained from 2000 simulations, accounting for stratified randomization (Young, 2018).

**Table A21: Components of stimulation indices (Spillovers of BCC for cash transfer non-beneficiaries)**

	Stimulation index							Stimulation material index					
	Read	Tell stories	Take walks together	Play	Name	Count	Draw	Play with homemade toy	Play with manufactured toys	Play with household object	Play with animals	Play with toy that can be pulled	Play with balls
BCC (Value-Added)	-0.001 (0.009)	0.198*** (0.052)	0.123** (0.061)	0.098** (0.037)	0.080** (0.039)	0.101*** (0.032)	0.046* (0.024)	0.047 (0.036)	0.020 (0.034)	0.061* (0.034)	0.042 (0.026)	0.086* (0.044)	0.128*** (0.035)
Exact p-value	0.95	0.00	0.08	0.01	0.05	0.01	0.06	0.22	0.57	0.11	0.11	0.06	0.00
Number of observations	1,867	1,867	1,867	1,867	1,867	1,867	1,867	1,868	1,868	1,868	1,868	1,868	1,868
R2	0.022	0.062	0.053	0.039	0.035	0.039	0.015	0.019	0.044	0.043	0.014	0.032	0.041
Mean in cash only group (non beneficiaries)	0.027	0.352	0.636	0.685	0.332	0.237	0.096	0.602	0.199	0.858	0.813	0.478	0.268

Notes: Components of stimulation and stimulation material indices in Table 9. The table isolates the spillover of the behavioral change promotion on actual cash transfer non-beneficiaries (based on the specification in equation (3)). OLS estimates based on regressions including strata fixed effects and sampling weights. Robust (White-Huber) standard-errors are clustered by village clusters. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1 (based on asymptotic p-values). Exact randomization-t p-values, obtained from 2000 simulations, accounting for stratified randomization (Young, 2018).

**Table A22: Components of discipline index (Spillovers of BCC for cash transfer non-beneficiaries)**

	Positive discipline sub-index	Discipline by explaining	Discipline by re-directing	Negative discipline sub-index	Forbid	Shake	Yell	Spank	Spank with an object	Berate	Slap	Hit on hands	Hit with an object
BCC (Value-Added)	0.135** (0.059)	0.027 (0.035)	0.073*** (0.025)	-0.007 (0.082)	0.006 (0.030)	0.055* (0.032)	0.005 (0.034)	0.025 (0.041)	0.010 (0.038)	-0.085*** (0.032)	-0.015 (0.027)	-0.018 (0.032)	0.001 (0.017)
Exact p-value	0.04	0.48	0.01	0.93	0.85	0.10	0.88	0.55	0.81	0.02	0.59	0.58	0.95
Number of observations	1,868	1,868	1,868	1,868	1,868	1,868	1,868	1,868	1,868	1,868	1,868	1,868	1,868
R2	0.010	0.010	0.013	0.007	0.036	0.012	0.011	0.023	0.011	0.014	0.009	0.006	0.006
Mean in cash only group (non beneficiaries)	-0.116	0.724	0.556	-0.041	0.127	0.491	0.692	0.398	0.252	0.465	0.260	0.323	0.063

Notes: Components of discipline index in Table 9. Sub-index standardized with respect to the full control group. The table isolates the spillover of the behavioral change promotion on actual cash transfer non-beneficiaries (based on the specification in equation (3)). OLS estimates based on regressions including strata fixed effects and sampling weights. Robust (White-Huber) standard-errors are clustered by village clusters. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1 (based on asymptotic p-values). Exact randomization-t p-values, obtained from 2000 simulations, accounting for stratified randomization (Young, 2018).

**Table A23: Robustness of impacts on anthropometric variables depending on treatment of outliers (Spillovers of BCC for cash transfer non-beneficiaries)**

	Height for age (trimmed at 2nd and 98th percentiles) a\	Height for age (trimmed at 5th and 95th percentiles) a\	Height for age (trimmed using the interquartile range) b\	Weight for height (trimmed at 2nd and 98th percentiles) a\	Weight for height (trimmed at 5th and 95th percentiles) a\	Weight for height (trimmed using the interquartile range) b\	Weight for age (trimmed at 2nd and 98th percentiles) a\	Weight for age (trimmed at 5th and 95th percentiles) a\	Weight for age (trimmed using the interquartile range) b\
BCC (Value-Added)	-0.055 (0.052)	-0.055* (0.031)	-0.056 (0.039)	0.048 (0.053)	0.027 (0.045)	0.029 (0.050)	-0.027 (0.063)	0.021 (0.054)	-0.034 (0.061)
Exact p-value	0.31	0.09	0.17	0.38	0.56	0.58	0.69	0.71	0.61
Number of observations	1,748	1,688	1,825	1,676	1,606	1,739	1,704	1,684	1,822
R2	0.019	0.020	0.027	0.028	0.023	0.029	0.024	0.032	0.030
Mean in cash only group (beneficiaries)	-0.092	0.004	-0.011	-0.095	-0.066	-0.060	-0.091	-0.077	-0.070

Notes: Robustness of results in table 10 to alternative treatment of outliers. Height-for-age (used to identify stunting), weight-for-height (used to identify wasting) and weight-for-age (used to identify underweight) are z scores for children aged 6-59 at the time of the follow-up survey. All z scores are standardized with respect to the full control group. OLS estimates based on regressions including strata fixed effects and sampling weights. Robust (White-Huber) standard-errors are clustered by village clusters. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1 (based on asymptotic p-values). Exact randomization-t p-values, obtained from 2000 simulations, accounting for stratified randomization (Young, 2018).

a\ Observations below the lower percentile and above the higher percentile set to missing

b\ Observations below p25-1.5\*(p75-p25) and above p75+1.5\*(p75-p25) set to missing

**Table A.24: Food Security and Household Consumption (Spillovers of BCC for cash transfer non-beneficiaries)**

	Dietary Diversity (Food consumption score)	Household Dietary Diversity Score	Mother brachial perimeter	Total consumption pc	Food consumption pc	Non food consumption pc	Education and Health expenditures pc	Share of food consumption in total consumption	Adults (private) non- food consumption items	Children (private) non- food consumption items	Household reported higher food prices
BCC (Value-Added)	-2.846 (2.093)	-0.366 (0.224)	-3.653 (2.606)	1,446.632 (7,502.664)	3,022.407 (4,423.538)	-2,343.298 (2,403.543)	767.524 (1,713.807)	0.021 (0.013)	-161.639 (164.374)	-89.811 (105.374)	-0.014 (0.049)
Exact p-value	0.20	0.13	0.20	0.84	0.52	0.35	0.65	0.14	0.34	0.43	0.80
Number of observations	1,275	1,299	1,144	1,270	1,270	1,270	1,270	1,269	1,272	1,284	1,299
R2	0.05	0.08	0.06	0.09	0.07	0.07	0.05	0.06	0.11	0.03	0.02
Mean in cash only group (non beneficiaries)	45.26	4.56	256.8	132,580.5	87,184.2	31,263.1	14,133.1	0.67	2,278.6	1,269.0	0.28

Notes: The food consumption score is used to measure dietary diversity. Consumption and expenditure variables in local currency (FCFA). The exchange rate was 1 USD = 497 CFA francs (FCFA) on January 1, 2013, and 1 USD = 541 CFA francs (FCFA) on January 1, 2015. The table isolates the spillover of the behavioral change promotion on actual cash transfer non-beneficiaries (based on the specification in equation (3)). OLS estimates based on regressions including strata fixed effects and sampling weights. Robust (White-Huber) standard-errors are clustered by village clusters. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1 (based on asymptotic p-values). Exact randomization-t p-values, obtained from 2000 simulations, accounting for stratified randomization (Young, 2018).

**Table A25: Assets and savings (Spill-overs of BCC for cash transfer non-beneficiaries)**

	# Household Durable Goods	# Household productive assets	Livestock (TLU index)	Participated in savings group (tontines)	Weekly amount contributed in tontines
BCC (Value-Added)	-0.299 (0.337)	-0.009 (0.266)	0.092 (0.087)	-0.020 (0.026)	-399.0 (276.5)
Exact p-value	0.39	0.98	0.31	0.45	0.10
Number of observations	1,291	1,288	1,280	1,299	1,298
R2	0.047	0.018	0.110	0.036	0.009
Mean in cash only group (non beneficiaries)	4.906	6.074	1.368	0.206	639.8

Notes: Weekly amount contributed to savings group in local currency (FCFA). Livestock index in Tropical Livestock Unit (TLU). The exchange rate was 1 USD = 497 CFA francs (FCFA) on January 1, 2013, and 1 USD = 541 CFA francs (FCFA) on January 1, 2015. The table isolates the spill-over of the behavioral change promotion on actual cash transfer non-beneficiaries (based on the specification in equation (3)). OLS estimates based on regressions including strata fixed effects and sampling weights. Robust (White-Huber) standard-errors are clustered by village clusters. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1 (based on asymptotic p-values). Exact randomization-t p-values, obtained from 2000 simulations, accounting for stratified randomization (Young, 2018).



**Table A26: Impact on human development outcomes of other household members (Spill-overs of BCC for cash transfer non-beneficiaries)**

	School enrollment (children 6-14)	# of school days missed (children 6-14)	Sick (children 5-14)	Consulted if sick (children 5-14)	Sick (adults 15+)	Consulted if sick (adults 15+)	Pregnant over last 12 months (adult women)	Uses contraception (adult women)
BCC (Value-Added)	-0.012 (0.036)	0.035 (0.078)	-0.015 (0.025)	0.101** (0.048)	-0.029 (0.030)	0.010 (0.030)	-0.006 (0.029)	-0.019 (0.016)
Exact p-value (rand-t, 2000 simulations, stratified)	0.76	0.67	0.59	0.05	0.37	0.74	0.86	0.28
Number of observations	3,763	2,175	4,104	987	4,959	1,742	2,670	2,670
R2	0.036	0.017	0.028	0.041	0.029	0.030	0.014	0.032
Mean in cash only group (non beneficiaries)	0.573	0.288	0.238	0.423	0.353	0.507	0.412	0.089

Notes: The table isolates the spill-over of the behavioral change promotion on actual cash transfer non-beneficiaries (based on the specification in equation (3)). OLS estimates based on regressions including strata fixed effects and sampling weights. Robust (White-Huber) standard-errors are clustered by village clusters. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1 (based on asymptotic p-values). Exact randomization-t p-values, obtained from 2000 simulations, accounting for stratified randomization (Young, 2018).

**Table A27: Self-reported participation in community meetings and household visits**

	Nb of village meetings attended (last 12 months)	Nb of household visits received (last 12 months)
<b>Panel A: ITT for predicted beneficiaries (specification 1)</b>		
BCC (Value-Added)	3.077*** (0.366)	1.657*** (0.211)
Cash	0.854*** (0.306)	0.086 (0.132)
p for BCC + Cash = 0	0.000	0.000
p for BCC - Cash = 0	0.000	0.000
Exact p-value BCC	0.000	0.000
Exact p-value Cash	0.008	0.515
Randomization t joint test	0.000	0.000
Exact p-value BCC + Cash = 0	0.000	0.000
Exact p-value BCC - Cash = 0	0.000	0.000
Number of observations	2,637	2,637
R2	0.215	0.134
Mean in control (predicted beneficiaries)	0.808	0.292
<b>Panel B: Value-added of BCC for cash transfer beneficiaries (specification 2)</b>		
BCC (Value-Added)	3.755*** (0.323)	2.255*** (0.217)
Exact p-value	0.000	0.000
Number of observations	3,262	3,262
R2	0.171	0.114
Mean in cash only group (beneficiaries)	1.595	0.384
<b>Panel C: Spill-overs of BCC for cash transfer beneficiaries (specification 3)</b>		
BCC (Spill-overs)	1.730*** (0.249)	0.561*** (0.133)
Exact p-value	0.000	0.000
Number of observations	1,866	1,866
R2	0.103	0.050
Mean in cash only group (non beneficiaries)	1.111	0.371

Notes: Panel A presents ITT estimates for the impact of cash transfers and the behavioral change component on predicted beneficiary households (based on the specification in equation (1)). Panel B isolates the value-added of the behavioral change promotion on actual cash transfer beneficiaries (based on the specification in equation (2)). Panel C isolates the spill-over of the behavioral change promotion on actual cash transfer non-beneficiaries (based on the specification in equation (3)). OLS estimates based on regressions including strata fixed effects and sampling weights. Robust (White-Huber) standard-errors are clustered by village clusters. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1 (based on asymptotic p-values). Exact randomization-t p-values, obtained from 2000 simulations, accounting for stratified randomization (Young, 2018).

## Supplementary Sample Information

**Table S1: Households per cluster in listing and baseline sample**

Region - Commune - Cluster	Number of villages per cluster	Treatment status	Total households in listing	Households in listing considered for inclusion	Households in listing not considered for inclusion	Baseline sample size
Dosso- Guecheme-101	2	Control	136	119	17	30
Dosso- Guecheme-102	2	CT	189	183	6	30
Dosso- Guecheme-112	1	CT	178	176	2	30
Dosso- Guecheme-114	1	CT	69	69	0	30
Dosso- Guecheme-115	2	CT	247	247	0	30
Dosso- Guecheme-116	2	CT	235	233	2	30
Dosso- Guecheme-117	2	CT	222	222	0	30
Dosso- Guecheme-118	2	CT	265	250	15	30
Dosso- Guecheme-119	2	CT+BCC	167	167	0	30
Dosso- Guecheme-120	2	CT+BCC	195	195	0	30
Dosso- Guecheme-121	2	CT+BCC	394	382	12	30
Dosso- Guecheme-122	1	CT+BCC	240	231	9	30
Dosso- Guecheme-123	1	CT+BCC	228	192	36	30
Dosso- Guecheme-124	1	CT+BCC	192	191	1	30
Dosso- Guecheme-125	1	CT+BCC	184	171	13	30
Dosso- Guecheme-126	1	CT	208	195	13	30
Dosso- Guecheme-127	1	CT+BCC	377	374	3	30
Dosso- Guecheme-128	1	CT+BCC	34	34	0	26
Dosso- Guecheme-129	1	CT	23	23	0	13
Dosso- Guecheme-130	1	CT+BCC	76	76	0	27
Dosso- Guecheme-131	1	CT	48	44	4	21
Dosso- Guecheme-132	2	Control	93	93	0	30
Dosso- Guecheme-133	1	Control	165	165	0	30
Dosso- Guecheme-135	1	Control	259	255	4	30
Dosso- Guecheme-136	1	Control	211	197	14	30
Dosso- Guecheme-137	1	Control	371	327	44	30
Dosso- Guecheme-138	1	Control	352	325	27	30
Dosso- Guecheme-139	1	Control	458	456	2	30
Dosso- Guecheme-140	1	Control	58	58	0	22
Dosso- Guecheme-141	1	Control	38	38	0	20
Dosso- Tibiri-142	1	CT+BCC	270	238	32	30
Dosso- Tibiri-143	1	CT	187	94	93	30
Dosso- Tibiri-144	1	CT+BCC	277	139	138	27
Dosso- Tibiri-145	1	CT+BCC	414	212	202	30
Dosso- Tibiri-146	1	CT	144	112	32	23
Dosso- Tibiri-147	1	CT+BCC	339	253	86	30
Dosso- Tibiri-148	1	CT	122	61	61	28
Dosso- Tibiri-149	1	CT	203	182	21	25
Dosso- Tibiri-150	1	CT+BCC	124	117	7	30
Dosso- Tibiri-151	1	CT	108	54	54	30
Dosso- Tibiri-152	1	CT+BCC	147	93	54	30
Dosso- Tibiri-153	1	CT+BCC	139	87	52	29
Dosso- Tibiri-154	1	CT	237	158	79	27
Dosso- Tibiri-155	1	CT	214	199	15	30
Dosso- Tibiri-156	1	CT+BCC	54	52	2	27
Dosso- Tibiri-157	1	Control	273	137	136	30
Dosso- Tibiri-158	1	Control	144	121	23	30
Dosso- Tibiri-159	1	Control	445	223	222	29
Dosso- Tibiri-160	1	Control	132	106	26	30
Dosso- Tibiri-161	1	Control	111	56	55	24
Dosso- Tibiri-162	2	Control	113	82	31	28
Dosso- Tibiri-163	1	Control	144	72	72	30
Dosso- Tibiri-164	1	Control	39	39	0	26

**Table S1 (continued): Households per cluster in listing and baseline sample**

Maradi- Tchadoua-1	2	CT+BCC	185	182	3	30
Maradi- Tchadoua-2	1	CT	193	186	7	30
Maradi- Tchadoua-3	2	CT	171	116	55	30
Maradi- Tchadoua-4	1	CT	702	683	19	29
Maradi- Tchadoua-5	1	CT	188	107	81	30
Maradi- Tchadoua-6	1	CT	147	147	0	30
Maradi- Tchadoua-7	2	CT+BCC	99	99	0	30
Maradi- Tchadoua-8	2	CT+BCC	128	126	2	30
Maradi- Tchadoua-9	2	CT+BCC	127	64	63	29
Maradi- Tchadoua-10	1	CT+BCC	100	98	2	30
Maradi- Tchadoua-11	2	CT	164	161	3	30
Maradi- Tchadoua-12	2	CT+BCC	204	133	71	30
Maradi- Tchadoua-13	2	CT+BCC	185	181	4	29
Maradi- Tchadoua-14	2	CT	95	95	0	30
Maradi- Tchadoua-15	1	CT+BCC	22	22	0	0
Maradi- Tchadoua-16	2	CT	48	37	11	26
Maradi- Tchadoua-17	1	CT+BCC	131	130	1	30
Maradi- Tchadoua-18	1	Control	376	188	188	30
Maradi- Tchadoua-19	2	Control	229	229	0	30
Maradi- Tchadoua-20	1	Control	113	60	53	30
Maradi- Tchadoua-21	1	Control	291	146	145	30
Maradi- Tchadoua-22	2	Control	81	72	9	30
Maradi- Tchadoua-23	1	Control	116	102	14	30
Maradi- Tchadoua-24	1	Control	334	315	19	30
Maradi- Tchadoua-25	3	Control	126	126	0	30
Maradi- Tchadoua-26	1	Control	144	144	0	6
Maradi- Gangara-27	3	CT+BCC	283	276	7	30
Maradi- Gangara-28	1	CT+BCC	299	274	25	30
Maradi- Gangara-29	1	CT	131	130	1	30
Maradi- Gangara-30	1	CT	148	74	74	30
Maradi- Gangara-31	1	CT+BCC	293	293	0	30
Maradi- Gangara-32	1	CT	155	145	10	30
Maradi- Gangara-33	1	CT+BCC	156	109	47	30
Maradi- Gangara-34	1	CT	131	66	65	30
Maradi- Gangara-35	1	CT	166	162	4	24
Maradi- Gangara-36	1	Control	170	117	53	30
Maradi- Gangara-37	1	Control	134	134	0	30
Maradi- Gangara-38	1	Control	151	136	15	28
Maradi- Gangara-39	1	Control	128	64	64	29
Maradi- Gangara-40	2	Control	144	115	29	30
Maradi- Guidan Sorry-41	1	CT+BCC	66	65	1	30
Maradi- Guidan Sorry-42	2	CT	258	256	2	30
Maradi- Guidan Sorry-43	1	CT+BCC	138	138	0	30
Maradi- Guidan Sorry-44	2	CT+BCC	223	202	21	30
Maradi- Guidan Sorry-45	1	CT+BCC	251	251	0	30
Maradi- Guidan Sorry-46	1	CT	384	334	50	30
Maradi- Guidan Sorry-47	2	CT	650	629	21	30
Maradi- Guidan Sorry-48	1	CT	148	146	2	30
Maradi- Guidan Sorry-49	1	CT+BCC	130	121	9	30
Maradi- Guidan Sorry-50	3	CT+BCC	198	197	1	30
Maradi- Guidan Sorry-51	2	CT	201	201	0	30
Maradi- Guidan Sorry-52	1	CT+BCC	97	90	7	30
Maradi- Guidan Sorry-53	1	CT+BCC	209	203	6	30
Maradi- Guidan Sorry-54	1	CT	239	235	4	30
Maradi- Guidan Sorry-55	2	CT	269	255	14	16
Maradi- Guidan Sorry-56	3	CT	194	191	3	30
Maradi- Guidan Sorry-57	3	CT	162	135	27	25
Maradi- Guidan Sorry-58	4	CT+BCC	144	140	4	26
Maradi- Guidan Sorry-59	1	Control	357	318	39	30
Maradi- Guidan Sorry-60	2	Control	144	143	1	30
Maradi- Guidan Sorry-61	3	Control	190	180	10	30
Maradi- Guidan Sorry-62	1	Control	259	248	11	30
Maradi- Guidan Sorry-63	4	Control	222	217	5	30
Maradi- Guidan Sorry-64	2	Control	214	147	67	30
Maradi- Guidan Sorry-65	1	Control	61	60	1	30
Maradi- Guidan Sorry-66	2	Control	124	117	7	30
Maradi- Guidan Sorry-100	1	Control	30	28	2	20

**Table S1 (continued): Households per cluster in listing and baseline sample**

Maradi- Sae Saboua-68	1	CT+BCC	156	156	0	30
Maradi- Sae Saboua-69	1	CT	117	91	26	30
Maradi- Sae Saboua-70	2	CT	97	83	14	30
Maradi- Sae Saboua-71	1	CT+BCC	140	123	17	30
Maradi- Sae Saboua-72	1	CT+BCC	92	46	46	30
Maradi- Sae Saboua-73	1	CT	77	75	2	30
Maradi- Sae Saboua-74	1	CT	101	98	3	30
Maradi- Sae Saboua-75	1	CT	97	72	25	30
Maradi- Sae Saboua-76	2	CT	60	55	5	30
Maradi- Sae Saboua-77	1	CT+BCC	293	189	104	30
Maradi- Sae Saboua-78	1	CT	152	126	26	30
Maradi- Sae Saboua-79	1	CT	185	174	11	30
Maradi- Sae Saboua-80	2	CT+BCC	213	212	1	30
Maradi- Sae Saboua-81	2	CT	89	53	36	30
Maradi- Sae Saboua-82	1	CT	144	116	28	30
Maradi- Sae Saboua-83	2	CT+BCC	182	181	1	30
Maradi- Sae Saboua-84	2	CT+BCC	87	87	0	30
Maradi- Sae Saboua-85	1	CT+BCC	170	162	8	30
Maradi- Sae Saboua-86	3	CT+BCC	199	123	76	30
Maradi- Sae Saboua-87	1	CT+BCC	30	29	1	21
Maradi- Sae Saboua-88	1	CT	25	24	1	23
Maradi- Sae Saboua-89	1	Control	89	53	36	30
Maradi- Sae Saboua-90	1	Control	62	53	9	30
Maradi- Sae Saboua-91	2	Control	170	85	85	30
Maradi- Sae Saboua-92	2	Control	83	81	2	30
Maradi- Sae Saboua-93	2	Control	101	94	7	30
Maradi- Sae Saboua-94	2	Control	221	190	31	30
Maradi- Sae Saboua-95	1	Control	91	50	41	30
Maradi- Sae Saboua-96	1	Control	60	57	3	30
Maradi- Sae Saboua-97	2	Control	80	79	1	30
Maradi- Sae Saboua-98	1	Control	124	82	42	30
Maradi- Sae Saboua-99	1	Control	13	7	6	7
<b>Total</b>	<b>215</b>		<b>26842</b>	<b>22972</b>	<b>3870</b>	<b>4330</b>

Table S2: Households per cluster in baseline and follow-up sample

	Households at baseline			Households at baseline and follow-up						
	Total	Actual Beneficiaries	Actual non-beneficiaries	Total	Actual Beneficiaries	Actual non-beneficiaries	Predicted Beneficiaries	Treatment	Share of actual beneficiaries	Share of predicted beneficiaries
Region - Commune - Cluster										
Dosso-Guechemé-101	30	0	30	21	0	21	7	Control	0%	33%
Dosso-Guechemé-102	30	8	22	26	8	18	14	CT	31%	54%
Dosso-Guechemé-112	30	12	18	28	12	16	12	CT	43%	43%
Dosso-Guechemé-114	30	13	17	27	13	14	15	CT	48%	56%
Dosso-Guechemé-115	30	18	12	27	17	10	14	CT	63%	52%
Dosso-Guechemé-116	30	14	16	27	14	13	13	CT	52%	48%
Dosso-Guechemé-117	30	11	19	28	11	17	11	CT	39%	39%
Dosso-Guechemé-118	30	8	22	27	8	19	15	CT	30%	56%
Dosso-Guechemé-119	30	5	25	22	4	18	3	CT+BCC	18%	14%
Dosso-Guechemé-120	30	16	14	28	16	12	16	CT+BCC	57%	57%
Dosso-Guechemé-121	30	10	20	29	10	19	15	CT+BCC	34%	52%
Dosso-Guechemé-122	30	17	13	28	17	11	18	CT+BCC	61%	64%
Dosso-Guechemé-123	30	10	20	25	10	15	11	CT+BCC	40%	44%
Dosso-Guechemé-124	30	9	21	28	8	20	16	CT+BCC	29%	57%
Dosso-Guechemé-125	30	7	23	21	7	14	10	CT+BCC	33%	48%
Dosso-Guechemé-126	30	10	20	27	10	17	15	CT	37%	56%
Dosso-Guechemé-127	30	7	23	26	7	19	8	CT+BCC	27%	31%
Dosso-Guechemé-128	26	6	20	23	6	17	6	CT+BCC	26%	26%
Dosso-Guechemé-129	13	6	7	13	6	7	4	CT	46%	31%
Dosso-Guechemé-130	27	10	17	20	8	12	8	CT+BCC	40%	40%
Dosso-Guechemé-131	21	8	13	15	6	9	5	CT	40%	33%
Dosso-Guechemé-132	30	0	30	27	0	27	15	Control	0%	56%
Dosso-Guechemé-133	30	0	30	25	0	25	13	Control	0%	52%
Dosso-Guechemé-135	30	0	30	25	0	25	6	Control	0%	24%
Dosso-Guechemé-136	30	0	30	26	0	26	10	Control	0%	38%
Dosso-Guechemé-137	30	0	30	23	0	23	10	Control	0%	43%
Dosso-Guechemé-138	30	0	30	24	0	24	13	Control	0%	54%
Dosso-Guechemé-139	30	0	30	28	0	28	7	Control	0%	25%
Dosso-Guechemé-140	22	0	22	19	0	19	11	Control	0%	58%
Dosso-Guechemé-141	20	0	20	9	0	9	3	Control	0%	33%
Dosso-Tibiri-142	30	12	18	28	12	16	18	CT+BCC	43%	64%
Dosso-Tibiri-143	30	10	20	29	10	19	17	CT	34%	59%
Dosso-Tibiri-144	27	7	20	22	6	16	17	CT+BCC	27%	77%
Dosso-Tibiri-145	30	12	18	27	12	15	18	CT+BCC	44%	67%
Dosso-Tibiri-146	23	11	12	23	11	12	11	CT	48%	48%
Dosso-Tibiri-147	30	14	16	27	14	13	16	CT+BCC	52%	59%
Dosso-Tibiri-148	28	4	24	26	4	22	13	CT	15%	50%
Dosso-Tibiri-149	25	4	21	22	4	18	5	CT	18%	23%
Dosso-Tibiri-150	30	15	15	28	15	13	18	CT+BCC	54%	64%
Dosso-Tibiri-151	30	9	21	26	9	17	21	CT	35%	81%
Dosso-Tibiri-152	30	16	14	26	16	10	10	CT+BCC	62%	38%
Dosso-Tibiri-153	29	14	15	25	13	12	16	CT+BCC	52%	64%
Dosso-Tibiri-154	27	3	24	24	2	22	10	CT	8%	42%
Dosso-Tibiri-155	30	12	18	27	12	15	9	CT	44%	33%
Dosso-Tibiri-156	27	5	22	24	5	19	8	CT+BCC	21%	33%
Dosso-Tibiri-157	30	0	30	27	0	27	14	Control	0%	52%
Dosso-Tibiri-158	30	0	30	28	0	28	9	Control	0%	32%
Dosso-Tibiri-159	29	0	29	26	0	26	8	Control	0%	31%
Dosso-Tibiri-160	30	0	30	24	0	24	9	Control	0%	38%
Dosso-Tibiri-161	24	0	24	18	0	18	6	Control	0%	33%
Dosso-Tibiri-162	28	0	28	26	0	26	9	Control	0%	35%
Dosso-Tibiri-163	30	0	30	26	0	26	5	Control	0%	19%
Dosso-Tibiri-164	26	0	26	25	0	25	14	Control	0%	56%
Maradi-Tchadoua-1	30	10	20	19	10	9	0	CT+BCC	53%	0%
Maradi-Tchadoua-2	30	9	21	28	9	19	13	CT	32%	46%
Maradi-Tchadoua-3	30	17	13	28	16	12	16	CT	57%	57%
Maradi-Tchadoua-4	29	12	17	23	9	14	12	CT	39%	52%
Maradi-Tchadoua-5	30	7	23	22	6	16	8	CT	27%	36%
Maradi-Tchadoua-6	30	11	19	26	11	15	10	CT	42%	38%
Maradi-Tchadoua-7	30	13	17	27	12	15	10	CT+BCC	44%	37%
Maradi-Tchadoua-8	30	11	19	27	11	16	11	CT+BCC	41%	41%
Maradi-Tchadoua-9	29	15	14	29	15	14	11	CT+BCC	52%	38%
Maradi-Tchadoua-10	30	10	20	28	10	18	16	CT+BCC	36%	57%
Maradi-Tchadoua-11	30	16	14	25	13	12	12	CT	52%	48%
Maradi-Tchadoua-12	30	16	14	27	16	11	9	CT+BCC	59%	33%
Maradi-Tchadoua-13	29	17	12	29	17	12	19	CT+BCC	59%	66%
Maradi-Tchadoua-14	30	9	21	28	9	19	9	CT	32%	32%
Maradi-Tchadoua-16	26	12	14	26	12	14	12	CT	46%	46%
Maradi-Tchadoua-17	30	15	15	25	15	10	12	CT+BCC	60%	48%
Maradi-Tchadoua-18	30	0	30	24	0	24	12	Control	0%	50%
Maradi-Tchadoua-19	30	0	30	24	0	24	4	Control	0%	17%
Maradi-Tchadoua-20	30	0	30	29	0	29	15	Control	0%	52%
Maradi-Tchadoua-21	30	0	30	23	0	23	11	Control	0%	48%
Maradi-Tchadoua-22	30	0	30	28	0	28	11	Control	0%	39%
Maradi-Tchadoua-23	30	0	30	27	0	27	14	Control	0%	52%
Maradi-Tchadoua-24	30	0	30	26	0	26	12	Control	0%	46%
Maradi-Tchadoua-25	30	0	30	24	0	24	8	Control	0%	33%
Maradi-Tchadoua-26	6	0	6	5	0	5	2	Control	0%	40%

Table S2 (continued): Households per cluster in baseline and follow-up sample										
Maradi-Gangara-27	30	9	21	28	9	19	5	CT+BCC	32%	18%
Maradi-Gangara-28	30	8	22	26	8	18	7	CT+BCC	31%	27%
Maradi-Gangara-29	30	15	15	26	15	11	12	CT	58%	46%
Maradi-Gangara-30	30	15	15	28	15	13	15	CT	54%	54%
Maradi-Gangara-31	30	15	15	28	15	13	8	CT+BCC	54%	29%
Maradi-Gangara-32	30	8	22	27	8	19	12	CT	30%	44%
Maradi-Gangara-33	30	16	14	25	14	11	10	CT+BCC	56%	40%
Maradi-Gangara-34	30	13	17	27	12	15	12	CT	44%	44%
Maradi-Gangara-35	24	10	14	21	9	12	11	CT	43%	52%
Maradi-Gangara-36	30	0	30	26	0	26	5	Control	0%	19%
Maradi-Gangara-37	30	0	30	27	0	27	22	Control	0%	81%
Maradi-Gangara-38	28	0	28	27	0	27	14	Control	0%	52%
Maradi-Gangara-39	29	0	29	27	0	27	12	Control	0%	44%
Maradi-Gangara-40	30	0	30	29	0	29	15	Control	0%	52%
Maradi-Guidan Sorry-41	30	17	13	29	16	13	18	CT+BCC	55%	62%
Maradi-Guidan Sorry-42	30	11	19	27	11	16	5	CT	41%	19%
Maradi-Guidan Sorry-43	30	13	17	29	13	16	17	CT+BCC	45%	59%
Maradi-Guidan Sorry-44	30	15	15	28	15	13	14	CT+BCC	54%	50%
Maradi-Guidan Sorry-45	30	16	14	28	15	13	15	CT+BCC	54%	54%
Maradi-Guidan Sorry-46	30	9	21	24	9	15	6	CT	38%	25%
Maradi-Guidan Sorry-47	30	9	21	23	8	15	8	CT	35%	35%
Maradi-Guidan Sorry-48	30	11	19	26	11	15	13	CT	42%	50%
Maradi-Guidan Sorry-49	30	9	21	28	9	19	14	CT+BCC	32%	50%
Maradi-Guidan Sorry-50	30	14	16	27	14	13	12	CT+BCC	52%	44%
Maradi-Guidan Sorry-51	30	15	15	28	15	13	12	CT	54%	43%
Maradi-Guidan Sorry-52	30	11	19	29	11	18	9	CT+BCC	38%	31%
Maradi-Guidan Sorry-53	30	10	20	27	10	17	14	CT+BCC	37%	52%
Maradi-Guidan Sorry-54	30	11	19	27	11	16	15	CT	41%	56%
Maradi-Guidan Sorry-55	16	6	10	15	6	9	1	CT	40%	7%
Maradi-Guidan Sorry-56	30	17	13	25	16	9	12	CT	64%	48%
Maradi-Guidan Sorry-57	25	7	18	21	7	14	1	CT	33%	5%
Maradi-Guidan Sorry-58	26	2	24	22	2	20	4	CT+BCC	9%	18%
Maradi-Guidan Sorry-59	30	0	30	26	0	26	10	Control	0%	38%
Maradi-Guidan Sorry-60	30	0	30	28	0	28	14	Control	0%	50%
Maradi-Guidan Sorry-61	30	0	30	26	0	26	15	Control	0%	58%
Maradi-Guidan Sorry-62	30	0	30	27	0	27	13	Control	0%	48%
Maradi-Guidan Sorry-63	30	0	30	28	0	28	17	Control	0%	61%
Maradi-Guidan Sorry-64	30	0	30	28	0	28	20	Control	0%	71%
Maradi-Guidan Sorry-65	30	0	30	27	0	27	13	Control	0%	48%
Maradi-Guidan Sorry-66	30	0	30	28	0	28	10	Control	0%	36%
Maradi-Guidan Sorry-100	20	0	20	12	0	12	3	Control	0%	25%
Maradi-Sae Saboua-68	30	5	25	26	5	21	10	CT+BCC	19%	38%
Maradi-Sae Saboua-69	30	14	16	28	14	14	17	CT	50%	61%
Maradi-Sae Saboua-70	30	15	15	29	15	14	12	CT	52%	41%
Maradi-Sae Saboua-71	30	17	13	27	17	10	11	CT+BCC	63%	41%
Maradi-Sae Saboua-72	30	9	21	27	9	18	10	CT+BCC	33%	37%
Maradi-Sae Saboua-73	30	17	13	29	17	12	16	CT	59%	55%
Maradi-Sae Saboua-74	30	17	13	28	17	11	12	CT	61%	43%
Maradi-Sae Saboua-75	30	14	16	30	14	16	17	CT	47%	57%
Maradi-Sae Saboua-76	30	13	17	27	13	14	14	CT	48%	52%
Maradi-Sae Saboua-77	30	2	28	21	2	19	6	CT+BCC	10%	29%
Maradi-Sae Saboua-78	30	7	23	27	7	20	6	CT	26%	22%
Maradi-Sae Saboua-79	30	15	15	28	14	14	9	CT	50%	32%
Maradi-Sae Saboua-80	30	12	18	24	11	13	6	CT+BCC	46%	25%
Maradi-Sae Saboua-81	30	17	13	28	17	11	15	CT	61%	54%
Maradi-Sae Saboua-82	30	10	20	25	10	15	14	CT	40%	56%
Maradi-Sae Saboua-83	30	13	17	28	13	15	6	CT+BCC	46%	21%
Maradi-Sae Saboua-84	30	15	15	27	14	13	13	CT+BCC	52%	48%
Maradi-Sae Saboua-85	30	15	15	26	15	11	14	CT+BCC	58%	54%
Maradi-Sae Saboua-86	30	15	15	28	15	13	10	CT+BCC	54%	36%
Maradi-Sae Saboua-87	21	13	8	18	13	5	5	CT+BCC	72%	28%
Maradi-Sae Saboua-88	23	8	15	19	8	11	4	CT	42%	21%
Maradi-Sae Saboua-89	30	0	30	25	0	25	11	Control	0%	44%
Maradi-Sae Saboua-90	30	0	30	23	0	23	8	Control	0%	35%
Maradi-Sae Saboua-91	30	0	30	25	0	25	11	Control	0%	44%
Maradi-Sae Saboua-92	30	0	30	24	0	24	15	Control	0%	63%
Maradi-Sae Saboua-93	30	0	30	30	0	30	13	Control	0%	43%
Maradi-Sae Saboua-94	30	0	30	28	0	28	13	Control	0%	46%
Maradi-Sae Saboua-95	30	0	30	25	0	25	13	Control	0%	52%
Maradi-Sae Saboua-96	30	0	30	25	0	25	11	Control	0%	44%
Maradi-Sae Saboua-97	30	0	30	25	0	25	8	Control	0%	32%
Maradi-Sae Saboua-98	30	0	30	28	0	28	13	Control	0%	46%
Maradi-Sae Saboua-99	7	0	7	5	0	5	3	Control	0%	60%
Total	4,330	1,128	3,202	3,811	1,098	2,713	1,685			
Total Treatment	2,861	1,128	1,733	2,545	1,098	1,447	1,125		43%	44%

Note: Two nomadic clusters (one control and one treatment cluster, including 6 villages in total) were originally drawn into the evaluation sample but had to be dropped from the baseline survey due to communities being entirely inaccessible. One of the two clusters could be added back into the sample at follow-up as part of the additional booster sample. It is not included in this table.