

## CA☆ FORUM ON PUBLIC ANTHROPOLOGY

# Conditional Cash Transfers, Food Security, and Health

## Biocultural Insights for Poverty-Alleviation Policy from the Brazilian Amazon

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Conditional cash transfer (CCT) programs have become an increasingly popular component of poverty-alleviation policies worldwide. The highly publicized success of Brazil's Bolsa Família program (BFP), the largest such program in the world, has become a model for CCT programs elsewhere, including in highly rural African nations. This is despite the dearth of information on the impact of the program in rural contexts. Drawing on a unique natural experiment and using detailed anthropometric and dietary data collected in rural Amazonian subsistence-based communities, we analyze the impact of this critical policy on programmatic goals among the rural poor. Our data demonstrate the urgent need for more fine-grained biocultural research on this and similar policies. We show that despite close adherence to programmatic conditionalities, recipient households' food security was measurably worse off and children's poor nutritional status was virtually unchanged 4 years into the program. Using detailed ethnographic insights, we discuss the mechanisms that may explain these disappointing results in this rural zone and raise broader questions about the role of CCT programs for breaking the cycle of poverty in subsistence-based communities worldwide, especially without concomitant investment in public health and sanitation infrastructure.

Conditional cash transfer (CCT) programs are now established as one of the most popular antipoverty policies worldwide (Amaral and Monteiro 2013; Hall 2006). These programs use direct cash payments to allow the very poor to meet their most pressing needs (i.e., food, medicine), while the "conditionalities" incentivize investments in children's health and education through monitored school attendance and medical care, including vaccination and nutritional monitoring. With children as their primary target, CCT programs thus integrate a monetary approach to poverty reduction with a capabilities approach to meet short- and long-term goals, respectively. That is, they are designed to reduce children's hunger and destitution in

the short term while building specific forms of human capital in children that are intended to eventually position them to better compete in the labor market, earn higher incomes relative to their parents', and therefore break the intergenerational cycle of poverty (Riddell 2004; Soares, Ribas, and Osório 2010).

Mexico pioneered the CCT approach in 1997 (Kakwani, Soares, and Son 2005), and it was soon after taken up by other Latin American countries (Handa and Davis 2006; Saad-Filho 2015). After merging a variety of existing cash transfer programs,<sup>1</sup> Brazil launched the Bolsa Família program (BFP) in 2003; it is now the world's largest CCT, with about 45 million direct beneficiaries (Cabral et al. 2014; de Brauw et al. 2014). The Latin American experience has since inspired CCT programing in Sub-Saharan Africa and across the global South (Saad-Filho 2015).

CCT programs are popular because they are often politically expedient: a cost-effective means for governments to directly address poverty alleviation without altering the political-economic status quo (Hall 2008; Saad-Filho 2015).<sup>2</sup> Indeed, CCT programs were developed as an ideologically palatable

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1. Bolsa Família consolidated four former, separate programs: Bolsa Escola, Bolsa Alimentação, Auxílio Gas, and Cartão Alimentação.

2. Bolsa Família costs 0.5% of gross domestic product (Hall 2006).

solution to the acute destitution that accompanied neoliberal development strategies, which rolled back social protections and increased employment precarity and economic informality across Latin America (Saad-Filho 2015).

Even critics of CCT programs, however, acknowledge that their popularity also rests on their ability to generate positive results (Marshall and Hill 2014). For example, in both Mexico and Brazil, CCT programs have led to improvements in school attendance and in the uptake of health care services for children (Gertler 2004; Hoddinott, Skoufias, and Washburn 2000; Reis 2010). In both countries, researchers found increased consumption rates among recipient households and corresponding increases in reported food security<sup>3</sup> (de Bem Lignani et al. 2010; Gertler 2004; Hoddinott, Skoufias, and Washburn 2000). In Brazil, some studies have linked improved food security in BFP-receiving households to improvements in child growth (Paes-Sousa, Pacheco-Santos, and Shisue-Miazaki 2011); other studies have found that BFP enrollment reduced rates of child mortality (Guanais 2013; Rasella et al. 2013).

Macroeconomic impacts of CCT programs are particularly impressive: both Mexico's and Brazil's CCTs raised incomes enough to depress income inequality nationwide, with a remarkable 15% decline in Brazil's infamous GINI coefficient (Sánchez-Ancochea and Mattei 2011; Soares, Ribas, and Osório 2010; Wetzel 2013). As a result of these successes, Brazil's CCT program has been especially lauded in policy circles (Lindert et al. 2007; see also Saad-Filho 2015), and its tenth anniversary renewed focus on CCT programs worldwide—those under way and those planned (Adato and Hoddinott 2010; Garcia and Moore 2012; Lagarde, Haines, and Palmer 2007; Marshall and Hill 2014).

But Bolsa Família's successes and the policy momentum it has inspired make it easy to overlook the significant empirical gaps that remain in our basic understanding of where and why the BFP works—or does not (Amaral and Monteiro 2013; Marshall and Hill 2014; Martins et al. 2013). Three empirical lacuna stand out—each interrelated and all raising important policy questions about how, why, where, and whether CCT programs are implemented within and beyond Brazil.

#### *How Does BFP Impact Actual and Perceived Food Security?*

Like most CCTs, the central preoccupation of the BFP has been to end childhood hunger.<sup>4</sup> Ending hunger—and building food security more broadly—is a vital precondition for other forms of human capital development, because well-nourished

3. Food security is defined as a situation where “all people, at all times, have physical and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life” (FAO 2009:6).

4. In his inaugural speech, Lula, the president in office at the time the Bolsa Família program was initiated, was quoted as saying, “If, by the end of my term in office, every Brazilian has food to eat three times a day, I shall have fulfilled my mission in life” (Hall 2006).

children not only are more resistant to disease but also are better able to learn: “investments in [children's] nutrition make investments in schooling more productive” (Hoddinott 2010: 231). Maternal health is an important part of this equation, as a mother's health, in part via epigenetic mechanisms, influences that of her child (Kuzawa 2005). In addition, mothers can better realize their essential caregiving and reporting role (as required under BFP) when they have better physical and mental health—both of which are shown to improve when women are no longer chronically stressed about how to put food on the table and feel more food secure generally (Weaver and Hadley 2009). Thus, it would seem that one of the most direct ways to measure the BFP's short-term effectiveness and to best predict its long-term success in breaking the intergenerational cycle of poverty would be to verify that it is, in fact, increasing households' actual and perceived food security. While food security status can be assessed using different measures (Pinstrup-Anderson 2009), we argue that direct measures of maternal and child dietary adequacy, child growth, and mothers' views about access to food are most salient for evaluating the efficacy of the BFP.

Surprisingly, however, few assessments have used direct (vs. reported) observations of consumption, or before/after anthropometric measurements to assess the program's impact on the actual and perceived food security of mothers and children. Studies with direct measures show mixed results (e.g., cf. Paes-Sousa, Pacheco-Santos, and Shisue-Miazaki 2011; Saldiva, Silva, and Saldiva 2010; Soares, Ribas, and Osório 2010). These findings raise serious questions about where and how BFP actually improves the nutritional status of children and their mothers while lessening women's worries about food and, therefore, its potential to meet its stated short- and long-term goals.

#### *What Impacts Does BFP Have in Rural Areas?*

To date, evaluations of the BFP show a pronounced urban and peri-urban bias. This is perhaps because 85% of the Brazilian population is considered urban (IBGE 2010). But in Brazil, as elsewhere, it is in rural areas that hunger and malnutrition are concentrated (CEDEPLAR 2007; Smith, El Obeid, and Jensen 2000) and thus where poverty-alleviation programs are arguably most needed. Unfortunately, because BFP assessment data are aggregated at the municipal level—the scale at which the BFP is administered (Rasella et al. 2013)—they blend data on rural and urban populations. As a result, widespread reports of BFP's success in the putatively rural northeast (see, e.g., de Bem Lignani et al. 2010) in fact reflect largely urban and peri-urban dynamics. This “ecological fallacy”<sup>5</sup> means that remarkably little is known about BFP's impacts in rural areas. Information is particularly lacking within the Amazon region

5. Here we use the term “ecological fallacy” to refer to the statistical fallacy in which attributes of an aggregated population are assumed to hold across the subpopulations that comprise it.

of northern Brazil, where municipalities post the country's lowest Human Development Index (HDI)<sup>6</sup> scores (IBGE 2010) and highest rates of chronic (19.2%) and acute (7.2%) malnutrition (Jaime et al. 2014). To our knowledge, there has been no systematic evaluation of BFP impacts in this region—perhaps reflecting the long-standing invisibility of the Amazon's rural poor (see Adams, Murrieta, and Neves 2009; Nugent 1993; Silva 2009). The absence of information on this population's experience with Bolsa Família means that conclusions regarding Brazil's national CCT success are at best partial and premature. A better understanding of these dynamics would appear particularly important given that BFP-inspired programs are being directed at multiple new rural regions beyond Latin America—where many target populations are more analogous to subsistence-based Amazonian populations than Brazil's urban poor (Miller, Tsoka, and Reichert 2011; Schubert and Slater 2006).

#### *How Do BFP Payments Lead to Specific Outcomes?*

A final empirical gap relates to the mechanisms through which CCT programs produce particular outcomes, whether positive or disappointing (Adato and Hoddinott 2010; Barrientos 2012; de Souza-Lago and Dallman 2012). To date, most assessments of CCTs rely on large-scale panel econometric surveys, which offer little opportunity to assess the behavioral changes that cash transfers inspire over time (see, e.g., Reis 2010). This makes it difficult to know, for example, how Bolsa Família changes the aspirations and abilities of rural children as they develop forms of human capital (e.g., through formal education) that may be best suited to cash-based urban labor markets rather than to cash-scarce rural economies dominated by smallholder agriculture and natural resource extraction. This is a particularly salient issue in the Amazon, where the resilience of rural livelihoods has historically been rooted in labor mobility and flexibility under boom/bust economic conditions (Vogt et al. 2015). How the conditionalities of the BFP impact rural children's life prospects therefore remains an open question—one that is best explored through grounded, longitudinal, and immersive observation.

These shortcomings in BFP assessment and monitoring would be remedied by greater involvement by anthropologists. This paper aspires to demonstrate how biocultural insights, gained through ethnographically grounded human biology research, can be used to redress these gaps and shed fresh light on the BFP and allied programs globally. Specifically, we report on a natural experiment, a before/after case study, that addresses all three of these understudied aspects of CCT programming in Brazil. This work results from the first author's long-term research among subsistence-based households in Brazil's eastern Amazonian state of Pará, beginning in 2002–

6. Human Development Index (HDI) is a composite index of life expectancy, income, and education that is used to rank countries based on level of development.

2004 and spanning a period punctuated by the arrival of the Bolsa Família program. Our results qualify standard narratives about Bolsa Família's widespread success and raise important questions about the design, implementation, and evaluation of poverty-alleviation programs globally. We conclude with a provocation to anthropologists to participate more directly in the critical evaluation of the putatively “pro-poor” programs currently impacting millions of the world's most vulnerable.

#### *Research Setting before and after Bolsa Família*

The data presented here were collected in seven rural communities (total population approximately 1,200) in the municipalities of Portel (population 52,172) and Melgaço (population 24,808; IBGE 2010). Poverty rates in these municipalities are extremely high: based on the HDI, they rank among the twelfth lowest among all of Brazil's 5,565 municipalities (PNUD 2013). People in the study communities identify as *ribeirinhos*; this mixed ethnic group (Indigenous Amazonian/European/African) emerged during the colonization of the Amazon and now dominates the basin demographically.

It takes ~8 hours by diesel-powered boat from either municipal seat to reach the communities. Within communities, households are widely spaced in a pattern typical of the region (Eloy, Brondizio, and do Pateo 2015). All communities are located along nutrient-poor, black-water rivers in a mixed *várzea/terra firme* environment. Land available for subsistence-based agriculture is relatively unrestricted in that population density is low and state authorities permit households to clear fields for staple crop production; the primary constraint on food production is labor. The dietary staple, bitter manioc (*Manihot esculenta* Cranz), is consumed as *farinha*, a toasted meal, and complemented by fish and hunted game, the primary sources of protein in the diet (Piperata and Dufour 2007). Wild but managed *açaí* (*Euterpe oleracea*) was the only calorically significant forest fruit in local diets. While the region experiences wet and dry seasons, there appears to be little seasonal variation in energy intake and macronutrient composition (see also Murrieta et al. 2008; Piperata and Dufour 2007).

#### *Before Bolsa Família*

In 2002, average household size was nine, and most male and female household heads had spent their lives in the region. Monthly cash income averaged ~US\$130, with much inter-household variation ( $\pm$  US\$126); almost all fell well within the BFP's most-needy category of “extremely poor.” Approximately 40% of households reported some income from wage labor for at least 4 months of the year (Piperata 2007). For some households, access to cash was seasonal, especially for the 25% that sold *açaí* (see also Brondizio 2008). Due to their distance from the city, *regatões* (boat merchants) mediated much of the rural-urban economic connections, whereby locals bartered *farinha* and *açaí* for nonlocal products (e.g., sugar, coffee, cooking oil,

salt, soap, motor oil, fishing and hunting supplies). Residents often complained about the high prices charged by the *regatão*, which commonly led to long-term indebtedness.

All seven communities had a small open-air schoolhouse with limited materials (i.e., books, chalkboard, etc.). Classes were taught by teachers from the communities who often had limited training. Schools offered up to four years of education; most adults reported having fewer than 3 years of formal schooling.

Rates of stunting (height for age  $Z$  score  $< -2.0$ ) among adults and children were high (~50%), but rates of wasting (weight for height  $Z$  score  $< -2.0$ ) were low (Piperata 2007), indicating that chronic malnutrition was affecting child development. The fertility rate was high; completed fertility (for women  $\geq 45$  years) was estimated at 10.2 in 2002. Infants were not born small but showed a steady decline in stature with weaning (Piperata 2007). While all children were breastfed, supplementary foods (e.g., sugar-sweetened teas, fruits, gruels made from manioc, corn, or rice starch) were commonly given within the first 3 months. Average age at weaning was 18 months.

In 2002, only one community had a generator, which was occasionally used to power lights and four TV sets for a few hours in the evening. No household had running water. About 39% derived water from wells, and the remainder relied on the river. Twenty-nine percent had pit toilets; others relied on open defecation. These conditions likely contribute to the high rates of parasitic and gastrointestinal infection found in the region (Silva 2009)—factors that are closely linked to children's poor growth (Hoddinott 2010).

While the communities are far from urban centers, as elsewhere in Amazonia, the constant circulation of people, goods, and ideas between rural and urban spaces means that livelihoods are best described as “multisited” (Dufour and Piperata 2004; Hecht 2014; Nasuti et al. 2015; Padoch et al. 2008). Even prior to BFP, these rural-urban circulations appeared to be intensifying across Amazonia, in part due to public policies that required rural residents to pick up cash transfers in cities (Eloy, Brondizio, and do Pateo 2015; Padoch et al. 2008). For example, in 2002, about 12% of study households were picking up retirement pensions (~US\$100/month) or Bolsa Escola funds (~US\$7/month) in Portel and Melgaço.

#### *Arrival of Bolsa Família*

Residents reported enrolling in the BFP in 2005–2006. Funds were and continue to be administered through the female household head,<sup>7</sup> who traveled to the municipal seat (either Portel or Melgaço) to claim them during a preset period of the month. To remain enrolled in the program, mothers had to ensure that their children were up-to-date on their vacci-

nations, that children  $\leq 7$  years were brought to health clinics in Portel or Melgaço for periodic nutritional monitoring and vaccinations, and that those of school age (7–15 years) maintained an 85% school attendance rate. For women, participation in pre- and postnatal health visits, common in urban zones, was not a requirement for continued enrollment at the time of this research. Families were paid a base amount plus an additional supplement for each child (up to three children). In 2009, the maximum amount received was ~US\$60 per month.

The rollout of the BFP in the study area was accompanied by federal upgrades to communities' educational systems through expansion of grade offerings and the introduction of professional city-trained teachers (primarily from Portel, Melgaço, and Breves). Importantly, no improvements were made to health infrastructure; in 2009, the study communities still had no health posts.

Based on BFP eligibility requirements (i.e., household income), our 2002 data suggested that all study households should have been receiving some funds from the BFP. In 2009, however, we found that only 60% reported both being enrolled and collecting money—an example of underenrollment found elsewhere in Brazil (Soares, Ribas, and Osório 2010). Reasons for underenrollment included not having the official documents required (e.g., children's birth certificates, national ID cards), administrative backlogs in town, being disenrolled due to low school attendance, and/or simply not understanding the eligibility requirements.

BFP payments raised the mean cash income of the households in the longitudinal subsample by 50%, from US\$130 to US\$199. In 57% of study households, BFP payments had come to represent the largest share of cash income, as reported elsewhere in the Amazon (Brondizio 2011). These sums far exceeded the earlier Bolsa Escola payments but were less than the monthly pensions received by ~12% of households. There were few overlaps between pension-recipient and BFP-recipient households, although cash from both programs seemed to circulate within multigenerational kin groups. Overall, then, BFP payments represented a significant and regular infusion of cash into communities that were formerly barter dependent and cash poor. While BFP democratized access to cash at the community level, programmatic underenrollment led to uneven cash access at the household level.

BFP recipients reported spending this money in ways that indicated close adherence to programmatic intent: in most households, the majority of the money was spent on food, school supplies, and medicines (as elsewhere; see Duarte, Sampaio, and Sampaio 2009). Some households also used funds to purchase generators and electricity-dependent goods such as televisions, DVD players, and small kitchen appliances (often financed through long-term credit arrangements). By 2009, 50% of households had a television. A minority of families also used part of their funds to pay church tithes. As families made monthly trips to town to access their BFP funds, their reliance on barter with the *regatão* declined. At the same time, the cost

7. Like other CCT programs, the BFP targets mothers, as funds managed by mothers have the most immediate and directly positive effects on family well-being.

of travel came out of the BFP funds, lessening the amount available for food purchase.

Based on these spending patterns and following Hodinott (2010), we hypothesized that receipt of BFP funds would, as intended, lead to the regular purchase of extra food and more medicines (e.g., antibiotics, antiparasitics), which would lead to measurable improvements in (a) food security and (b) children's nutritional status (e.g., lower rates of stunting, higher body mass index scores) as a result of increased food intake and improved absorption of macro- and micronutrients through an expected decrease in gastrointestinal/parasitic infections.

## Methods and Data

We used a biocultural approach to test our hypotheses, drawing on detailed diet and health data and informed by ethnographic insights from years of direct observation. We compared data on food security and children's nutritional status over a period spanning the arrival of the BFP (i.e., before and after). The first round of data were collected over a 21-month period between 2002 and 2004, with a convenience sample of 77 households ( $n = 469$  people) across the seven communities, although the anthropometric and dietary data reported here were collected over a more restricted time frame (April–August 2002). The second round of data were collected between May and July 2009, approximately 3–4 years after the arrival of the BFP funds, when the first author returned to the seven communities and sampled 72 households ( $n = 429$  people). Of these, 49 households and 204 individuals were in the original 2002 sample and thus form the longitudinal sample.

Our research design also allows for cross-sectional analyses, as only 43 (60%) of the 72 households sampled in 2009 were enrolled in the BFP, despite the fact that all qualified for the program. Of the 52 households for which we have detailed dietary data on mothers and children, 36 (69%) were enrolled in the BFP in 2009.

We evaluated food security using three measures: dietary adequacy, nutritional status, and perceived food security. Dietary adequacy was calculated by comparing dietary intake, in this case energy (kcal) and protein (g), to mothers' and children's estimated nutritional needs (for more details see Piperata et al. 2011a, 2013). We assessed the energy and protein intakes of mothers and children using the weighed-inventory method (Gibson 1990), over periods of three consecutive days in both 2002 and 2009. This involved weighing all foods consumed by the individual of interest. Brazilian food composition tables were used to convert these data into energy and macronutrient intakes. At the same time the weight was recorded, data on the type of food (e.g., type of fish) and origin (planted/collected/fished/hunted vs. purchased) were also noted. Between April and August 2002, these data were collected from a sample of 30 female household heads. Between May and July 2009, we collected these same data from 52 female household heads (20 of which overlapped with the 2002 sample) and with one randomly selected child between 3 and 16 years from each home.

Children's long-term and short-term nutritional statuses were assessed by measuring their height (cm) and weight (kg) following standard techniques. Height for age reflects growth over a period of time and is therefore considered a measure of long-term nutritional status. Weight, in relation to height ( $BMI = \text{weight (kg)}/\text{height (m)}^2$ ), is a reflection of current or more short-term access to food and thus considered a measure of short-term nutritional status. Reference standards (Frisancho 2008) were used to calculate height for age (HAZ) and body mass index  $Z$  scores (for details see Piperata et al. 2011b).

In addition to these more objective measures, data on local perceptions of food security were also collected. In 2002, we assessed individuals' perceived food security via informal interviews and direct observations of consumption patterns, as a Brazilian perceived food security instrument had yet to be developed. By living in the communities for almost 2 years, the first author had ample opportunity to discuss observed variations in food availability and consumption patterns with household heads and thus gained a sense of people's perceptions and concerns regarding the availability of and access to food. In 2009, we repeated these direct observations and informal discussions but complemented them by administering a locally validated version of the then-new Brazilian food security instrument (*Escala Brasileira de Segurança Alimentar* [EBIA]; Melgar-Quinonez et al. 2008) to the 52 female household heads for whom we also had detailed dietary data. The EBIA consists of 15 questions that elicit respondents' experience of increasing levels of food insecurity—from worrying about running out of food to having a child go an entire day without a meal. A score of 0 (a “no” response to all questions) signifies food security; moderate food insecurity is defined as a score greater than 5, and a score greater than 10 implies severe food insecurity.

We also used ethnographic techniques (unstructured interviews, direct and participant observation) to determine how the BFP and associated conditionalities were understood and negotiated, especially by women, and to document social and economic changes (e.g., cultural ideals regarding food, activity patterns, future aspirations, and patterns of reciprocity) in the communities over time. All data collection methods were approved by the institutional review boards at the University of Colorado (HR 1001.2), Ohio State University (IRB 2009B0056), and the Ethics Committee in the Institute of Biosciences, Universidade de São Paulo, Brazil.

## Results

### *Changing Food Security Patterns*

We found that food security patterns changed markedly between 2002 and 2009. Four interrelated trends stand out.

*Declining Dietary Adequacy among Mothers.* In 2002, energy and protein intakes were, on average, sufficient to meet

women's dietary needs. By 2009, in contrast, the average energy adequacy of the adult women in the sample had declined significantly, from 94% to 74% of their estimated needs, due largely to a decline in carbohydrate consumption (table 1). The same trends were observed in the longitudinal sample ( $n = 20$ ). Among this subsample of mothers, we found a significant decline in energy ( $t = 2.6, P = 0.02$ ) and carbohydrate intake ( $t = 2.9, P = 0.01$ ) but not in the intake of either protein ( $t = 0.7, P = 0.56$ ) or fat ( $t = 1.9, P = 0.08$ ). In 2009, we found no differences in the energy, carbohydrate, or fat intakes of mothers in BFP-receiving households compared to nonreceiving households. However, protein intakes and protein adequacy were higher among those receiving BFP funds (table 1).

*Rising Reliance on Purchased Food.* The decline in energy adequacy of mothers' diets over time coincided with a dramatic and significant shift from locally produced to purchased foods (fig. 1). The share of purchased calories, carbohydrates, and protein almost tripled (from 13% to 33%), and the share of purchased fat soared (from 21% to 71%). Comparing mothers' intakes in 2002 to 2009, we observed a decline in the consumption of home-produced *farinha*, fresh fish, and *açaí* fruit and a steep rise in consumption of purchased foods including *bolacha* (crackers), beans, rice, soybean oil, and meats. The meats included many processed, high-fat, high-salt items such as canned beef, *charque* (dried salted beef), *mortadella* (bologna-like product), and dried and salted offal. By 2009, frozen chicken had become a highly desired food item but was consumed less frequently due to its high price and perishability. These same trends held in the longitudinal subsample ( $n = 20$ ). Using Wilcoxon sign-ranked tests, we found that in 2009 the percentages of dietary energy ( $P = 0.02$ ), carbohydrate ( $P = 0.04$ ), protein ( $P = 0.03$ ), and fat ( $P = 0.01$ ) de-

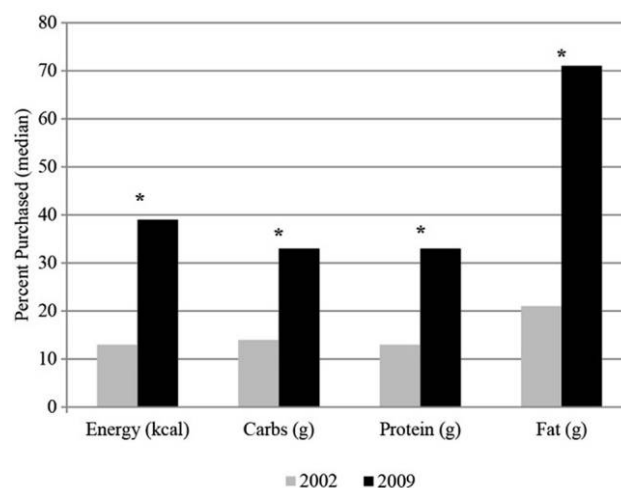


Figure 1. Changes in the contribution purchased foods made to the diets of mothers, panel data 2002–2009 (asterisks indicate Mann-Whitney  $U$ -test,  $P < 0.01$ ; median values reported).

rived from purchased foods were significantly higher among women receiving funds from the BFP than among those who were not. Finally, at the same time that households were purchasing more food, fewer were growing manioc: from 92% of families in 2002 to only 60% by 2009—that is, a third of households had ceased to cultivate this staple crop.

*Growing Concerns about Food Security.* Prior to the arrival of BFP, direct observations revealed significant daily variation in food availability and associated meal skipping. But people demonstrated little anxiety about their access to food and usually attributed hunger to bad luck, which they felt would soon change with a future fishing or hunting trip. If food remained

Table 1. Dietary adequacy of mothers in 2002 and 2009, panel and longitudinal data sets

	2002 ( $n = 30$ , mean $\pm$ SD)	2009 ( $n = 52$ , mean $\pm$ SD)	Independent $t$ -test ( $t$ value)	$P$ value
Panel data set:				
Energy (kcal)	1,882 $\pm$ 426	1,338 $\pm$ 428	5.6	<.01
Carbohydrates (g)	354 $\pm$ 85	232 $\pm$ 79	6.1	<.01
Protein (g)	46 $\pm$ 13	42 $\pm$ 15	1.1	.30
Fat (g)	35 $\pm$ 16	26 $\pm$ 14	2.6	.01
Energy adequacy (%) <sup>a</sup>	94	74	...	...
Protein adequacy (%) <sup>a</sup>	97	95	...	...
	2009 BFP Y <sup>b</sup> ( $n = 36$ , mean $\pm$ SD)	2009 BFP N <sup>b</sup> ( $n = 16$ , mean $\pm$ SD)	Paired $t$ -test ( $t$ value)	$P$ value
Cross-sectional data set:				
Energy (kcal)	1,400 $\pm$ 440	1,170 $\pm$ 358	1.7	.09
Carbohydrates (g)	242 $\pm$ 82	205 $\pm$ 68	1.5	.13
Protein (g)	45 $\pm$ 14	34 $\pm$ 17	2.6	.02
Fat (g)	27 $\pm$ 13	24 $\pm$ 17	.84	.41
Energy adequacy (%) <sup>a</sup>	77	65	...	...
Protein adequacy (%) <sup>a</sup>	115	84	...	...

<sup>a</sup> Energy and protein adequacies are calculated as [(average intake/average requirement)  $\times$  100]; a value of 100 means intake met estimated biological need.

<sup>b</sup> BFP Y = receiving funds from the Bolsa Familia program; BFP N = not receiving funds from the Bolsa Familia program.

scarce for more than a day, people often sought help from nearby family members or neighbors, help they reciprocated when requested.

In 2009, the Brazilian food security questionnaire (EBIA), direct observations, and informal interviews with women revealed significant changes in perceptions of food security. The EBIA data show that all households reported being moderately to severely food insecure (i.e., they answered “yes” to six or more of the 15 questions), and women voiced significant worry over food. One woman with four children under the age of 10 said, “There are days when I just cry with my children because we have nothing to eat.” Another stated that “it happens sometimes that we don’t have enough food, it runs out, I ask but no one has food to give me, at these times my child, my 8-year old, has almost passed out from hunger.” Another woman shared that “when they go without food the children get sad, so sad they don’t even have the desire to play.”

Women reported coping with inadequate food by eating less themselves. This “nutritional buffering” by women was commonly observed in 2009 (Piperata et al. 2013). As one mother said, “I eat less to have enough for the children.” Another coping strategy was for mothers to ration food. One woman reported that “I have to limit the food I give the children. If I let the boys eat until their bellies were full we would run out of food in a week.” Direct observations corroborated reports of careful food rationing, which was most evident with purchased beans and rice, which had become much more common in 2009. However, it was also observed with *farinha*, something never documented in 2002. Whereas in 2002 *farinha* was self-served from a large communal bowl, replenished during a meal, in 2009 it was common for the female head to portion out servings at the start of the meal.

*No Improvement in Children’s Nutritional Status or Dietary Adequacy.* The panel data indicate no significant improvements in child growth between 2002 and 2009 (table 2). Regression models, used to identify the association between re-

ceipt of funds from the BFP and changes in anthropometric status between 2002 and 2009, show that, with the exception of a slight increase in HAZ among male children between 2 and 7 years, receipt of funds was not associated with any other changes in children’s nutritional status (Piperata et al. 2011b).

Further, cross-sectional analyses of children’s food intake show no significant differences in dietary adequacy (energy or protein) or in dietary composition (percent carbohydrate, protein or fat) between those in BFP-receiving and nonreceiving households (table 3). Like their mothers, children in BFP-receiving households ate a greater proportion of purchased foods.

#### *Explaining Declining Food Security since Bolsa Família*

What explains these surprising findings? Our small sample and the fact that we were unable to control for other changes in the communities between 2002 and 2009 limit our ability to fully answer this question. Nevertheless, the first author’s long-term ethnographic engagement with the study communities leads us to posit four key mechanisms by which the arrival of BFP likely led to the outcomes observed.

*Bolsa Família Changed Social Relations around Food Production.* The most immediate impact of BFP funds was to allow households to produce less *farinha*, for two reasons. First, BFP funds allowed women to substitute *farinha* with market foods, and, second, once they had access to regular cash, families no longer needed to produce *farinha* to exchange for market goods. However, our data suggest that food purchased with BFP funds was insufficient to replace *farinha* and ensure food security, as families ran out of food before their next BFP payment. This raises the obvious question: why did families not increase *farinha* production or harvest more wild foods to cover the shortfall? Addressing this question requires a closer look at how social relations around labor were transformed by the cash infusion and conditionalities of the BFP program.

Table 2. Changes in children’s (<18 years) nutritional status: height for age (HAZ) and body mass index (BMIZ) in the panel and longitudinal data sets

Measure	2002 (mean ± SD)	2009 (mean ± SD)	Independent <i>t</i> -test ( <i>t</i> value)	<i>P</i> value
Panel data set: <sup>a</sup>				
HAZ (male)	-2.0 ± 1.2	-1.8 ± 1.0	-1.30	.18
HAZ (female)	-1.8 ± 1.1	-1.7 ± 1.1	-.96	.34
BMIZ (male)	-.41 ± .91	-.29 ± .90	-1.40	.30
BMIZ (female)	-.35 ± 1.1	-.50 ± .98	.61	.54
	2002 (mean ± SD)	2009 (mean ± SD)	Paired <i>t</i> -test ( <i>t</i> value)	<i>P</i> value
Longitudinal data set: <sup>b</sup>				
HAZ (male)	-2.0 ± 1.3	-1.8 ± .97	-1.6	.11
HAZ (female)	-1.6 ± 1.20	-1.7 ± .84	.87	.37
BMIZ (male)	-.29 ± .96	-.24 ± .63	-.41	.69
BMIZ (female)	-.39 ± 1.32	-.15 ± .78	-1.2	.23

<sup>a</sup> Panel data set: sample size, 2002: males = 142, females = 152; 2009: males = 138, females = 133.

<sup>b</sup> Longitudinal data set: sample size, 2002–2009: males = 63, females = 69.

Table 3. Characteristics of children's diets in 2009

	All ( <i>n</i> = 52, mean ± SD)	BFP Y <sup>a</sup> ( <i>n</i> = 36, mean ± SD)	BFP N <sup>a</sup> ( <i>n</i> = 16, mean ± SD)	Independent sample comparisons ( <i>P</i> value)
Energy adequacy (%) <sup>b</sup>	76 ± 25	79 ± 24	71 ± 26	.26
Protein adequacy (%) <sup>b</sup>	181 ± 61	192 ± 60	157 ± 57	.07
% carbohydrate	70	69	72	.70
% protein	12	12	12	.92
% fat	18	19	16	.30

<sup>a</sup> BFP Y = receiving funds from the Bolsa Família program; BFP N = not receiving funds from the Bolsa Família program.

<sup>b</sup> Energy and protein adequacies are calculated as [(average intake/average requirement) × 100]; a value of 100 means intake met estimated biological need.

Prior to BFP, community-level cooperation and a well-defined, within-household intergenerational and gendered division of labor were critical for securing food resources. Men and boys hunted, fished, and gathered *açaí* and participated in *mutirões* (interhousehold cooperative groups) to prepare forest plots for manioc gardens. Whole families, including children, contributed to planting and maintaining the garden and, after a year, to harvesting and processing the roots into *farinha*. Meanwhile, all housework, childcare, and food preparation (including the processing of *açaí*, fish, and game) were conducted by women and their female children.

We argue that the arrival of the BFP transformed this food production system in several ways. First, household heads reported that the availability of BFP cash meant that people began expecting cash for their labor. This had a particularly strong effect on the *mutirão* system, as members of different households became more reluctant to assist their extended kin or unrelated neighbors to fell gardens without a cash payment. Families who did manage to maintain manioc gardens were less willing to share their crop. In fact, in 2009, such households sold their *farinha* to family and neighbors for cash. Moreover, the fact that most households qualified for (but varied in their success at securing) BFP funds bred resentment, which undermined forms of interhousehold support and reciprocity (see also Ansell 2014).

In addition to the impact on the *mutirão* system, less adult male labor was directed at food procurement in 2009. It was clear that household heads understood that BFP funds were “supposed” to be spent on food and other necessities; men came to feel that what the family “should” be eating were foods purchased with his wife’s BFP funds. For example, one male head explained, “Food is my wife’s concern; she uses *her* money [i.e., BFP funds] to buy the food.” By 2009, the first author frequently observed that men acted on this perception by increasing their leisure time, by fishing and hunting only when purchased foods ran low, and by increasing their interest in wage-earning activities. All of these responses deepened families’ reliance on purchased foods.

In addition to the impact of cash on social relations and men’s labor, the conditionalities of the BFP program pulled child labor from subsistence work. Households thus had to manage subsistence activities with less assistance from children, because low school attendance would mean being cut

from the BFP. This impact was particularly strong for teenagers who became less available to assist in agricultural production and/or sibling care due to expanded grade offerings under BFP (from fourth to sixth grade in most communities and to the eighth grade in one community). In addition, after children completed locally available coursework, many were sent to Portel or Melgaço to continue their studies. The absence of adolescents in the communities was quite noticeable in 2009.

These changes in intra- and interhousehold social and labor relations contributed to families’ perceived inability to maintain manioc gardens, which was repeatedly cited as the principal reason for hunger in the BFP era. As one female head stated, “Without a garden it is hard, at least with a garden I have a little manioc, a fruit, something for the children, now I can do nothing.”

*Program Conditionalities Reinforced Urban Desires and Aspirations.* Another significant impact of the BFP is to increase the exposure of *ribeirinhos*—particularly women and children—to life in town. One effect of this exposure is that women chose to use their BFP funds to purchase food items that they associated with modern urban living, emulating the consumption patterns of their poor urban relatives (see also Murrieta 2001). This was especially noticeable with protein sources, as women chose to use BFP funds to purchase beans and preserved and processed meats commonly consumed in town. Many women also reported buying *bolacha*, powdered milk, and *Nescau* (a chocolate flavored powder mixed with water or milk), as these items were requested by children. This pattern of consumption was reinforced by urban merchants who extended more credit to BFP recipients.

Even as BFP shifted the behaviors and desires of adults, it increasingly exposed children—especially teens—to urban life (and the market relations that sustain it) through accompanying their mother on visits to the city, daily contact with city-educated teachers, and BFP-inspired urban school attendance. These direct experiences were further enhanced by increased exposure at home to television, DVDs, cell phones, and other BFP-purchased media that reinforce the attraction of urban life (see also Pace and Hinote 2013).

Conversely, children were spending less time in intergenerational interactions and subsistence activities, lessening



their opportunities to gain the traditional knowledge essential for securing a rural livelihood (see also Cardoso and de Souza 2011). The combined result was that by 2009 teens had fewer subsistence skills and demonstrated markedly less interest in mastering them while they increasingly envisioned their future in an Amazonian town (see also Steward 2007).

*No BFP Investments in Rural Sanitation or Health Care Infrastructure.* Compounding the impacts of BFP on dietary change was the fact that the arrival of the program was not associated with any improvements in rural sanitation, either by the state or by recipient households. Indeed, no BFP recipient appeared to have invested funds in a pit toilet, as 10% fewer households had them in 2009 (in 19% of households compared to 29% in 2002). In addition, the number of families accessing well water remained constant at about 37%; the remaining families continued to rely on river water. Thus, despite money for (and frequent reported purchase of) medications, the continued lack of sanitation infrastructure and reliance on surface water maintained conditions for chronic gastrointestinal/parasitic infection. The combination of energy inadequacy, reduced nutrient absorption due to high parasitic burden, and continuous immunostimulation likely explains the persistent stunting found among children.

*BFP Effects Transcend the Household Level.* Our data suggest that BFP-recipient households experienced few nutritional improvements and a marked decline in food security over time. But, what explains the similar findings among families who did not receive BFP funds? In the absence of a control group (the BFP was rolled out simultaneously across all communities), we rely on our ethnographic insights to posit that the answer lies in the way in which rural Amazonian households are embedded in complex social networks (Padoch et al. 2008; WinklerPrins and Souza 2005). By infusing cash into these networks of mutual support, the program's negative effects on food security were community-wide, even as access to BFP funds was not (see also Rizek and Morsello 2012). It thus appears that the financial capital offered by the program is insufficient to offset the concomitant decline in social capital. Given the historical importance of labor reciprocity and food sharing in buffering Amazonian livelihoods during prior booms and busts (Bunker 1985; Moran 1981; Weinstein 1983), the BFP boom might appear to be undermining *ribeirinho* resilience and catalyzing an irreversible city-ward shift in livelihood strategies.

## Discussion

The remarkable rise of CCT programs over the past 20 years represents the ascendance of financial instruments and capacity-building logics in poverty alleviation (Saad-Filho 2015). Notwithstanding the very real benefits that these programs have delivered, this study serves as a reminder of these programs' important and often-overlooked limitations in three key areas.

First, we still know too little about the effects of the BFP program on child and maternal food security. A large body of research demonstrates the importance of adequate nutrition for child physical and cognitive development (Chilton, Chyette, and Breaux 2007), and a growing literature is identifying pathways, including epigenetic mechanisms, that link maternal well-being (physical and mental) with child health outcomes in both the short and long term (see review in Hicks and Leonard 2014). These data show that food security is a prerequisite for meeting the program's long-term goal of breaking the intergenerational cycle of poverty. Our study's direct measurement of maternal and child dietary adequacy suggests that the BFP is not simply falling short of its goals in this rural context but is actually undermining food security at the individual, household, and community level. Furthermore, the fact that nutritional education and monitoring of pregnant and lactating women were dropped as conditionalities for these rural recipient households leads us to question the degree to which the program takes seriously the well-known links between maternal and child health. Future research must go beyond consumption patterns as a proxy for food security and utilize more direct measures of mothers' and children's dietary adequacy to determine whether the BFP is in fact improving food security. Such data would improve our understanding of the degree to which children are sufficiently nourished to be ready to learn, and would thus complement the large literature on BFP impacts on schooling.

Additional research should explore the degree to which BFP and comparable programs are accelerating the nutrition transition among targeted populations (see Silva 2009). Elsewhere in Brazil, Cotta and Machado (2013) report that the receipt of BFP funds coincided with an increase in the consumption of processed, energy-dense foods; our study echoes these findings. Ultimately, our data point to a need for closer monitoring of the ways in which cash payments to rural folk might not only undermine their food security but also contribute to costly, long-term health problems associated with chronic malnutrition.

Second, our study offers much-needed scrutiny of BFP in a rural—as opposed to an urban or peri-urban—context. We suggest that the BFP can distort rural economies by becoming a primary source of income in a cash-scarce setting rather than playing the supplementary-income role that it has in most urban Brazilian contexts (Saad-Filho 2015). As a result, the BFP appears to have contributed to the unraveling of the moral economies so central to peasant livelihoods, in part by depriving the system of children's labor (see Lancy 2015 for a discussion of the importance of child labor for ensuring rural food security). But just how inevitable is this effect? To what extent are similar dynamics found across the vast and heterogeneous Brazilian Amazon? And why do our findings differ so dramatically from CCT assessments in rural Mexico and Malawi, which indicate that cash payments were invested by the poor into agricultural production, with a marked increase in food security (Miller, Tsoka, and Reichert 2011; Todd, Winters, and Hertz 2010)? These questions suggest that there

is much to be understood about CCT efficacy across the diverse rural spaces where such programs are being implemented.

Further, our findings highlight the incompleteness of any CCT program when it is not matched by investments in health care infrastructure in rural zones. Our findings echo concerns voiced by Hall (2008) and others (Guanais 2013; Kerstenetzky 2009; Madeiros da Fonesca and d'Ávila Viana 2007; Saldiva, Silva, and Saldiva 2010; Sánchez-Ancochea and Mattei 2011; Soares, Ribas, and Osório 2010) that the BFP may be detracting public funding away from the supply-side investments in basic education and health infrastructure that would improve human capital outcomes in the long run. In addition to the fact that in 2009 people in the study communities still had to travel 8 hours for any type of medical care, improvements to educational infrastructure were also minimal, and there was a high rate of teacher absenteeism. Thus, while children were losing opportunities to gain traditional knowledge essential for securing a rural livelihood (see also Cardoso and de Souza 2011), our direct observations suggest that their formalized training was likely inadequate for gaining employment in town that would provide a pathway out of poverty.

In such contexts, it might be argued that CCT programs are merely serving as a Band-Aid remedy to the devastating impacts that neoliberal development policies have had on the poor (see, e.g., Saad-Filho 2015). Without binding government commitments to meaningful investment in social programs, the long-term legacy of CCTs may amount to little more than temporary succor, especially for the most marginalized rural poor.

Finally, our study rests on a foundation of embedded research that takes seriously the ethnographic mantra that “context matters.” Indeed, we would argue that the assessment of poverty-reduction programs will always be incomplete if they fail to attend to variation within and across targeted populations. For example, this study emphasizes not merely that BFP failed to improve food security but *why* it had this effect given the political-economic path dependencies, environmental endowments, and social relations that characterized the study communities. We turn to the implications of this insight for disciplinary engagement with poverty-reduction policies.

## Conclusions

Bioculturally oriented anthropologists have long been interested in how social variables, including poverty and inequality, shape human biological variation and health (see review in Hicks and Leonard 2014). Yet, few of us directly address the impact of policies that aim to ameliorate the poverty and inequality whose effects we are so intent on studying. As researchers on the ground, working directly with the economically and politically marginalized populations these policies target, we often have critical ethnographic and biological data that can not only inform the design of such programs but also test and explain program efficacy. The baseline data we use in this paper are such an example, and inspire us to go beyond

the standard argument that anthropologists should “be at the table” and urge our colleagues to *lead* policy-relevant research. We recognize the limitations that our sampling methods and sizes—essential for gaining the critical insights our ethnographically grounded work supplies—present when attempting to make broader policy statements. A way around this limitation is to use our scholarship to generate research questions we can test on a broader scale with colleagues in disciplines with a longer tradition of policy engagement, including economics, political science, sociology, and public health. Like others (Hicks and Leonard 2014) we suggest that the work we are advocating for can remain theoretically rigorous at the same time it addresses the critical challenges we face in the twenty-first century and better translates our science for the greater public good (Brewis and McKenna 2015).

In conclusion, we find it remarkable that the BFP has become a global model of poverty alleviation despite little scrutiny of its performance with respect to its own programmatic goals and with serious geographical limitations in its evaluation. Its global replication—or its replacement by some other type of program—should therefore be monitored with care. Anthropologists should play a leading role in program monitoring, as we are ideally trained to understand how and why such a program works—and when it does not, we should call for change.

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## Comments

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This paper draws on a biocultural natural experiment in rural Amazonia to measure the local impacts of Programa Bolsa Família (PBF) and presents us with a rare opportunity not only to evaluate this conditional cash transfer program from a new perspective but also to discuss how large-scale public policies and programs addressed in rural areas are planned, implemented, and evaluated in Brazil. In a country the size of a continent, with striking natural, socioeconomic, and cultural diversity, as well as few governance institutions at the regional level, boosting rural development and delivering public services to rural areas are not trivial tasks (Beduschi Filho and Abramovay 2004). Although there have been improvements in public health since the 1988 universal health reform, health care inequities and inequalities persist in more remote rural areas, especially among indigenous people, Afro-Brazilians (*quilombolas*), landless families (Coimbra et al. 2013; Le Torneau 2015; Victora et al. 2011), and, as Piperata et al. have discussed, riverine people (*ribeirinhos*) too. The same can be said about education.

From a governance point of view, the paper shows us that monitoring and evaluating PBF at the local scale is essential

to understanding its impacts regarding local dynamics in rural Amazonia. At this scale, the public policy management councils have an important role to play and would need to be included in further investigations aiming at a broader perspective. The councils are the most comprehensive form of institutionalized participation in Brazil and have the legal status to create new agendas and criteria for governmental actions at the municipal level (Barth 2006), where context matters. Understanding the internal and external factors that influence the capacity of the councils to assume their legal responsibilities, their representativeness and negotiation processes, and how they are positioned in a wider political and socioeconomic context (Barth 2006) are an open field for political ecology studies in the Amazon.

The paper also points to an important and neglected trend in Brazil by looking at the impacts of PBF at the local level, which are changes in gender relations. At the population level, PBF is usually considered as having a positive impact by empowering women to increase their share in household income. Between 2000 and 2010, the number of women as household heads in rural areas in Brazil increased from 12.4% to 25.1% (IBGE 2014). However, when the household micropolitics of gender relations is considered, the truth is that becoming the main provider has increased burdens on women, which, in situations of food insecurity such as the one reported by Piperata et al., lead to increased physical and psychological stress, an undervalued research topic. The significant changes in perception of food (in)security and the nutritional buffering strategies employed by mothers observed by the authors, together with men's attitudes (e.g., "food is my wife's concern"), demonstrate some of the unexpected gender side effects that large-scale programs can have at the household level.

The replacement of traditional, locally produced food with items purchased at markets, observed by Piperata et al., adds to other case studies that show that the nutrition transition is a reality in the Amazon region (Nardoto et al. 2011; Piperata et al. 2011*b*; Sarti et al. 2015). The incorporation of urban values by rural people, and the erosion of traditional food production systems, local knowledge, and reciprocity networks, is exacerbated in the Amazon region by the ecological footprint of food items produced thousands of miles away, such as frozen chicken. Inadequate handling and improper food storage of imported food, as can be seen throughout Amazonian street markets in Brazil, Peru, and Colombia, may also increase the risk of health problems (Nardoto et al. 2011; van Vliet et al. 2015).

The paper is also an important contribution and a cautionary tale on the debate on the regulation and implementation of cash transfer programs for payment of ecosystem services (PES) in Brazil (avoided deforestation, adoption of more sustainable rural practices, and recuperation of degraded areas). These aim to enhance the livelihoods of forest-dependent populations. In some cases, such as Bolsa Floresta in the state of Amazonas, cash transfers are linked to improvements in ed-

ucation and health care delivery (Börner et al. 2013). However, in other countries such as China, PES are not linked to health and education goals and, in some cases, have caused a disruption of local food production systems, substitution of subsistence by cash crops, decline in household income due to lack of off-farm jobs, and increased household dependency on subsidies as a result of loss of farmland (Bullock and King 2011; Robbins and Harrell 2014; Wang and Maclaren 2012). If used as a model in the Amazon, these PES systems could have perverse effects on food security at the local level. On the other hand, future PES programs are an opportunity for researchers and policy makers to test the effects of cash transfer programs using baseline data and comparison groups, while controlling for confounding factors (such as other income sources like rural retirement pensions), all of which are missing in most cases (Börner et al. 2013).

Notwithstanding the caveats identified by the paper, PBF is responsible for a considerable reduction in poverty and inequality in Brazil (Soares et al. 2006), and adjustments along the way should be expected. As Ostrom (1999) reminds us, policies should be considered as experiments, subject to constant monitoring, evaluation, innovation, and adaptation. In the Amazon region in particular, innovative solutions for providing basic public services that build on local contexts and technological innovations could emerge and be tested at the local level, improving sanitation and access to clean water and health care (DeSouza et al. 2014); these are crucial aspects contributing to adequate nutritional status.

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Piperata, McSweeney, and Murrieta's article is the first longitudinal study of the impact of the large-scale Brazilian conditional cash transfer (CCT) program Bolsa Família (BFP) on the nutritional status of children in the Amazon. Using a bio-cultural approach, the article also evaluates BFP's implications for mother and child food security, consumption patterns and nutritional transition, household land use, and community relations. In the context of CCT's expanding importance, the authors engage directly with a needed policy discussion regarding the efficacy of such programs, as currently implemented, to address both immediate food insecurity and intergenerational poverty.

The key contribution of the article is elucidating mechanisms connecting decline in nutritional status of children participating in the program to recurrent structural deprivations that families face in terms of access to health, education and professional training, employment opportunities, and sanitation services. While the focus on monetary transfer, schooling,

and vaccinations has been important, this emphasis has happened in a vacuum of broader social investments, particularly in social services and sanitation infrastructure. Along with other changes in the region, the article shows that the BFP has contributed to trigger higher dependency on processed foods, declining food self-sufficiency, changes in forms of community reciprocity, and circulation to urban areas. It shows evidence of the growing family dependency on subsidies, limited opportunities to improve human capital and employment possibilities, and lack of attention to mothers' health and emotional stress. Their analysis reveals that in this region the BFP remains more remedial than transformative, raising serious questions about the potential long-term consequences for vulnerable sectors of society.

As Piperata et al.'s article is printed, Brazilian society is in the midst of one of the most troubling and uncertain political-economic crises in recent decades. The BFP has been the main symbol of social policies implemented during the past 13 years, and, genuinely or not, it has received support from across the political spectrum. The importance it has gained for large sectors of the population and local economies makes it an almost untouchable—but frequently manipulated—policy subject in Brazil. The ongoing crises, as uncertain as the outcomes may be, include debates about the successes and failures and the potentials of the BFP. Given the importance of CCT programs, more empirically grounded conversations, as in this article, are needed.

In other parts of this region, despite strong family participation in markets for forest fruits, dependency on CCT programs and retirement also remains dominant. Household surveys suggest that only a fourth of households actively engaged in resource/agricultural economies were able to have their productive activities as a primary source of income (Brondizio, Vogt, and Siqueira 2013). A recent study comparing vulnerability and social conditions in 41 cities in the same region as in Piperata et al.'s study shows that the majority of the population is in a condition of moderate to high vulnerability in terms of social indicators such as income and housing conditions, sanitation infrastructure, and susceptibility to flooding (Mansur et al 2016). In fact, the sanitation conditions in most rural and urban areas in this region have worsened or otherwise not changed since the early 2000s. Mostly insolvent, municipalities have not been able to follow the pace of demand for basic services. In other words, the precarious rural situation reported in the article also reflects the situation of other parts of the Amazon estuary-delta.

In spite of these parallels, two considerations are warranted. First, given the diversity of the Amazon, urban and rural, it is likely that we will continue to see mixed results and outcomes of the BFP. The social context and type and quality of social services offered to low-income families at the local level can vary significantly, influencing positively and negatively the outcomes of the BFP. The paper brings forth the need for more coordination around data collection and shar-

ing and collaborative assessments that can be useful to policy making at the regional and local levels.

Second, it is important to recognize the role of other factors influencing social changes, such as abandonment of agriculture and nutritional transition, in this region. The region has been subjected to other forms of government subsidies and monetary transfers. Engagement in globalized forest economies has also contributed to regionwide decline in annual agriculture. Other trends include faster transportation and communication and significant increase in access to television and the Internet. The consequences of these changes to local social conditions are still unfolding.

Finally, the article contributes to bring to front a needed discussion about social indicators of development. This is a discussion that also contributes to the newly agreed sustainable development goals. As noted, given the dearth of data, it is indeed surprising the level of uncritical enthusiasm of policy makers with CCTs. During the past decade, the Brazilian government has privileged unidimensional measures of class mobility, that is, income, over multidimensional analysis of social indicators reflecting social and economic conditions more comprehensively. The reductionism of social conditions and well-being to monetary metrics has contributed to inflate political claims of poverty alleviation and, more broadly, the rise of the middle class in Brazil. Indicators of access to basic services, such as sanitation and sewage, quality of education, type of employment opportunities, and individual and social stress, particularly, widespread violence and neighborhood insecurity, paint a very different picture. These indicators are most critical in the Amazon region. Arguably, the academic community has been largely indifferent to the implications and the political undertone that have set the frames of reference for defining and evaluating indicators of development and well-being in Brazil.

Whether remedial or not, the BFP has played a key role in providing regular cash flow for households and as such at least partially minimized food insecurity for a large segment of society. It will take time to assess whether CCT programs are contributing to break a poverty cycle or perpetuate it. Given the importance of CCT programs, there is enough evidence to suggest serious reconsiderations about the revisions needed to improve their chances of success.

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In addressing the impact of Brazil's flagship conditional cash transfer (CCT) program on the needs of the rural poor, the authors Piperata, McSweeney, and Murrieta call attention to an important topic that has received little scrutiny.

Poverty is an overwhelmingly rural phenomenon worldwide (World Bank 2003). Brazil, whose Bolsa Família is said to

be a model for such programs (Soares, Ribas, and Osório 2010), has the largest rural poor population in the Western Hemisphere (IFAD 2008; World Bank 2009), with no less than 45% of its rural population identified as poor in recent years (ECLAC 2008).

In this commentary I wish to endorse the findings of the authors that programs of this kind work well only in association with adequate infrastructure and services. To do so, I take the case of São Gabriel da Cachoeira, a remote municipality in rural Amazonia, some 2,400 km from the sites discussed by Piperata et al., where I have noted a number of unexpected outcomes of the Bolsa Família program.

With 109,185 km<sup>2</sup>, São Gabriel da Cachoeira is one of Brazil's largest municipalities. Its population of 39,129 is sparsely dispersed over a vast, forested area, with an overall population density of only 0.35 km<sup>-2</sup> (IBGE 2015). One-half of this population, numbering 22,035, resides in 419 widely dispersed, riverine communities, where household economies are based on fishing and horticulture. The rest of the state's residents, numbering 17,094 people, live in the single urban hub, a city of the same name in the extreme southeastern corner of the municipality. About 75% of residents identify themselves as indigenous, a category that has no bearing on their eligibility to receive the Bolsa Família.

### Access

A chief problem of CCT programs is that the principle of conditionality assumes access to the services necessary for eligibility. Two kinds of services are conditions of the cash transfer in Brazil: educational and medical. A third type of service, financial, is also necessary to receive the stipend. The difficulty of access to any one of these services undermines the goals of the program.

The monthly payment is provided by means of a government-issued debit card that accumulates value and that recipients can use to make purchases. To obtain the card and to make transactions, a recipient must visit an authorized financial institution no less than once every 90 days. Within the municipality only two institutions provide the services necessary to register and receive the benefits.

The presumption of access to educational and health resources is not borne out in the case of São Gabriel da Cachoeira. The municipality has only 245 primary schools and 14 high schools. Residents may wish to enroll their children in school, but no additional schools have been constructed since the program began. In the region where I conducted fieldwork, a population of 600, living in 12 villages along a 60-km stretch of river, shares two primary schools and a high school. Parents who wish to comply with the conditions of the Bolsa Família, or who simply want to educate their children, must be willing to place them with relatives in one of the two villages with schools. Hosting families are burdened by having additional mouths to feed, while the families of students undergo the hardships of separation.

Similarly, accessing medical services is not easy. Of the 22 medical facilities provided by state and federal governments, only two have overnight facilities; none provides general surgical facilities. Those needing serious medical attention must travel 1,200 km by air to the state capital, Manaus, an expense that is regularly borne by the national health service, FUNASA, at great expense.

In developing nations where the rural poor generally lack personal vehicles and where public transportation is unreliable or unavailable, travel to distant services can be arduous and costly. In São Gabriel da Cachoeira, a municipality the size of Austria, the distance from a community to the city may be as far as 650 km and entail up to 7 days traveling by canoe. In such a region, the rural poor are doubly jeopardized. First, they are neglected in the distribution of goods and services, and, second, they are subjected to higher prices when goods are available. For example, travel by motorized canoe, when possible, requires the purchase of gasoline, the price of which fluctuates between US\$1.75 and \$2/L. For the most remote residents, the amount of gasoline required to make a trip to the city can be as high as 700 L, bringing the cost of a round-trip visit to the bank or clinic to US\$1,110. Pooling costly resources is common.

### Urbanization

In order to obtain vital services and receive monthly cash transfers without incurring the exorbitant costs of travel and family separations, an increasing number of families are leaving the countryside to live in the city. In the 12 villages where I conducted fieldwork, approximately one-third of the population has resettled in the city, leaving the rural areas seriously underpopulated.

Among the correlates of the consequent urbanization is the shift, noted by Piperata et al., from locally produced foods to purchased produced foods. The cash flow from the CCTs, facilitated by government-issued debit cards, is thereby channeled to local merchants, who, although not poor, rural, or needy, may be the ultimate beneficiaries of the Bolsa Família.

Another consequence of urbanization is minoritization. Throughout the municipality, some 30 indigenous languages are spoken. With emigration to the city, native languages become minoritized or lost as youths take up more dominant languages such as Portuguese. In spite of its status as the largest indigenous city in Brazil, São Gabriel da Cachoeira paradoxically faces the danger of becoming the nation's largest linguistic and cultural graveyard.

### Distribution

The benefits provided by the Bolsa Família are contingent on services that are inadequately distributed. In rural areas, persistent service deficits and the concomitant difficulties of access to them place unnecessary burdens on the families that need and would use these benefits (Parsons 2010). Moreover,

the fundamental mission of the Bolsa Família program to intercede in the reproduction of poverty is undermined without these critical services, as are the goals of a nation committed to extending standards of health and education to all of its citizens.

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4 IV 16

With this assessment and analysis of the effects of the Bolsa Família program (BFP) in rural Brazil, Piperata and colleagues have made an interesting and important contribution to biocultural scholarship. They effectively combine anthropometric, dietary, and ethnographic methods to assess the local effects of this national program and make a convincing case that anthropologists should engage more directly with issues of policy. While they discuss evidence that this program has helped contribute to an overall decline in levels of inequality in this country, they highlight the need to understand how the program plays out in particular communities. They raise and explore a number of important questions including whether the program is associated directly with indicators of maternal and child diet and health and why so many of the households that are eligible do not receive benefits. I will discuss two of what I see as the central contributions of the paper, as well as some of the questions raised for me by its analysis.

An important theme of the paper is the degree to which BFP represents a break with neoliberal economic policy. The authors argue that CCT programs are politically viable precisely because they do not address fundamental structural inequalities. Piperata and colleagues illustrate this through their analysis and discussion of child health. They interpret static indicators of growth as evidence that this program is inadequate for addressing growth stunting in the absence of systematic investment in infrastructure, including access to clean water and comprehensive health care. They raise important questions about whether money spent on BFP reduces the resources available for other means of reducing poverty. Their analysis is relevant for thinking through some of the contradictions and limitations involved in the leftward shift in Latin American politics in recent years. A number of authors (e.g., Radcliffe 2011) have explored how the logic of global neoliberalism constrains and shapes policy on the part of left-leaning administrations such as those in Brazil, Bolivia, and Ecuador and the possibilities for improving people's lives. This paper offers an important perspective on competing efforts to define and promote economic development and improvements in public health. It would be interesting to hear more from the authors on how they weigh the apparent costs and benefits of this program for different communities in Brazil.

A second important theme is the implication of BFP for labor practices and subsistence strategies in this rural setting and the downstream effects on health. The authors found that the influx of cash influenced social relations around food production and led to a decline in subsistence farming of manioc. Family and neighbors began expecting cash for labor, and practices of sexual and generational division of labor were disrupted, leading to a greater reliance on purchased foods and more frequent experiences of food scarcity. Importantly, they argue that these effects extended to households not receiving BFP transfers because of the widespread effects on inter- and intrahousehold relations. Their findings are strikingly similar to those of a number of authors conducting work in the Andes. For example, Leatherman (1998) found that the expansion of wage labor in rural Peru was associated with similar reductions in access to extra-household labor during critical agricultural windows, a decline in the ability of many families to pursue subsistence farming, and increased rural to urban migration. Like these authors, Piperata and colleagues illustrate the importance of long-term ethnographic engagement alongside biological data collection to understand the lived experience of economic change.

The authors acknowledge some limitations in their data and argue that an important contribution of their analysis is raising additional research questions. They suggest, for example, that further research is needed to determine the degree to which this program is promoting a transition toward a more energy-dense diet. Given the association between growth stunting and chronic disease in adulthood (Kuzawa 2005), this is an important question. This would be a meaningful contribution to other recent scholarship on the ways in which economic policy shapes and constrains dietary choices and health outcomes across generations (Wells 2012; Wiedman 2012).

Their analysis raises some other questions for potential investigation by anthropologists with diverse perspectives. One limitation they note is in their ability to tease apart the effects of BFP from other trends affecting this community. Additional ethnographic research would be useful for understanding how this specific CCT program interacts with other forces of political and economic change (e.g., resource extraction) and the degree to which changes to BFP in rural areas would be able to help mitigate the negative social and health consequences outlined in this paper. Another fascinating question is how people in this and other communities experience the "conditional" part of this program. How do people negotiate bureaucratic encounters with representatives of the state, and how might these experiences influence both their health and their engagement with various forms of health care? Finally, it would be interesting to investigate whether and how research on this program is mobilized in political settings in Brazil. The economic policies initiated under the leftist Lula administration are currently at the center of political unrest and accusations of corruption (Democracy Now 2016). Presumably, these debates will help determine whether this and other popular programs are altered or rolled back. If anthropologists are to engage with policy debates, it seems critical to un-

understand how to do so most effectively. This would be a good context to explore this question.

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#### Environmental Income and Food Sovereignty in Remote Rural Contexts: The Missing Factors in the Impact Evaluation of Conditional Cash Transfers

Piperata and colleagues make an important contribution to our understanding of the effects of conditional cash transfers (CCTs) on food security. We should particularly applaud their focus on subsistence-based rural households, because there is a dearth of information about CCT effects in this context. In this comment, I revisit their article to highlight aspects that I believe were left unaddressed or deserve clarification to advance our knowledge of CCT impacts.

The article's findings raise an important concern over whether transfers from Bolsa Família program (BFP) have succeeded in promoting food security. However, previous evidence, despite being geographically biased, was already non-consensual, with reviews suggesting both positive impacts and shortcomings of the BFP on food and nutritional security (Cotta and Machado 2013). For instance, households benefitting from BFP transfers spend larger amounts of cash on food when compared to nonbenefitted families (Duarte, Sampaio, and Sampaio 2009) and experience lower vulnerability to anemia in children (Cotta et al. 2011) and, under some conditions, lower rates of wasting (Andrade et al. 2013), all considered positive. In contrast, certain studies conclude that the BFP has no effect on growth rates (Andrade et al. 2013; Saldiva, Silva, and Saldiva 2010) or even reduces food security, in consonance with Piperata and colleagues. Particularly worrisome is the occasional promotion of malnutrition, due to the amplification of the intake of high-energy foods (Saldiva, Silva, and Saldiva 2010), leading to higher rates of overweightedness and obesity (Cotta and Machado 2013; Leroy et al. 2013). Hence, accumulated knowledge suggests that the outcomes of BFP on food security are both positive and negative. What seems left unaddressed here and in the current literature are probably two main issues.

First, beyond geographical and contextual differences, variations in the indicators adopted to assess BFP impacts on food security might explain divergent conclusions. While access to cash through CCTs may raise the amount spent on food, the consequences on food consumption and nutritional security depend on the type of food purchased and, among rural households, the indirect consequences on the sourcing of locally produced or gathered foodstuffs. Studies about the effects of market integration on partially autarkic groups,

several of which have been conducted by anthropologists, are an outstanding source of insights to understand CCT consequences in remote contexts. These studies have long established that the effects of increased access to cash income on the use of renewable natural resources and several well-being attributes, among which is nutritional status, are sensitive to the indicator adopted in the analyses (Godoy et al. 2005; Lu 2007). Therefore, direct measures of food security, such as those investigated by Piperata and colleagues, may be necessary but not sufficient for policy purposes. Instead, understanding the mechanisms by which CCTs impact food security requires disentangling the puzzling and often nonlinear relationships between transfers and outcomes, in addition to the role of contextual factors (e.g., access to environmental income, distance from markets, social capital) and household characteristics (e.g., demographic attributes). Variations in explanatory factors—how access to BFP is conceptualized and estimated—are also important. Commonly estimated is the access to cash, because in remote rural contexts it may transform the balance of incentives to invest in local food production and gathering from natural environments. However, CCTs may also operate through other paths, such as conditionalities, which may drive labor away from subsistence practices or may transform food and sanitation habits due to health visits (Attanasio, Oppedisano, and Vera-Hernández 2015). Changes in people's perceptions and food habits may also accompany increased exposure to urban societies during visits to towns to cash in benefits (Teixeira et al. 2011). These complex interlinks imply that it is not the econometric nature of the analyses employed by most studies that is problematic, as argued here. On the contrary, analytic tools developed for studying the impacts of interventions are essential because they help to unravel the puzzle in situations that differ in a multitude of factors. Additionally, they help with associations between variables likely to be nonlinear, consequences at multiple levels (individual, household, and community), and cross-scale issues that affect impacts.

Second, rural and urban contexts vary, but there is also a multitude of rural contexts, from those integrated into global markets to more autarkic family-based economies, such as the one studied here. Although the accumulated evidence suggests that CCT impacts may differ across contexts, current evaluations either amalgamate contrasting situations or are locally based studies that fail to interpret the particularities explaining BFP outcomes to food security. The geographical bias in BFP evaluations, which indeed neglect Amazonian contexts but also other subsistence-based contexts alike, may thus hide certain perils. To evaluate them, disaggregating rural and urban official statistics, as the authors suggest, should help, but with limitations. This is so because the classification of localities as rural or urban in Brazil does not follow an accorded definition, relying instead on municipal decisions that tend to inflate urban areas to gather more taxes. More importantly, I believe, is that these government-led statistics in Brazil and elsewhere estimate cash income but neglect subsistence income, that is, household reliance on local agricultural pro-

duction or environmental income (hunting, fishing, and gathering; Bharucha and Pretty 2010). Indeed, studies on the links between poverty and rural development have shown that environmental income constitutes, on average, 27.5% of total household income, a third of which is food (Angelsen et al. 2014), despite substantial variations depending on remoteness even across nearby locations (e.g., from 12% to 64%; Duchelle et al. 2014). Neglecting subsistence income thus has two drawbacks. It depicts a flawed picture of the rural poverty situation, since households with equivalent levels of cash income but contrasting access to local food may diverge substantially. Additionally, data relating only to cash income do not inform whether increased access to cash drives the replacement of local natural resources for purchased products. If so, CCTs could, in certain remote contexts, represent a Trojan horse because they may threaten food sovereignty in the long term.

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What Piperata, McSweeney, and Murrieta have done here is innovative and important—they provide a great model for how biocultural approaches can be directed at policy analysis. By employing the biocultural strategy of theory-driven and extremely rigorous data collection and analysis, they move well beyond basic pattern recognition to demonstrate the implications of testing whether on-the-ground policies are working as they are intended to do.

For us, the paper is a compelling call to arms. Like many other CA readers, we work in communities where development efforts are all around us. We get to see the effects of poorly conceived and poorly tested projects play out over time. And the unfortunate reality is that anthropologists do not easily get to the table at the policy design phase. We should, but it is not often possible even when we try really, really hard (see Pelletier's 2015 discussion of years of effort engaging global nutrition policy). But, we can more easily elbow in at the monitoring and evaluation phase—as Piperata and colleagues have done here. And we think that is the key to change: the realization that we cannot wait to be invited to the table. This article provides a clear model for how we can insert ourselves into policy conversations in ways that are theoretically justified and morally comfortable and actually have some possibility of positive influence.

If, as we believe, direct policy engagement is a next and necessary frontier for making our research matter for the communities with whom we collaborate, then it is important to ask: what types of information are most useful to inform decision making in the policy realm? This is a real challenge for biocultural anthropologists because of the gold standards for highly rigorous data collection across multiple domains, in-

cluding valid and reliable biomarkers. This mode of research is especially time-consuming and expensive, but that is what is needed to properly test scientific hypotheses explaining variations in human biology.

We would suggest, probably with some understandable pushback from our colleagues, that clear and compelling—but fundamentally basic—pattern identification relevant to policy evaluation may be sufficient for many policy decision makers. We can more cheaply and easily deploy a suite of methods fully outside the biological domain, and these can be inserted into a biocultural project easily for the purpose of informing policy. For example, policy makers may not need validated culturally specific food security scales that meet peer-review standards. They may be satisfied with data derived from simple interviews that explore “How has the food you eat changed in the last few years?” and “Do you have enough to eat?” Similarly, other tools that provide meaningful results quickly and cheaply include cultural consensus analysis to identify culturally agreed-upon understandings of causality, trends, and patterning and semantic network analysis to extract hidden associations and networks of meaning from a range of textual forms. Crucially, this can include social media and messaging. These approaches, while less scientifically conclusive than those used by Piperata and colleagues, provide a lower-bar entry point for initiating the types of policy interventions the authors call for in their paper's conclusion.

Next, can we better leverage our relationships with those sectors of society best placed to propagate our findings—and to determine whether these findings are ones that society wants and needs to act on? As noted, this goal requires us at times to act against our own professional interests. But study communities benefit when anthropologists build long-standing collaborations with the agencies and actors who create and implement the policies that affect them. This requires building trust with decision makers so that they allow us to see the reasoning underlying their decisions and to participate, even if only in marginal ways, in decision making. This is tough for biocultural anthropologists—perhaps because they are often already thinly stretched between field and lab. Better examples currently come from other parts of our field, such as environmental anthropology, where the tasks of data collection and relationship building tend to dovetail more easily. This is why the model that Piperata and colleagues' paper provides is so important.

Another pathway is building relationships with media gatekeepers. For example, journalists have access to a wide range of stakeholders and publicize our findings in a way that can directly influence policy. Paleoanthropology clearly gets this general principle, but they have the benefit of a “discovery” orientation that facilitates press coverage. In fields such as biocultural anthropology, where knowledge production tends to be cumulative, this is more of a challenge. Katie Hinde's work on the biology of breast milk is a stellar example of using social media to create and maintain excitement around biocultural knowledge in ways that can influence policy (<http://>



mammalsuck.blogspot.com). Maintaining such media presence is not practical or comfortable for everyone, though, and effective professional associations can reduce some of the start-up or sunk costs. This is one of the reasons that we are so happy to see Ed Liebow paying keen attention to this in his role as executive director of the American Anthropological Association. Other modes of outreach that coexist more easily with slower modes of scholarship and dissemination include museum exhibitions, K–12 curriculum development, and citizen science. Importantly, this all requires anthropology programs to emphasize and reward such activities as part of a normal and expected part of professional activities, such as in tenure criteria.

Biocultural anthropologists have so much to contribute to policy discussions, as this article shows. But we may need to extend ourselves a little. We need to get media training, write press releases, lobby professional organizations, write blogs, propose museum exhibits, and revise our departmental tenure criteria. And, perhaps most importantly, we need to let our colleagues who do engage policy decision makers know that we recognize why it is so very important. We suspect the future of our discipline depends on it. So, thank you, Piperata, McSweeney, and Murrieta, for leading the way.

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## Reply

*If by the end of my term of office every Brazilian has enough food to eat three times a day, I shall have fulfilled my mission in life.* (Luiz Inácio “Lula” da Silva, 2003 inaugural address)

As we prepare these final remarks, we find Brazil far from the heady days when Lula was first elected. Today, the country is anxiously anticipating its role as the host of the Olympic Games, the first to be held on the South American continent, while at the same time it is in a state of political and economic turmoil. The country’s first female president, Dilma Rousseff, is under impeachment for budgetary mismanagement, and there is heated political debate regarding public spending, including on poverty-alleviation programs. It is in light of these events that we respond to the welcome commentaries of our colleagues, with emphasis on two central issues. First, we consider the future of the Bolsa Família Program (BFP), its evaluation, and its potential to address hunger for Brazil’s poorest. Second, we further contemplate the role of anthropologists in poverty alleviation/health/food policy development, evaluation, and debate.

In a political landscape dominated by uncertainty, it is noteworthy that despite enormous pressure to reduce public spending, the current Brazilian administration has effectively

doubled down on its commitment to protect and even expand the cash transfer portion of the BFP (Reverbel et al. 2016). This move speaks loudly to the program’s popularity and reach (46 million people, 25% of the population), which makes any serious discussion of cutting the program tantamount to political suicide (Leahy 2016). However, while the cash transfer portion appears to be protected, the administration has been more circumspect in its willingness to spend on the complementary educational and public health infrastructure that is required to support the program’s conditionalities and that is fundamental to any effort to break the intergenerational cycle of poverty. Moreover, future independent in-country monitoring and evaluation of the program is at serious risk, given the administration’s decision to dramatically reduce the budgets of the federally funded universities and research centers who formerly fulfilled this oversight role (Gibney 2015). Thus, there is much uncertainty about how Bolsa Família, as a program, will function in the coming years and who will document and critique its impact on the country’s most impoverished citizens.

These uncertainties are especially concerning for the north (Amazon), which lags well behind the rest of the country in terms of social service infrastructure and basic indices of development. Adams, Brondizio, and Chernela make clear that the precarious state of education, sanitation, and public health provision is not unique to our study site but in fact characteristic of the rural Amazon. Like us, all three question how the BFP will ever end hunger and dismantle poverty traps in the absence of increased investment in these rudimentary services. Importantly, Brondizio reminds us that this lack of basic infrastructure is not limited to rural communities. Many Amazonian towns and cities are already ill-equipped to deal with their large populations, let alone provide the educational and health services required to fulfill the ongoing conditionality requirements of rural BFP recipients. This pressure is likely to grow. As our data suggest and as Chernela and Brondizio confirm, shifts in cultural values and desires and disruptions in local food production—stimulated in part by the BFP—combined with a continued lack of economic opportunities in rural communities, have increased the social and economic dependency of rural residents on urban zones and their resources. Assuming that the current budget crisis will only exacerbate the inadequate social services in Amazonian cities, a bare-bones, cash-only version of the BFP risks leading the region’s poorest citizens deeper into destitution rather than giving them the proverbial leg up that the program is meant to provide.

This gloomy scenario is not necessarily inevitable. It is possible to imagine that a stripped-down BFP bureaucracy would welcome ways to improve the targeting and effectiveness of cash transfers, particularly in areas where there is growing evidence that the strategy is arguably doing more harm than good. But such a scenario implies contemplation of several issues that get to the heart of how anthropologists might best support projects intended to improve the lot of populations whose misery we are so good at documenting.

First, it raises the issue of just what “evidence-based” policy means and for whom. As much as we are encouraged to believe we live in a world awash in big data, those data are spatially concentrated. Many parts of the world remain data deserts, as the dearth of data on Amazonian populations’ basic health and nutrition reminds us. After all, no single database has yet assembled the information needed to evaluate the BFP’s success in reaching its stated goals, a point also raised by Morcello. In fact, we remain unable to confidently assess whether Lula’s “three-meal-a-day” dream has even been reached. This is because existing databases vary in coverage, sampling strategy, and representativeness, as well as in their degree of public access. Nowhere is it harder to access data on programmatic outcomes than in the north. Logistical constraints and possible lack of political will have resulted in the absence of baseline data and gaps in coverage—especially in rural zones.

In such cases—when governments lack the political will and/or resources to generate high-quality, reliable data on their most impoverished populations—then the international scholarly community, especially those researchers who have built their careers studying such populations, bears an intellectual if not moral responsibility to ensure that any relevant data collected are made accessible and available to policy makers. It is thus critical that we present our work in public fora, as we are able, within the research and policy communities of the countries in which we work, as well as publish in the local language. Disseminating those findings, and putting pressure on policy makers to respond to them, is arguably best left to the many organizations already dedicated to such work and who often welcome new evidence with which to better advocate for particular populations. In fact, Adams provides some promising examples of such political entities within Amazonia.

Even this moderate level of engagement, however, requires a thick skin. Our recent experiences presenting the current study in Brazil (see Alves 2015) was met with some resistance from those academics who politically aligned with the left and who equated any critique of the BFP with that of the political party that instituted it. Others seemed to be irritated by a foreign scholar’s critique of a beloved national program for which Brazil has much cause to be proud. Conversely, some readers of the Brazilian media’s coverage of the research used it as an opportunity to belittle the work of Brazilian researchers.

We cannot, of course, control how our work is interpreted—by whom or with what intentions. What we can do, however, is ensure that we deploy the best—and only—defense we should ever need: that we did the most rigorous, transparent, and ethical study that we could using the most cutting-edge concepts and methodologies at our disposal and that we were as honest about what we learned from it (and what we did not) as we were able. In other words: that we did the science right.

We therefore agree with and appreciate Wutich’s and Brewis’s assertions that we, as social scientists, could and should expand our efforts to broadly disseminate our research findings and engage with policy and other nonacademic audiences. However, we are hesitant to advocate for altering our meth-

odological approach in an effort to be more flexible and responsive to policy contexts. While well intentioned, this could arguably open anthropologists up to the legitimate complaint that we are not, in fact, policy analysts. Our job is—first and foremost—to ask compelling, intellectually challenging questions about the world. The methodological and conceptual tools we choose must be driven by scientific questions, not policy expediency. This is not despite the fact that our research is often policy relevant—that real people could be (in)directly impacted by our findings—but because of it. If, for example, two years are required to ensure longitudinal rigor in a given analysis, we must trust that the science—and the insights we can offer policy makers from it—will only be better for it.

There are certainly plenty of scientifically intriguing questions that remain to be answered before making any responsible policy recommendations regarding the BFP in Amazonia or similar cash transfer programs in analogous rural regions. In addition to the challenges in basic program evaluation, Hicks draws attention to a number of interesting and important questions regarding the BFP that remain unanswered. Her commentary highlights the potential strength anthropology can have when it draws on its interdisciplinary roots and flexes its holistic muscle. We readily acknowledge the strong emphasis on human biology in our work. While our research provided us with data well suited for addressing the effect of the BFP on food security and health, it did not allow us to explore topics such as how engagement with the program altered the aspirations and desires of youth—the ultimate targets of the program. We were also limited in our ability to fully document mothers’ experiences with the program, including how they managed meeting the program’s conditionalities and the degree to which they adopted the associated neoliberal ideology that it is ultimately the task of individuals to overcome their poverty. Finally, our work raised serious questions regarding the role of the program in further stimulating rural-urban migration, a topic that requires more detailed attention. Such questions would be better addressed with the perspectives and methods of colleagues in cultural anthropology, geography, and political science. Thus, we hope this work acts to stimulate collaborative research efforts within our field as well as with colleagues in other disciplines.

Ultimately, perhaps our greatest challenge is to be aware of the partial and marginal nature of any contribution we may make to policies that are as deeply structurally flawed as is the BFP. Our colleagues’ comments make clear that they share (at least some of) our skepticism about the effectiveness of any program that aspires to reduce hunger and overcome poverty traps primarily by increasing rural folks’ access to cash. We therefore encourage and support the complementary work of other colleagues, especially those working within political-economy traditions, who draw much-needed attention to the ways in which rural poverty is historically produced and maintained through particular configurations of global political-economic power (e.g., Guedes et al. 2012; Saad-Filho 2015).

In sum: there are many fronts on which anthropologists can contribute to struggles to improve the well-being of those we study. No approach need be privileged—each is necessary, as is a collective commitment to mobilize our intellectual insights within and beyond academia.

—Barbara Ann Piperata, Kendra McSweeney,  
and Rui Sergio Murrieta

## References Cited

- Adams, Cristina, Rui Murrieta, and Walter Neves. 2009. Introduction. In *Amazon peasant societies in a changing environment: political ecology, invisibility and modernity in the rainforest*. Cristina Adams, Rui Murrieta, Walter Neves, and Mark Harris, eds. Pp. 1–20. Dordrecht: Springer.
- Adato, Michelle, and John Hoddinott. 2010. Conditional cash transfer programs: a “magic bullet” for reducing poverty? In *The poorest and hungriest: assessments, analyses and actions*. Joachim Von Braun, Ruth Hill, and Rajul Pandya-Lorch, eds. Pp. 299–306. Washington, DC: International Food Policy Research Institute.
- Alves, Gabriel. 2015. Na Amazônia, Bolsa Família causa “efeito mortadela” entre ribeirinhos. *Folha de Sao Paulo*, November 19, ciência sec. <http://www1.folha.uol.com.br/ciencia/2015/11/1708299-na-amazonia-bolsa-familia-causa-efeito-mortadela-entre-ribeirinhos.shtml>.
- Amaral, Ernesto Friedrich de Lima, and Vinícius do Prado Monteiro. 2013. Avaliação do impacto das condicionalidades de educação do Programa Bolsa Família (2005 e 2009). *Revista de Ciência e Sociedade* 56:531–570.
- Andrade, Mônica Viegas, Flávia Chein, Rafael Perez Ribas, and Jaume Puig-Junoy. 2013. Income transfer policies and nutritional condition of children: an evaluation of “Bolsa Família.” *Revista Econômica* 15(2):84–110. [CM]
- Angelsen, Arild, Pamela Jagger, Ronnie Babigumira, Brian Belcher, Nicholas J. Hogarth, Simone Bauch, Jan Börner, Carsten Smith-Hall, and Sven Wunder. 2014. Environmental income and rural livelihoods: a global-comparative analysis. *World Development* 64(11):S12–S28. [CM]
- Ansell, Aaron. 2014. *Zero hunger and anti-poverty policy in northeast Brazil*. Chapel Hill: University of North Carolina Press.
- Attanasio, Orazio P., Veruska Oppedisano, and Marcos Vera-Hernández. 2015. Should cash transfers be conditional? conditionality, preventive care, and health outcomes. *American Economic Journal: Applied Economics* 7(2):35–52. [CM]
- Barrientos, Armando. 2012. Social transfers and growth: what do we know? what do we need to find out? *World Development* 40:11–20.
- Barth, J. 2006. Public policy management councils in Brazil: how far does institutionalised participation reach? *Public Administration and Development* 26:253–263. [CA]
- Beduschi Filho, L. C., and R. Abramovay. 2004. Desafios para o desenvolvimento das regiões rurais. *Nova Economia, Belo Horizonte* 14(3):35–70. [CA]
- Bharucha, Zareen, and Jules Pretty. 2010. The roles and values of wild foods in agricultural systems. *Philosophical Transactions: Biological Sciences* 365(1554):2913–2926. [CM]
- Börner, J., S. Wunder, F. Reimer, R. K. Bakkegaard, V. Viana, J. Tezza, T. Pinto, L. Lima, and S. Marostica. 2013. *Promoting forest stewardship in the Bolsa Floresta Programme: local livelihood strategies and preliminary impacts*. Rio de Janeiro, Brazil: Center for International Forestry Research. [CA]
- Brewis, Alexandra, and James McKenna. 2015. Translating human biology. *American Journal of Human Biology* 27:1–5.
- Brondizio, E. S., N. Vogt, and A. Siqueira. 2013. Forest resources, city services: globalization, household networks, and urbanization in the Amazon estuary. In *The social life of forests*. K. Morrison, S. Hetch, and C. Padoch, eds. Pp. 348–361. Chicago: University of Chicago Press. [ESB]
- Brondizio, Eduardo. 2008. *The Amazonian Caboclo and the açaí palm: forest farmers in the global market*. Bronx: New York Botanical Garden Press.
- . 2011. Forest resources, family networks and the municipal disconnect: examining recurrent underdevelopment in the Amazon estuary. In *The Amazon Várzea: the decade past and the decade ahead*. Miguel Pinedo-Vasquez, Mauro Ruffino, Christine Padoch, and Eduardo Brondizio, eds. Pp. 207–229. Dordrecht: Springer.
- Bullock, Allison, and Brian King. 2011. Evaluating China’s slope land conversion program as sustainable management in Tianquan and Wuqi Counties. *Journal of Environmental Management* 92:1916–1922. [CA]
- Bunker, Stephen. 1985. *Underdeveloping the Amazon: extraction, unequal exchange, and the failure of the modern state*. Chicago: University of Chicago Press.
- Cabral, Caroline, Amanda Lopes, Johnnatas Lopes, and Rodrigo Pinheiro de Toledo Vianna. 2014. Segurança alimentar, renda e Programa Bolsa Família: estudo de coorte em municípios do interior da Paraíba, Brasil, 2005–2011. *Caderno de Saúde Pública* 30:393–402.
- Cardoso, Luis, and Jaime Souza. 2011. Living, learning and working: *habitus* and socialization of children in an Amazonian fishing community. *Boletim do Museu Paraense Emílio Goeldi. Ciências Humanas* 6:165–177.
- CEDEPLAR. 2007. *Avaliação de impacto do Programa Bolsa Família*. Belo Horizonte: Centro de Desenvolvimento e Planejamento Regional.
- Chilton, Mariana, Michelle Chyatte, and Jennifer Breaux. 2007. The negative effects of poverty and food insecurity on child development. *Indian Journal of Medical Research* 126:262–272.
- Coimbra, C. E. A., Jr., R. V. Santos, J. R. Welch, A. M. Cardoso, M. C. de Souza, L. Garnelo, E. Rassi, M.-L. Follér, and B. L. Horta. 2013. The First National Survey of Indigenous People’s Health and Nutrition in Brazil: rationale, methodology, and overview of results. *BMC Public Health* 13:52. <http://www.biomedcentral.com/1471-2458/13/52>. [CA]
- Cotta, Rosângela, and Juliana Machado. 2013. Programa Bolsa Família e segurança alimentar e nutricional no Brasil: Revisão crítica da literatura. *Revista Panamericana de Salud Publica* 33:54–60.
- Cotta, Rosângela Minardi Mitre, Fabiana de Cássia Carvalho Oliveira, Kelly Alves Magalhães, Andréia Queiroz Ribeiro, Luciana Ferreira da Rocha Sant’Ana, Sílvia Eloíza Priore, and Sílvia do Carmo Castro Franceschini. 2011. Social and biological determinants of iron deficiency anemia. *Cadernos de Saúde Pública* 27:s309–s320. [CM]
- de Bem Lignani, Juliana, Rosely Sichieri, Luciene Burlandy, and Rosana Salles-Costa. 2010. Changes in food consumption among the Programa Bolsa Família families in Brazil. *Public Health Nutrition* 14:785–792.
- de Brauw, Alan, Daniel Gilligan, John Hoddinott, and Shalini Roy. 2014. The impact of Bolsa Família on women’s decision-making power. *World Development* 59:487–504.
- Democracy Now. 2016. Brazil: protests held to defend gov’t amid accusations of right-wing “coup.” [http://www.democracynow.org/2016/3/21/headlines/brazil\\_protests\\_held\\_to\\_defend\\_govt\\_amid\\_accusations\\_of\\_right\\_wing\\_coup](http://www.democracynow.org/2016/3/21/headlines/brazil_protests_held_to_defend_govt_amid_accusations_of_right_wing_coup) (accessed March 30, 2016). [KAH]
- DeSouza, S. I., M. R. Rashmi, A. P. Vasanthi, S. M. Joseph, and R. Rodrigues. 2014. Mobile phones: the next step towards healthcare delivery in rural India? *PLoS ONE* 9(8):e104895. doi:10.1371/journal.pone.0104895. [CA]
- de Souza-Lago, Mara, and João-Mateus Dallman. 2012. A importância da etnografia nas pesquisas interdisciplinares: uma abordagem para o estudo do Programa Bolsa Família em Florianópolis, SC. *Cadernos de Pesquisa Indersdisciplinar em Ciências Humanas* 13:60–78.
- Duarte, Gisléia Benini, Breno Sampaio, and Yony Sampaio. 2009. Programa Bolsa Família: impacto das transferências sobre os gastos com alimentos em famílias rurais. *Revista de Economia e Sociologia Rural* 47:903–918.
- Duchelle, Amy E., Angélica M. Almeyda Zambrano, Sven Wunder, Jan Börner, and Karen A. Kainer. 2014. Smallholder specialization strategies along the forest transition curve in southwestern Amazonia. *World Development* 64 (suppl. 1):S149–S158. [CM]
- Dufour, Darna, and Barbara Piperata. 2004. Rural-to-urban migration in Latin America: an update and thoughts on the model. *American Journal of Human Biology* 16:395–404.
- ECLAC (United Nations Economic Commission for Latin America and the Caribbean). 2008. *Statistical yearbook for Latin America and the Caribbean*. New York: ECLAC. [JC]
- Eloy, Ludivine, Eduardo Brondizio, and Rogerio do Pateo. 2015. New perspectives on mobility, urbanization and resource management in riverine Amazonia. *Bulletin of Latin American Research* 34:3–18.
- FAO. 2009. *State of food security in the world*. Rome: United Nations.
- Frisancho, A. Roberto. 2008. *Anthropometric standards: an interactive nutritional reference of body size and body composition for children and adults*. Ann Arbor: University of Michigan Press.
- García, Marito, and Charity Moore. 2012. *The cash dividend: the rise of cash transfer programs in Sub-Saharan Africa*. Washington, DC: World Bank.
- Gertler, Paul. 2004. Do conditional cash transfers improve child health? evidence from PROGRESA’s control randomized experiment. *Health, Health Care, and Economic Development* 94:336–341.
- Gibney, Elizabeth. 2015. Brazilian science paralysed by economic slump. *Nature* 526:16–17. <http://www.nature.com/news/brazilian-science-paralysed-by-economic-s slump-1.18458>.

- Gibson, Roselyn. 1990. *Principles of nutritional assessment*. New York: Oxford University Press.
- Godoy, R., V. Reys-García, E. Byron, W. R. Leonard, and V. Vadez. 2005. The effect of market economies on the well-being of indigenous peoples and their use of renewable resources. *Annual Review of Anthropology* 34:121–138. [CM]
- Guanais, Frederico. 2013. The combined effects of the expansion of primary health care and conditional cash transfers on infant mortality in Brazil, 1998–2010. *American Journal of Public Health* 103:2000–2006.
- Guedes, Gilvan R., Eduardo S. Bronndizio, Alisson F. Barbieri, Resende Anne, Rodrigo Penna-Firme, and Álvaro D'Antona. 2012. Poverty and inequality in the rural Brazilian Amazon: a multidimensional approach. *Human Ecology* 40(1):41–57.
- Hall, Anthony. 2006. From Fome Zero to Bolsa Família: social policies and poverty alleviation under Lula. *Journal of Latin American Studies* 38:689–709.
- . 2008. Brazil's Bolsa Família: a double-edged sword? *Development and Change* 39:799–822.
- Handa, Sudhanshu, and Benjamin Davis. 2006. The experience of conditional cash transfers in Latin America and the Caribbean. *Development Policy Review* 24:513–536.
- Hicks, Katherine, and William Leonard. 2014. Developmental systems and inequality: linking evolutionary and political-economic theory in biological anthropology. *Current Anthropology* 55:523–550.
- Hoddinott, John. 2010. Nutrition and conditional cash transfer programs. In *Conditional cash transfers in Latin America*. Michelle Adato and John Hoddinott, eds. Pp. 231–257. Washington, DC: International Food Policy Research Institute.
- Hoddinott, John, Emmanuel Skoufias, and Ryan Washburn. 2000. The impact of PROGRESA on consumption: a final report. Washington, DC: International Food Policy Research Institute.
- IBGE (Instituto Brasileiro de Geografia e Estatística). 2010. *Sinopse de censo demográfico*. Rio de Janeiro: IBGE.
- . 2014. Estatísticas de Gênero. *Uma análise dos resultados do Censo Demográfico 2010*. Informação Demográfica e Socioeconômica 33. Brasília: Instituto Brasileiro de Geografia e Estatística. [CA]
- . 2015. *Os Censos Demográficos no Brasil*. Rio de Janeiro: IBGE. <http://www.cidades.ibge.gov.br/xtras/home.php>. Accessed April 3, 2015. [JC]
- IFAD (International Fund for Agricultural Development). 2008. *Rural poverty in Brazil*. <http://www.ruralpovertyportal.org/english/regions/americas/brazil/index.htm>. Accessed March 6, 2015. [JC]
- Hecht, Susan. 2014. Forests lost and found in tropical Latin America: the woodland “green revolution.” *Journal of Peasant Studies* 4:877–909.
- Jaime, Patricia, Alexander Vaz, Eduardo Nilson, Júlio Fonseca, Simone Guadagnin, Sara da Silva, Marconi de Sousa, and Leonor Santos. 2014. Desnutrição em crianças de até cinco anos beneficiárias do programa Bolsa Família: Análise transversal e painel longitudinal de 2008 a 2012. In *Cadernos de Estudos Desenvolvimento Social em Debate* 17. Brasília: Ministério do Desenvolvimento Social e Combate à Fome.
- Kakwani, Nanak, Fábio Soares, and Hyun Son. 2005. *Conditional cash transfers in African countries*. Working Paper 9. Brasília: UN Development Programme, International Poverty Center.
- Kerstenetzky, Celia. 2009. Redistribuição e desenvolvimento? a economia política do Programa Bolsa Família. *Revista de Ciências Sociais* 52:53–83.
- Kuzawa, Christopher. 2005. Fetal origins of developmental plasticity: are fetal cues reliable predictors of future nutritional environments? *American Journal of Human Biology* 17:5–21.
- Lagarde, Mylene, Andy Haines, and Natasha Palmer. 2007. Conditional cash transfers for improving uptake of health interventions in low- and middle-income countries. *Journal of the American Medical Association* 298:1900–1910.
- Lancy, David. 2015. Children as a reserve labor force. *Current Anthropology* 54:545–568.
- Leahy, Joel. 2016. Rouseff tours Brazil in final effort to stave off impeachment. *Financial Times*, May 8, world sec. <http://www.ft.com/cms/s/0/d20254d0-1333-11e6-bb40-c30e3bfc63b.html#axzz4C8Orx3Ex>.
- Leatherman, T. L. 1998. Illness, social relations, and household production and reproduction in the Andes of southern Peru. In *Building a new biocultural synthesis: political-economic perspectives on human biology*. A. H. Goodman and T. L. Leatherman, eds. Pp. 245–267. Ann Arbor: University of Michigan Press. [KAH]
- Leroy, Jef L., Paola Gadsden, Teresa González de Cossio, and Paul Gertler. 2013. Cash and in-kind transfers lead to excess weight gain in a population of women with a high prevalence of overweight in rural Mexico. *Journal of Nutrition* 143(3):378–383. [CM]
- Le Tourneau, F.-M. 2015. The sustainability challenges of indigenous territories in Brazil's Amazonia. *Current Opinion in Environmental Sustainability* 14:213–220. [CA]
- Lindert, Kathy, Anja Linder, Jason Hobbs, and Bénédicte de la Brière. 2007. *The nuts and bolts of Brazil's Bolsa Família program: implementing conditional cash transfers in a decentralized context*. Washington, DC: World Bank.
- Lu, Flora. 2007. Integration into the market among Indigenous peoples: a cross-cultural perspective from the Ecuadorian Amazon. *Current Anthropology* 48(4):593–602. [CM]
- Madeiros da Fonseca, Ana Maria, and Ana Luzia d'Ávila Viana. 2007. Direito à saúde, atenção básica e transferências condicionadas de renda na América Latina. *Ciência e Saúde Coletiva* 12:1505–1512.
- Mansur, Addressa V., Eduardo S. Bronndizio, Samapriya Roy, Scott Hetrick, Nathan D. Vogt, and Alice Newton. 2016. An assessment of urban vulnerability in the Amazon Delta and Estuary: a multi-criterion index of flood exposure, socio-economic conditions and infrastructure. *Sustainability Sciences* 11:1–16. doi:10.1007/s11625-016-0355-7. [ESB]
- Marshall, Caroline, and Peter Hill. 2014. Ten best resources on conditional cash transfers. *Health Policy Planning* 2014:1–5.
- Martins, Ana Paula, Daniela Canella, Larissa Baraldi, and Carlos Monteiro. 2013. Cash transfers in Brazil and nutritional outcomes: a systematic review. *Revista de Saúde Pública* 47:1–12.
- Melgar-Quinonez, Hugo, Mark Nord, Rafael Perez-Escamilla, and AnaMaria Segall-Correa. 2008. Psychometric properties of a modified US-household food security survey module in Campinas, Brazil. *European Journal of Clinical Nutrition* 62:665–673.
- Miller, Candace, Maxton Tsoka, and Kathryn Reichert. 2011. The impact of the Social Cash Transfer Scheme on food security in Malawi. *Food Policy* 36:230–238.
- Moran, Emilio. 1981. *Developing the Amazon*. Bloomington: University of Indiana Press.
- Murrieta, Rui. 2001. Dialética do sabor: alimentação, ecologia e vida cotidiana em comunidades Ribeirinhas da Ilha de Ituqui, Baixo Amazonas, Pará. *Revista de Antropologia* 44:39–88.
- Murrieta Rui, Maissa Bakri, Cristina Adams, Perpetua Souza, and Roberto Strumpf. 2008. Consumo alimentar e ecologia de populações Ribeirinhas em ecossistemas Amazônicos: um estudo comparativo. *Revista de Nutrição da POCSCAMP* 21:123–134.
- Nardoto, G. B., R. S. S. Murrieta, L. E. G. Prates, C. Adams, M. E. P. E. Garavello, T. Schor, A. de Moraes, et al. 2011. Frozen chicken for wild fish: nutritional transition in the Brazilian Amazon region determined by carbon and nitrogen stable isotope ratios in fingernails. *American Journal of Human Biology* 23:642–650. <http://dx.doi.org/10.1002/ajhb.21192>. [CA]
- Nasuti, Stephanie, Ludivine Eloy, Celine Raimbert, and François-Michele Le Tourneau. 2015. Can rural-urban household mobility indicate differences in resource management within Amazonian communities? *Bulletin of Latin American Research* 34:35–52.
- Nugent, Stephen. 1993. *Amazon Caboclo society: an essay on invisibility and peasant economy*. Providence, RI: Berg.
- Ostrom, Elinor. 1999. Coping with tragedies of the commons. *Annual Review of Political Science* 2:493–535. [CA]
- Pace, Richard, and Brian Hinote. 2013. *Amazon TV town: an audience ethnography in Gurupá, Brazil*. Austin: University of Texas Press.
- Padoch, Christine, Eduardo Bronndizio, Sandra Costa, Miguel Pinedo-Vasquez, Robin Sears, and Andrea Siquiera. 2008. Urban forests and rural cities: multi-sited households, consumption patterns, and forest resources in Amazonia. *Ecology and Society* 13:2.
- Paes-Sousa, Rômulo, Leonor Pacheco-Santos, and Edina Shisue-Miazaki. 2011. Effects of a conditional cash transfer program on child nutrition in Brazil. *Bulletin of the World Health Organization* 89:496–503.
- Parsons, Kênia Hatsue Silva. 2010. *Conditional cash transfers and rural poverty: analysis of the Bolsa Família programme*. Brasília: International Policy Centre. [JC]
- Pelletier, David. 2015. Food and nutrition policy: a biological anthropologist's experiences from an academic platform. *American Journal of Human Biology* 27(1):16–26. [AW/AB]
- Pinstrup-Andersen, Per. 2009. Food security: definition and measurement. *Food Security* 1:5–7.
- Piperata, Barbara. 2007. Nutritional status of Ribeirinhos in Brazil and the nutrition transition. *American Journal of Physical Anthropology* 133:868–878.
- Piperata, Barbara, and Darna Dufour. 2007. Diet, energy expenditure, and body composition of lactating Ribeirinha women in the Brazilian Amazon. *American Journal of Human Biology* 19:722–734.

- Piperata, Barbara, Sofia Ivanova, Pedro da Gloria, Gonçalo Veiga, Analise Polsky, Jennifer Spence, and Rui Murrieta. 2011a. Nutrition in transition: dietary patterns of Amazonian women during a period of economic change. *American Journal of Human Biology* 23:458–469.
- Piperata, Barbara, Kammi Schmeer, Craig Hadley, and Genevieve Ritchie-Ewing. 2013. Dietary inequalities of mother-child pairs in the rural Amazon: evidence of maternal-child buffering? *Social Science and Medicine* 96:183–191.
- Piperata, Barbara, Jennifer Spence, Pedro da Gloria, and Mark Hubbe. 2011b. The nutrition transition in Amazonia: rapid economic change and its impact on growth and development in Ribeirinhos. *American Journal of Physical Anthropology* 146:1–13.
- PNUD. 2013. *O Índice do Desenvolvimento Humano Municipal Brasileiro*. Brasília: PNUD.
- Radcliffe, S. A. 2011. Development for a postneoliberal era? *sumak kawsay*, living well and the limits to decolonisation in Ecuador. *Geoforum* 43:240–249. [KAH]
- Rasella, Davide, Rosana Aquino, Carlos Santos, Rômulo Paes-Sousa, and Mauricio Barreto. 2013. Effect of a conditional cash transfer programme on childhood mortality: a nationwide analysis of Brazilian municipalities. *Lancet* 382:57–64.
- Reis, Mauricio. 2010. Cash transfer programs and child health in Brazil. *Economic Letters* 108:22–25.
- Reverbel, Paula, Tássia Kastner, Gustavo Uribe, and Valdo Cruz. 2016. Perto de votação decisiva, presidente divulga readjuste de Bolsa Família e IR. *Folha de Sao Paulo*, May 1, poder sec. <http://www1.folha.uol.com.br/internacional/en/brazil/2016/05/1766848-with-final-vote-date-approaching-rousseff-announces-kindness-package-and-challenges-temer.shtml>.
- Ridell, Roger. 2004. Approaches to poverty: a note from the “development” perspective. Working Paper. Geneva: International Council of Human Rights Policy.
- Rizek, Maytê, and Carla Morsello. 2012. Impacts of trade in non-timber forest products on cooperation among Caboclo households of the Brazilian Amazon. *Human Ecology* 40:707–719.
- Robbins, Alicia S. T., and Stevan Harrell. 2014. Paradoxes and challenges for China’s forests in the Reform Era. *China Quarterly* 218:381–403. [CA]
- Saad-Filho, Alfredo. 2015. Social policy for neoliberalism: the Bolsa Família programme in Brazil. *Development and Change* 46:1227–1242.
- Saldiva, Sílvia, Luiz Silva, and Paulo Saldiva. 2010. Avaliação antropométrica e consumo alimentar em crianças menores de cinco anos residentes em um município da região do semiárido nordestino com cobertura parcial do Programa Bolsa Família. *Revista de Nutrição* 23(2):221–229.
- Sánchez-Ancochea, Diego, and Lauro Mattei. 2011. Bolsa Família, poverty and inequality: political and economic effects in the short and long run. *Global Social Policy* 11:299–318.
- Sarti, F. M., C. Adams, C. Morsello, N. van Vliet, T. Schor, B. Yagüe, L. Tellez, M. Quiceno-Mesa, and D. Cruz. 2015. Beyond protein intake: bushmeat as source of micronutrients in the Amazon. *Ecology and Society* 20(4):22. <http://dx.doi.org/10.5751/ES-07934-200422>. [CA]
- Schubert, Bernd, and Rachel Slater. 2006. Social cash transfers in low-income African countries: conditional or unconditional? *Development Policy Review* 24:571–578.
- Silva, Hilton. 2009. Socio-ecology of health and disease: the effects of invisibility on the Caboclo populations of the Amazon. In *Amazon peasant societies in a changing environment: political ecology, invisibility and modernity in the rainforest*. Cristina Adams, Rui Murrieta, Walter Neves, and Mark Harris, eds. Pp. 307–333. Dordrecht: Springer.
- Smith, Lisa, Amani El Obeid, and Helen Jensen. 2000. The geography and causes of food insecurity in developing countries. *Agricultural Economics* 22:199–2015.
- Soares, Fábio, Rafael Ribas, and Rafael Osório. 2010. Evaluating the impact of Brazil’s Bolsa Família: cash transfer programs in comparative perspective. *Latin American Research Review* 45(2):173–190.
- Soares, Fábio Veras, Sergei Soares, Marcelo Medeiros, and Rafael Guerreiro Osório. 2006. *Cash transfer programmes in Brazil: impacts on inequality and poverty*. Working Paper 21. Brasília: International Poverty Centre, UNDP/IPEA. [CA]
- Steward, Angela. 2007. Nobody farms here anymore: livelihood diversification in the Amazonian community of Carvão, a historical perspective. *Agriculture and Human Values* 24:75–92.
- Teixeira, Clarissa, Fábio Veras Soares, Elydia Silva, and Guilherme Hirata. 2011. Qual é a Eficácia dos Componentes Não-monetários dos Programas de PTC? Brasília: International Poverty Centre, UNDP/IPEA. [CM]
- Todd, Jessica, Paul Winters, and Tom Hertz. 2010. Conditional cash transfers and agricultural production: lessons from the *Oportunidades* experience in Mexico. *Journal of Development Studies* 46:39–67.
- Van Vliet, N., M. P. Quiceno, D. Cruz, L. J. Neves de Aquino, B. Yagüe, T. Schor, S. Hernandez, and R. Nasi. 2015. Bushmeat networks link the forest to urban areas in the trifrontier region between Brazil, Colombia, and Peru. *Ecology and Society* 20(3):21. <http://dx.doi.org/10.5751/ES-07782-200321>. [CA]
- Victoria, C. G., M. L. Barreto, M. C. Leal, C. A. Monteiro, M. I. Schmidt, J. Paim, F. I. Bastos, et al., and the Lancet Brazil Series Working Group. 2011. Health conditions and health-policy innovations in Brazil: the way forward. *Lancet* 377:2042–2053. [CA]
- Vogt, Nathan D., Miguel Pinedo-Vasquez, Eduardo Brondizio, Oriana Almeida, and Sergio Rivero. 2015. Forest transitions in mosaic landscapes: smallholder’s flexibility in land-resource use decisions and livelihood strategies from World War II to the present in the Amazon estuary. *Society and Natural Resources* 28(10):1043–1058.
- Wang, Chunmei, and Virginia Maclaren. 2012. Evaluation of economic and social impacts of the sloping land conversion program: a case study in Dunhua County, China. *Forest Policy and Economics* 14:50–57. [CA]
- Weaver, Lesley Jo, and Craig Hadley. 2009. Moving beyond hunger and nutrition: a systematic review of the evidence linking food insecurity and mental health in developing countries. *Ecology of Food and Nutrition* 48:263–284.
- Weinstein, Barbara. 1983. *The Amazon rubber boom 1850–1920*. Stanford, CA: Stanford University Press.
- Wells, Jonathan C. K. 2012. Obesity as malnutrition: the role of capitalism in the obesity global epidemic. *American Journal of Human Biology* 24:261–276. [KAH]
- Wetzel, Deborah. 2013. Bolsa Família’s quiet revolution. <http://www.worldbank.org/en/news/opinion/2013/11/04/bolsa-familia-Brazil-quiet-revolution>. Accessed July 20, 2015.
- Wiedman, Dennis. 2012. Native American embodiment of the chronicities of modernity. *Medical Anthropology Quarterly* 26:595–612. [KAH]
- WinklerPrins, Antoinette, and Perpetua Souza. 2005. Surviving the city: urban home gardens and the economy of affection in the Brazilian Amazon. *Journal of Latin American Geography* 4:107–126.
- World Bank. 2003. *Rural poverty alleviation in Brazil: toward an integrated strategy*. Washington, DC: World Bank. [JC]
- . 2009. *Bolsa Família: changing the lives of millions in Brazil*. Washington, DC: World Bank. [JC]