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A Test of Conspicuous Consumption Among Native Amazonians in Bolivia:

Results of a Randomized Controlled Trial

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ABSTRACT

A long line of thinking from ancient Greco-Roman writers via Veblen to the present suggests that people invest in deluxe goods to enhance social status. The claim is intriguing but problematic owing to the endogeneity of income. We report results of a randomized-controlled trial in a native Amazonian society of forager-farmers in Bolivia (Tsimane') in which we transferred large amounts of in-kind income to villages selected at random. The transfer did not produce any changes in expenditure or consumption of goods with high levels of cultural visibility (e.g., luxury items). We discuss technical and substantive reasons for the null findings.

Keywords: Expenditure visibility; Preferences for status; Positional externalities; Status concerns.

Introduction. "Why do people spend as they do?" The question has roots in ethno-historical and contemporary examples of conspicuous consumption, namely people spending in goods to convey social status and identity. The ethno-historical record of early contact with Europeans is speckled with examples of North American Indians as discerning customers, who sometimes shunned metal tools and demanded instead glass beads of particular colors and shapes because those goods signaled cultural identity and social hierarchy (Axtell, 1995; C. L. Miller & Hamell, 1986; Snow, 1994). In economics, Veblen immortalized the idea of an "expenditure arms race" to buy positional goods as a way of showing off status (Bloch, Rao, & Desai, 2004; Frank, 2005; Veblen, 1899). Bourdieu (1984) shows that people accumulate "legitimate art" as an emblem of class, and cultural anthropologists have shown that people buy goods to signal their cultural, national, and demographic identity (Archambault, 2013; Douglas & Isherwood, 1996; Martínez, 2010; Orlove, 1997; Stalp, Williams, Lynch, & Radina, 2009). Expenditure preferences result from upbringing, social learning, and imitating the expenditures of people higher up in the social hierarchy (Bourdieu, 1984; Veblen, 1899). Together, these strands of evidence hint at the idea that consumption expenditure is both an individual and cultural act, a means of increasing personal utility, and a way of communicating with others in society (Heffetz & Frank, 2011a).

People signal through behaviors to convey identity (Orlove, 1997), emotions (Darwin, 1965 [orig. 1872]; Provine, Krosnowski, & Brocato, 2009), and to display status. Status is associated with core aspects of life, including economic well-being (Frank, 1985), good health (Sapolsky, 2005), preferential treatment (Veblen, 1899), and reproductive success (Miller, 2000; Newson, 2009). In small-scale, rural economies where production and consumption overlap, people equate status with reproductive potential because they consume what they produce and produce what they consume. They spend time and resources broadcasting their reproductive

potential by displaying their skills as providers of food (Bliege Bird, Smith, & Bird, 2001; Hawkes & Bliege Bird, 2002; Henrich & Gil-White, 2001; Holland Jones, Bliege Bird, & Bird, 2013). As economies grow in complexity, and as labor specialization deepens, production and consumption diverge, and people begin to signal their socioeconomic status through expenditure in positional goods (Bloch et al., 2004; Frank, 2005; Veblen, 1899). The need to signal status through expenditure in positional goods happens because status flows from the judgment and deference conferred by others. In interactions with anonymous strangers, others cannot observe one's income, wealth, or routine consumption, unless one takes steps to make them noticeable to (Bagwell & Bernheim, 1996; Glazer & Konrad, 1996). As Veblen (1899) put it, one's esteem depends only on evidence.

Assessing the importance of conspicuous consumption has been hard owing to the endogeneity of income. In response to a rise in income, people might increase expenditures in luxury goods, but both income and expenditures in positional goods might be driven by unobserved, un-measurable heterogeneity in endowments and tastes. Furthermore, goods that confer status change inline with their ubiquity. In Veblen's time over 100 years ago the affluent showed off their status through leisure, then they switched to luxury goods, such as cars and large houses (Frank, 2007), and with the mass production of deluxe goods, the affluent switched still again to new ways of getting noticed, including, ironically, conspicuous non-consumption or "reverse snobbery" (Thomas, 2007).

Some researchers working with data from industrial nations have developed indexes of cultural visibility of consumption – essentially how long it would take a person to notice the consumption of a good by someone else in a community – and have then gone on to regress expenditures against the index (Charles, Hurst, & Roussanov, 2009; Friehe & Mechtel, 2014;

Kaus, 2013). In the first studies, Heffetz (2011, 2012) found that the index of cultural visibility explained ~30% of the variation in monetary expenditures in the USA. Like income, indexes of cultural visibility are also affected by endogeneity. How fast one notices expenditures in positional goods of neighbors results from one's expenditures in those goods. In buying positional goods, one might sensitize oneself to spot the consumption of positional goods of others.

To overcome endogeneity biases, here we use data from a randomized controlled trial (RCT) in a horticultural-foraging society of the Bolivian Amazon, the Tsimane', in the early stages of continual exposure to the market. In the trial we allocated in-kind income to villages selected at random and monitored villager's expenditures. The trial took place in 40 villages, 470 households, and 2,052 adults who varied in market exposure and town proximity. In such a society, people might show off status through redistribution (Gurven, 2004; Hill & Hurtado, 1996), consumption of positional goods, or both. We test only whether exogenous infusions of in-kind income to households affected the probability of incurring monetary expenditures in the following types of goods: basic consumables (e.g., medicines, food), durable assets (e.g., tools), and luxuries or positional goods (e.g., jewelry, radios).

Evolutionary theory predicts that signaling by consumption should be more marked in more monetized economies. The theoretical and empirical work from economics predicts that increases in income should increase expenditure in positional goods more than in ordinary or inferior goods (Godoy et al., 2007). Thus, we hypothesize:

H1: Exogenous in-kind, income transfer in the pooled sample will not produce visible effects on expenditure in positional goods since the pooled sample includes both remote

communities where people display status through public behaviors such as sharing and distribution rather than through private expenditures, and more monetized communities where people display status through private monetary expenditure in deluxe goods.

H2: Exogenous in-kind income transfers will have a greater impact on the probability of incurring monetary expenditures in positional goods in ***(a)*** more monetized communities and ***(b)*** among goods that enjoy high cultural visibility.

The people. The latest (2012) Bolivian census puts the Tsimane' population over the age of 16 at 8,863, for a total population of 16,824 people (INE, 2014, 2014a). An unpublished estimate by the Tsimane' Council (their governing body) suggests that the Tsimane' live in 95 villages, totaling 2,755 households. Because much of their homeland lacked commercial resources (e.g., rubber) and because they lived in relatively inaccessible territory, Tsimane' were able to keep westernization at arm's length and remained relatively isolated until the 1970s, when roads brought outsiders into their territory (Huanca, 2008). Contact with the outside is limited to the sale of forest and farm goods and to work as seasonal laborers in logging camps, colonists' farms, and cattle ranches (Reyes-García & Huanca, 2014).

An average village has 22 households (standard deviation [SD] = 6.5), with 5.4 people per household, evenly split between females and males. Within a village, houses lie scattered with related families living around an open courtyard. Houses have four sides and, in remote villages, often lack walls. In villages closer to towns, people have built perimeter walls around their houses and installed locks on their doors; thus, goods inside the house are less likely to be seen by people on the outside. During a survey in 2002 of all households in 13 Tsimane' villages, we counted the number of outside walls of each house. We found that in remote villages houses

had an average of 2.5 walls (SD=1.6), but a quarter of houses had no walls. In villages closer to towns, houses had an average of 3.3 walls (SD=1.2), and only 9% of the houses had no walls. The ease of physical visibility is higher than these figures suggest because Tsimane' keep many durable goods in lean-to kitchens and 71% of such kitchens had no walls.

Subsistence centers on farming and foraging (Ringhofer, 2010). In 2009, mean daily monetary income per person was US$0.90 (SD=2.1), slightly above the threshold of extreme poverty used by the Bolivian Government (US$0.62) (World Bank, 2005). Village inequality in income and asset wealth is small owing to norms of sharing and reciprocity and to strong endogamic rules (Undurraga et al., 2010).

In 2004 we surveyed 161 Tsimane' women and 257 men over 16 years of age in the same 13 villages where we did the study of house construction described earlier, and found that higher total monetary expenditures was positively associated with the share of expenditures allocated to *physically* visible luxury durable goods (e.g., battery-operated radios) and was negatively associated with the share of expenditures allocated to *physically* less visible durable goods (e.g., toothbrushes) (Godoy et al., 2007). We grouped the goods people bought into the following categories: animals, clothing, kitchen, health and hygiene, luxury, school supplies, tools, and transport. The results are suggestive but are limited by the use of observational data. Also, we imposed our classificatory scheme on the goods people acquired and made arbitrary decisions about the physical (rather than the cultural) visibility of the goods.

In 2006, Heffetz adapted his index of cultural visibility from the USA to the Tsimane'. He asked a sample of 676 adults the following question: "If someone in the village was to buy/consume [….*name of good or activity*….], how long would it take before you found out?"

The question was posed for many goods and behaviors, with questions about different goods and behaviors asked in random order to avoid response bias from the order in which study participants heard the questions (Kahneman, Krueger, Schkade, Schwarz, & Stone, 2006). We ranked goods by their cultural visibility – how quickly one would notice the monetary expenditure or consumption of a particular good incurred by someone else in the village. Goods fell into three categories, including expenditure in goods with: (a) *high cultural visibility* (e.g., wild game meat; meat from domesticated animal), (b) *medium cultural visibility* (e.g., durable assets; luxury goods), and (c) *low cultural visibility* (e.g., area planted; forest area cleared for agriculture). Much of the empirical work that follows centers on goods and behaviors that fall under categories a-b.

Previous studies (Reyes-Garcia et al., 2008; Reyes-García et al., 2008) among the Tsimane' have measured status by asking about "the most important people in the village" or asking about dimensions such as respect and fighting prowess (Von Rueden, Gurven, & Kaplan, 2008) rather than asking about economic status. These studies found that status tends to be positively associated with anthropometric indicators of nutritional status and social support.

Methods and analysis

Data and treatments. We used data from a RCT that assessed the effects of a one-time, unconditional in-kind income transfer on various indicators of individual well-being, including consumption and monetary expenditures. The trial had two treatments (Figure 1). In treatment 1 (T_1) all households in the village received the transfer and in treatment 2 (T_2) only the poorest 20% of households in a village received the transfer. Households in the top 80% of the income distribution in T_2 villages, and all households in the control villages received improved rice

seeds.[1] Randomization was done at the village level to assess the impact of transfers on the entire local economy, rather than only among treated households.

[Insert Figure 1]

The trial included 40 Tsimane' villages and was informed by a nine-year annual panel study (2002-2010, inclusive) and almost two decades of ethnographic work among the Tsimane'. To select the sample of villages for the trial, we eliminated villages that were participating in others studies, that were too costly to reach, that were too small or unsafe, or that contained other ethnic groups. The inclusion criteria left 65 villages, of which we selected 40 villages for the trial based on accessibility.

We conducted a baseline survey from February to May 2008, made the transfers between October 2008 and January 2009, and conducted a follow-up survey between February and May 2009. We collected expenditure data only from adults (≥16 years old or younger if they headed a household). About one-fifth of the sample had left by the time of the follow-up survey. Elsewhere we shown that attrition was random rather than systematic, and thus did not bias the results of the experiment (Behrman, Godoy, Goodman, Leonard, & Undurraga, 2011). The final sample included 494 households and 2,052 people with repeated measures.

We did not use cash transfers because of the limited use of money among the Tsimane' in remote villages. Instead, we used edible rice as in-kind income because rice is the main cash crop (Vadez et al., 2004), and a proxy for cash that is fungible and consumable.

[1] Data from the RCT is available to the public at http://heller.brandeis.edu/sustainable-international-development/tsimane/index.html; rgodoy@brandeis.edu.

Treatment 1 (T_1: 782 kg of edible rice were allocated to each of the 13 randomly chosen villages. The total transfer was equally divided between all households in a village (mean/household: 58 kg; median: 52 kg; SD: 23 kg; range 30-131 kg). Total rice per person varied by household size and by the total number of households in a village.

Treatment 2 (T_2): 782 kg of rice were allocated to another 13 randomly chosen villages; however, the total transfer was equally divided only between the poorest 20% of households in the village (mean/household: 177 kg; median: 157 kg; SD: 81 kg; range 98-395 kg). Households in the top 80% of the village income distribution received 5.9 kg of improved rice seeds.

Randomization between the female and male household head. When transferring rice or rice seeds we selected the recipient at random between the female and male head of the household.

To identify the poorest 20% of households in each village, we used the area of old-growth and fallow forest cleared by a household (adjusted by household size) at baseline. Each household clears forests annually to plant crops. The total area of forest cleared is a sensible proxy for annual income because all farm output from the plots is consumed, bartered, or sold; thus, area of forest cleared captures total household annual consumption and monetary income from farm products. However, area of forest cleared does not capture wage labor or income from the sale or consumption of forest goods.

Control villages: All households in the remaining 14 villages acted as controls. Each household received 5.9 kg of improved rice seeds, a reward similar to that obtained by the top 80% of households in T_2 villages.

Significance of transfers. The rice transfers were economically important. The transfers of edible rice amounted to about US$11/person for people in T_1 villages, US$33/person for people in the bottom 20% in T_2 villages, and US$1.70/person for people in households serving as controls. The mean daily monetary income per person among the Tsimane' (wage labor + sale of farm and forest products) was about US$0.90. Hence, transfers amounted to income earned over 12.4 days (T_1) or 36.5 days (T_2). The perceived value of the improved rice seeds at the time of the transfer may have been even lower, as there is no market for improved rice seeds in the region, and in focus groups following the trial, we found that Tsimane' did not like the harvested rice from improved seeds.

We asked household heads about the actual use of the transfers during the follow up survey. Most households did not sell or barter the rice received. Households in T_1 and the bottom 20% of T_2 reported eating most of the edible rice (76%), and a significant share (11%) of the rice was given as gift to others. Most of the improved rice seeds were planted (81%).

Variables. Table 1 contains definition of outcome and explanatory variables used in the regressions. Table 2 shows that expenditure variables were highly censored, with only 10-45% of the sample incurring expenditures. Because the expenditure variables were censored, we opted to use binary outcome variables for each expenditure category. Control variables included the baseline (2008) measures of the outcome, participant's *age* and gender (*male*), and walking *distance* (hrs.) from the village to the nearest town or road during the dry season.

[Tables 1-2]

Identification strategy. We used the following model to analyze average treatment effects:

$$Y_{ihvjt} = \alpha + \beta_1 T_{1hvt} + \beta_2 T_{2hvt} + \gamma After_t + \delta_1 T_{1hvt} \cdot After_t + \delta_2 T_{2hvt} \cdot After_t + \upsilon X_{ihvt} + \varepsilon_{ihvt} \quad (1)$$

In equation (1) the subscripts i, h, v, j, and t stand for individual (i), household (h), village (v), index of expenditure type (j), and year (t). The outcome variable, Y_{ihvt}, includes the expenditure outcome of interest (*any expenditure*, *basic consumables*, *durable assets*, and *luxuries*). *After* is an indicator variable for time (*After*=0 in 2008; *After*=1 in 2009), and *T* indicates treatment (T_1=1 treatment 1; T_2=1 treatment 2; T_1, T_2=0 control). X_{ihvt} is a vector of variables that includes the baseline measure of the outcome variable and control variables. ε_{ihvt} is a disturbance term. δ indicates the average treatment effect (δ=difference-in-difference estimator, DID).

We use equation (1) to test H1. To test H2a – whether expenditure in positional goods rises with village monetization -- we multiply all the variables in equation (1) by a variable for village-to-town distance. Villages near market towns are more likely to be involved in the money economy than remote villages.

To test H2b – whether exogenous infusions of in-kind income produced greater expenditure in positional goods of high visibility – we estimate whether the trial affected the consumption of wild game meat and meat from domesticated animals. Recall from the earlier discussion that our visibility survey found that these two classes of goods were among the most visible.

Results

Descriptive results. In Table 3 we show mean individual monetary expenditures in *bolivianos*/week for 2008 and 2009 for the pooled sample. Two findings merit mention. First, total monetary expenditures declined from 2008 to 2009 across all expenditure categories. For instance, total weekly expenditures declined from 81.36 *bolivianos* (11.24 US$) in 2008 to 72.32

bolivianos (10.30 US$) in 2009. Second, people in the bottom 20% of the village income distribution spend more in luxury items than their peers in the top 80% of the village income distribution, and the gap widened between 2008 and 2009. In 2008, people in the bottom 20% of the village income distribution spent 12.77 *bolivianos*/week (1.67 US$), compared with 10.96 *bolivianos*/week (1.51 US$) among their peers in the top 80% of the village income distribution (p=0.694). By 2009, the bottom 20% spent 18.98 *bolivianos*/week (2.70 US$) in luxury goods, compared with 8.37 *bolivianos*/week (1.19 US$) among people in the top 80% of the village income distribution (p=0.001).

[Table 3]

Table 2 lends further credence to the idea that the motivation to show off status may be more marked among people in the bottom of the income distribution. While 32.09% of people in the bottom 20% of the village income distribution bought luxury goods, only 28.30% of those at the top 80% of the village income distribution did so. In fact, a higher share of households in the bottom of the village income distribution spent money in any category of goods than did adults in better-off households. Though cast in a different way, our results are in accord with the results of the study by Charles et al. (2009); they found that in the USA poor Hispanics and Blacks spend a higher share of their income in positional goods (see also (Bloch et al., 2004; Falk & Knell, 2004)). Our descriptive result runs counter to Veblen's view that wealthier people are more likely to spend in positional goods than poorer people (Kaus, 2013).

Difference-in-difference (H1). Table 4 shows difference-in-difference estimates of the impact of the transfers on expenditure for T_1 (DID_1) and T_2 (DID_2) villages. The most striking finding of Table 4 is the absence of any effect of either treatment on the likelihood of incurring

any monetary expenditure for the pooled sample, or for people in the bottom 20% or the top 80% of the village income distribution. For instance, as we can see in the top row of Table 4, people who received transfers in T_1 villages were eight percentage points more likely to incur expenditures in luxury goods than people in control villages, while those who received transfers in T_2 villages were four percentage points less likely to incur such expenditures compared with their peers in the control group, but in neither case were results statistically significant. The middle and bottom panel show that the in-kind income transfers produced no visible, significant change in the probability of incurring monetary expenditures of luxury or any other class of goods among people in different levels of the village income distribution. These results support H1: for the pooled sample, positive exogenous income transfers will produce no discernible impact on the likelihood of incurring expenditures in positional goods since the results for the pooled sample gloss over differences that may exist by level of market exposure. Monetary expenditure for positional goods should be starker in more monetized economies (H2a).

[Table 4]

Difference-in-difference (H2a). Table 5 shows triple difference-in-difference estimates of impact on expenditure for T_1 (DID_1) and T_2 (DID_2) villages interacted with the village-to-town distance variable. We expected villages farther away to be less likely to incur expenditure in luxury items and other types of goods. We found ambiguous support for the hypothesis, and in no case were results statistically significant at conventional levels. For instance, column 4 suggests that for the pooled sample, each additional hour away from a town, was associated with a 0.4 percentage-point decline in the probability of incurring expenditure in luxuries in T_2 villages, consistent with H2a. However, for each additional hour of travel away from towns in T_1

villages, the probability of incurring expenditures in luxury goods increased by 0.2 percentage points.

[Table 5]

Difference-in-difference (H2b). Hypothesis H2b says that expenditure in culturally visible goods or services should increase with exogenous changes in income. Until now, we have used luxuries as a synonym for positional good, and compared it with expenditure in other types of goods (e.g., durables). Recall from the earlier discussion that our visibility survey suggested that certain types of goods and behaviors were readily visible to third parties. We now turn to the analysis of whether the in-kind income transfers affected the level of consumption of domesticated or wild meat (Table 6).

[Table 6]

In Table 6 we show double difference-in-difference estimates (columns 1-2) and triple difference-in-difference estimates (columns 3-4); for the triple difference-in-difference estimates we interacted DID*distance. Again, we found ambiguous and non-significant results. For instance, infusions of in-kind income in the pooled sample were associated with greater consumption of meat from game in T_2 villages but with less consumption of meat from game in T_1 villages (column 2).

Additional gender analysis. We did one additional piece of analysis. Recall that we selected at random between the female and the male head of the household. Although not part of our hypotheses, in Table 7 we estimate whether the sex of the household head who received the transfer had an effect on the likelihood of incurring various types of expenditures, particularly expenditure in luxury goods. Table 7 includes results of triple difference-in-difference estimates

between double difference-in-difference estimates and the sex of the household head receiving the transfer. The results are shown for various pooled forms (e.g., all T_1 or all control villages), and are also shown for different sub-groups of the income distribution. Again, the results produce ambiguous and statistically non-significant effects.

[Table 7]

Discussion and conclusion. As noted in the introduction, a large literature has emerged arguing that as economies develop, people invest in positional goods to show off status. The insight is hardly new. At the dawn of the Christian era, Caesar and Tacitus berated barbarians in contact with the Roman Empire for their propensity to acquire luxury goods such as glass, bronze, and silver bowls from Rome to show off status (Caesar, 1979; Tacitus, 1999). The Stoic philosophers Strabo and Seneca continued to censure the acquisition of luxuries to display status. When Veblen arrived, he was building on a long and distinguished intellectual genealogy that scorned the act of showing off. The more modern literature on how income changes induce shifts in expenditures, often toward the acquisition of goods and services of high cultural visibility has deep intellectual roots.

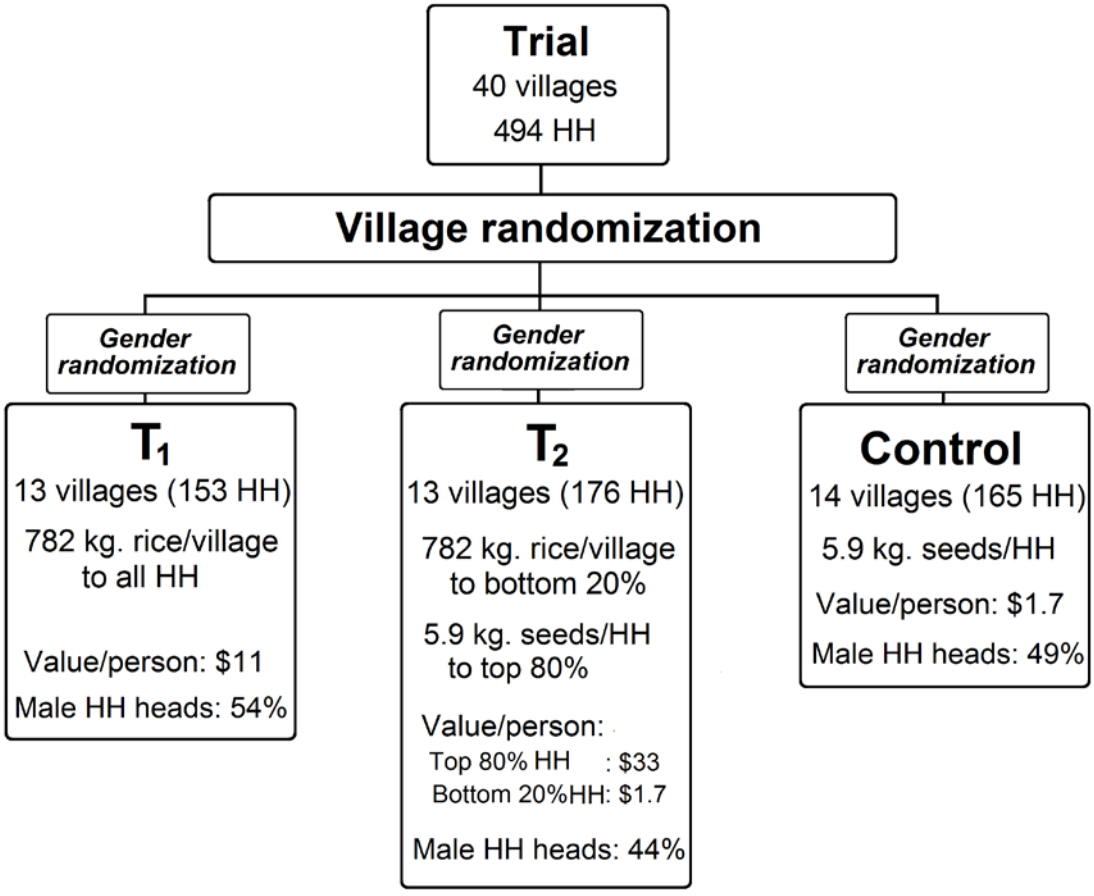
Though intrinsically interesting perhaps because it touches on a dark side of human nature – our proclivity to acquire bibelots of no intrinsic worth – this line of thinking has been hard to document with rigor for reasons alluded to in the introduction. To make valid inferences about the effect of income on consumption one needs exogenous positive income shocks. Our experiment tried to fill such a gap.

Our main finding is that random transfers of in-kind income to highly autarkic, low-income populations produce no visible change in expenditure in goods of medium cultural

visibility (e.g., durable goods, luxuries) or high cultural visibility (e.g., consumption of meat from domesticated animals or game). Why might this be so? We conclude by providing technical and substantive reasons for our null finding.

On the technical side one could allude to random measurement error of expenditures, and to insufficient statistical power to detect meaningful differences at conventional statistical confidence intervals. On the substantive side, we note that expenditure in positional goods might not matter in small-scale, egalitarian, highly endogamous communities. Like other native Amazonian societies, the Tsimane' are a highly egalitarian society that practices cross-cousin marriage, meaning that a man marries his mother's brother's daughter or his father's sister's daughter. Elsewhere we show that most Tsimane' adhere to this type of preferential marriage arrangement (Patel et al., 2007). If so, then the need to display status through consumption would wane, as a person in a small, egalitarian community would know everyone else. The need to signal status through consumption might arise when daily interactions occur with anonymous strangers, or when stratification grows. Neither has happened yet in the *barbaricum* of Amazonia.

Figure 1. Summary of the experimental design



Notes: HH denotes household. All households in T1 received rice transfers; only the households in the bottom 20% of the village income distribution in T2 received income transfers, and the top 80% received rice seeds; all households in the control group received rice seeds. The recipient of the transfers was chosen at random between the male and female household head in all groups. The sample of adults with complete information included 2,052 individuals in 470 HH; the numbers shown in the figure correspond to the sample used in the analysis (without attriters).

Table 1. Definition of variables used in the regressions

Name of variable	Definition and examples
Outcome variables - binary variables indicating if adult spend any money during the last seven days in:	
Any expenditure	1=subject spent money on any good or service; 0 otherwise
Basic consumables	1=subject bought clothing, food, hygiene (non-durable; toothpaste, soap), medicines, or school supplies; 0 otherwise
Durable assets	1=subject spent money on kitchenware (cup, pitcher, ladle), home improvements (tin roof, wire, nails), household items (rope, mat, candles), hygiene products (tooth brush, mosquito net, comb), tools and equipment (fishhook, rake, shovel), and/or transport goods (canoe, bicycle, tire); 0 otherwise
Luxuries	1=subject spent money on alcohol, luxuries (perfume, earrings, shoe polish, cassette player), restaurants, and/or sweets. 0 otherwise
Explanatory variables related to treatment: binary variables for different treatments (see Figure 1)	
A. For tables 2-4	
Treatment 1 (T1)	1=household belongs to the 13 villages which received 782 kg of edible rice/village for equal distribution between all households; 0=households in all other villages
Treatment 2 (T2)	1=household belongs to the 13 villages which received 782 kg of edible rice/village but only for the bottom 20% of the households; the top 80% of households received 5.9 kg of rice seeds per households; 0=households in all other villages
Controls	1=14 villages in which each household received 5.9 kg of rice seeds; 0 otherwise.
DID1, DID2	Difference in difference: T1*After (DID1) or T2*After (DID2)
B. For table 4	
Male winner	1=male head of the household received the transfer of edible rice or rice seeds; 0=female head of household received the transfer
Other explanatory variables:	
C. For tables 2-4	
After	Survey year. After=1 for 2009, after the intervention; After=0 for 2008, before the intervention
Age	Age of subject in self-reported years
Male	Subject's sex. 1=male; 0=female
Distance	Hours walking from village to nearest town or road in dry season

Table 2. Share (%) of adult sample (>16 years of age) who incurred monetary expenditures in different types of goods during the last seven days, by income level, 2008 and 2009 combined

Category	Income level:		
	All	Bottom 20%	Top 80%
Any expenditure	41.47	44.99	40.75
Basic consumables	39.81	43.27	39.11
Durable assets	10.23	12.32	9.81
Luxuries	28.95	32.09	28.30
N	849	155	694

Note: N includes people who incurred positive expenditures on any good, but shares are for the entire sample.

Table 3. Summary statistics of monetary expenditures by adults (>16 years of age) during the last seven days, in *bolivianos*, 2008 and 2009

Item	Income level	2008			2009			Total		
		N	Mean	SD	N	Mean	SD	N	Mean	SD
Any expenditure	Bottom 20%	173	77.55	182.40	176	103.61	289.32	349	90.69	242.29
	Top 80%	840	82.14	240.87	863	65.93	154.30	1,703	73.93	201.80
	Total	1,013	81.36	231.86	1,039	72.32	184.62	2,052	76.78	209.27
Basic consumables	Bottom 20%	173	37.06	81.43	176	47.41	117.52	349	42.28	101.24
	Top 80%	840	34.91	111.63	863	29.48	69.86	1,703	32.16	92.86
	Total	1,013	35.28	107.05	1,039	32.52	80.17	2,052	33.88	94.39
Durable assets	Bottom 20%	173	7.11	23.56	176	8.42	47.22	349	7.77	37.37
	Top 80%	840	15.82	112.66	863	9.18	66.78	1,703	12.46	92.34
	Total	1,013	14.33	103.09	1,039	9.05	63.87	2052	11.66	85.53
Luxuries	Bottom 20%	173	12.77	46.05	176	18.98	76.44	349	15.90	63.21
	Top 80%	840	10.96	56.67	863	8.37	26.15	1,703	9.65	43.95
	Total	1,013	11.27	54.99	1,039	10.17	39.61	2,052	10.71	47.81

Notes: Bottom 20% and top 80% refer to the position of the person's household in the village income distribution, with total annual area of old-growth and fallow forest cleared as a proxy for household income. Official exchange rate of *bolivianos* (BOB) to US dollars (USD) is 7.24 and 7.02 calculated as an annual average based on monthly averages for 2008 and 2009 from http://data.worldbank.org/indicator/PA.NUS.FCRF

Table 4. Difference-in-difference estimates of unconditional in-kind income transfer on monetary expenditures, Tsimane' 2008 and 2009

Income group:	Any expenditure	Basic consumables	Durable assets	Luxuries
	[1]	[2]	[3]	[4]
All (n=1,013)				
DID1	0.06	0.08	-0.02	0.08
	(0.05)	(0.06)	(0.03)	(0.05)
DID2	-0.06	-0.05	0.02	-0.04
	(0.06)	(0.06)	(0.03)	(0.05)
R^2	0.43	0.18	0.11	0.18
Bottom 20% (n=173)				
DID1	0.03	0.01	0.07	0.01
	(0.09)	(0.10)	(0.09)	(0.14)
DID2	-0.16	-0.18	0.12	-0.14
	(0.10)	(0.11)	(0.09)	(0.10)
R^2	0.54	0.32	0.31	0.26
Top 80% (n=840)				
DID1	0.06	0.09	-0.04	0.09
	(0.06)	(0.06)	(0.03)	(0.06)
DID2	-0.05	-0.03	0.01	-0.02
	(0.08)	(0.08)	(0.03)	(0.07)
R^2	0.41	0.16	0.12	0.17

Notes: Regressions are OLS with robust standard errors and clustering by village. The regressions capture equation (1) in the text. Variables not shown include T_1, T_2, and After. Controls not shown include sex, distance from village to nearest town, baseline age, and baseline outcome. * $p \leq 0.05$, ** $p \leq 0.01$, and *** $p \leq 0.001$.

Table 5. Triple difference-in-difference estimates of unconditional in-kind income transfer on monetary expenditures, interacted with village-to-town distance, Tsimane' 2008 and 2009

Income group:	Any expenditure	Basic consumables	Durable assets	Luxuries
	[1]	[2]	[3]	[4]
All (n=1,013)				
DID1*Distance	-0.004	-0.005	0.001	0.002
	(0.013)	(0.015)	(0.005)	(0.009)
DID2* Distance	-0.005	-0.005	-0.003	-0.004
	(0.007)	(0.008)	(0.005)	(0.007)
R^2	0.427	0.344	0.115	0.190
Bottom 20% (n=173)				
DID1*Distance	-0.001	-0.007	-0.006	0.029
	(0.017)	(0.019)	(0.009)	(0.017)
DID2*Distance	0.008	0.007	-0.014	0.019
	(0.012)	(0.014)	(0.010)	(0.012)
R^2	0.548	0.344	0.319	0.295
Top 80% (n=840)				
DID1*Distance	-0.005	-0.006	0.001	-0.003
	(0.014)	(0.015)	(0.005)	(0.010)
DID2*Distance	-0.010	-0.011	-0.001	-0.009
	(0.008)	(0.010)	(0.004)	(0.008)
R^2	0.407	0.161	0.118	0.177

Notes: Regressions are OLS with robust standard errors and clustering by village. The regressions capture equation (1) in the text. Variables not shown include T_1, T_2, After and interaction terms between double difference and distance. Controls not shown include sex, distance from village to nearest town, baseline age, and baseline outcome. * $p \leq 0.05$, ** $p \leq 0.01$, and *** $p \leq 0.001$

Table 6. Difference-in-difference and triple difference-in-difference estimates of unconditional in-kind income transfer on domesticated and wild meat consumption, Tsimane' 2008 and 2009

Consumption group:	Domesticated Meat	Wild Meat	DID*Distance Domesticated Meat	DID*Distance Wild Meat
	[1]	[2]	[3]	[4]
All (n=4,875)				
DID1	0.01	-0.001	0.02	-0.14
	(0.04)	(0.09)	(0.07)	(0.11)
DID2	-0.15	0.03	-0.06	-0.06
	(0.08)	(0.08)	(0.10)	(0.11)
R^2	0.36	0.35	0.07	0.02
Bottom 20% (n=836)				
DID1	-0.21	-0.10	-0.29	-0.16
	(0.11)	(0.20)	(0.14)	(0.24)
DID2	-0.06	-0.03	-0.04	-0.13
	(0.10)	(0.20)	(0.13)	(0.23)
R^2	0.33	0.37	0.08	0.10
Top 80% (n=4039)				
DID1	0.04	0.01	0.06	-0.14
	(0.05)	(0.09)	(0.07)	(0.13)
DID2	-0.20*	0.06	-0.08	0.01
	(0.09)	(0.09)	(0. 11)	(0.13)
R^2	0.38	0.35	0.09	0.03

Notes: Regressions are OLS with robust standard errors and clustering by village. The regressions capture equation (2) in the text. Variables not shown include T_1, T_2, and After. Controls not shown include sex, distance from village to nearest town, baseline age, and baseline outcome. Columns 3 and 4 are triple difference-in-difference interacted with village to town distance. * $p \leq 0.05$, ** $p \leq 0.01$, and *** $p \leq 0.001$.

Table 7. Difference-in-difference estimates of unconditional in-kind income transfer on the probability of incurring on monetary expenditures in last seven days, Tsimane' 2008-2009, by the sex of the household head who received the transfer

Explanatory variables:	T1	T2		T1 + T2- Bottom 20%	Control villages	Control villages + T2-Top 80%	Total sample
		Bottom 20%	Top 80%				
	[1]	[2]	[3]	[4]	[5]	[6]	[7]
Any Expenditure							
DID (Male winner*After)	0.048 (0.120)	-0.066 (0.110)	-0.128 (0.116)	0.060 (0.091)	0.047 (0.088)	-0.028 (0.069)	0.008 (0.055)
N	308	93	256	401	356	612	1,013
R^2	0.415	0.527	0.399	0.436	0.434	0.410	0.424
Basic consumables							
DID (Male winner*After)	0.033 (0.115)	0.050 (0.125)	-0.105 (0.118)	0.044 (0.089)	0.042 (0.099)	-0.021 (0.073)	0.006 (0.056)
N	308	93	256	401	356	612	1,013
R^2	0.385	0.476	0.364	0.402	0.391	0.375	0.387
Durable assets							
DID (Male winner*After)	-0.007 (0.041)	-0.004 (0.064)	-0.038 (0.046)	-0.008 (0.034)	-0.046 (0.042)	-0.043 (0.030)	-0.030 (0.022)
N	308	93	256	401	356	612	1,013
R^2	0.104	0.181	0.143	0.118	0.131	0.130	0.124
Luxuries							
DID (Male winner*After)	0.016 (0.072)	-0.033 (0.095)	-0.074 (0.088)	0.012 (0.056)	0.044 (0.066)	-0.006 (0.053)	0.002 (0.037)
N	308	93	256	401	356	612	1,013
R^2	0.297	0.342	0.272	0.303	0.267	0.265	0.284

Notes: Same as in Table 4. Column [7] includes T1 and T2 as covariates.

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