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**The use of primary data for cross-cultural research:**

**An example from five Amazonian societies**

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## **Abstract**

Cross-cultural research involves the analysis of particular questions in two or more distinct societies with the express intention to find general or universal patterns. The cross-cultural approach is rare in anthropology, especially when it comes to the collection of individual-level comparable data in non-Western societies. In this article we describe a research project in which individual-level data collected from different societies, under different research projects, but with the same basic methodological approach was transformed to allow comparability. Specifically, we describe the approach followed to homogenize data gathered in five societies, under the umbrella of three independent research projects that followed similar, but not identical, data collection protocols. When compared with other types of cross-cultural research, the main strengths of the approach discussed here relate to data quality and feasibility, and its main challenges to data availability, finding common but meaningful definitions across sites, and data storage and documentation.

**Keywords:** Amerindians indigenous peoples, market integration, survey, weight days, scans, comparative analysis.

## 1. Introduction

Cross-cultural research involves the analysis of particular questions or phenomena (institutions, customs, value systems, lifestyles, language and the like) in two or more distinct cultures with the express intention to identify, analyze, and explain similarities and differences across cultures and to find general patterns from them. The cross-cultural approach is common in psychology, economics, sociology, and demography, but highly debated in anthropology (see Ember and Ember 2000 for a review of arguments in the debate). Detractors of cross-cultural research argue that it is impossible to compare cultures. For detractors, the specificity of each culture and the fact that ethnographic work and description, a basic tool in anthropology, are strongly influenced by individuals' training and background make the cross-cultural approach difficult in anthropology (Evans-Pritchard 1951; Schapera 1953; Appadurai 1996). Furthermore, since societies are historically linked, one cannot assume that a particular common characteristic was independently acquired in each society (see Ember and Ember 2000; Chrisomalis 2006 for a review of the debate of what is known as Galton's problem). Supporters of cross-cultural research argue that this methodological approach is, not only possible but also desirable since cross-cultural studies enhance the external validity of results, and that researchers aiming to test hypotheses universally should use some type of cross-cultural comparison to reach conclusions that do not hinge on the choice of the society (Mace and Pagel 1994; Ember and Ember 2000).

Most cross-cultural research in anthropology has been based on the use of the Human Relations Area Files (HRAF), an ethnographic filing system developed "*to facilitate the comparative study of human society, culture, and behavior by collecting, organizing, and distributing ethnographic materials on the cultures of the*

*world*" (Ember 1997, p. 3). Because of its reliance on the HRAF, most cross-cultural research in anthropology 1) has focused on the culture as the unit of analysis, 2) has been undertaken using ethnographic data, and 3) has relied in secondary data, collected and coded by researchers other than the researcher conducting the comparison, often at different historical moments (Naroll et al. 1974; Ember and Ember, 2000; Ember 2006; cited in Chrisomalis 2006).

Few anthropological studies have addressed the collection of primary data informed by a comparative perspective from the outset. Those studies differ from cross-cultural research in neighboring disciplines in that they collect primary data in small-scale societies (Henrich et al. 2001; Lu 2007; Gray et al. 2008; Mulder et al. 2009). At the same time, they also differ from the anthropological cross-cultural research in anthropology just described in that 1) they use identical research protocols to collect primary data across a range of societies and 2) they shift the unit of analysis from the culture to the individual. The use of identical research protocols to collect primary data allows overcoming problems associated with the use of secondary data (i.e., comparability of samples, coding reliability), since researchers keep the control on how data are collected and coded. The shift of the unit of analysis to the individual allows researchers to show commonalities and differences both at the individual and at the social level. The shift also allows overcoming Galton's problem, since the focus moves from the analysis of cultural traits to the analysis of individual (or household) characteristics.

Examples of cross-cultural research using primary data collected with the same research protocol include Whiting studies of childhood (Whiting 1963), Gross et al. (1979) studies on the capacity of natural systems to sustain human populations (Gross

1975; Gross et al. 1979; Werner and Flowers 1979; Flowers et al. 1982), the work of Flora Lu and colleagues in Ecuador (Lu 2007; Gray et al. 2008), the work of Baer and Weller in Mexico (Baer et al. 1999; Baer et al. 2003), or the most recent work of Henrich and colleagues. For example, in this last study, Henrich and his team selected 15 small-scale societies exhibiting a wide variety of economic and social conditions and used a common methodology for data collection and analysis (Henrich et al. 2006; Henrich et al. 2010a). Results from this study have advanced our understanding of the roots of human sociality suggesting that there is considerably more variation in behavior across societies than had previously been reported.

But the collection of comparable data in several societies, especially in non-Western societies, is not without challenges, an important one being the costs associated to such an enterprise. A more feasible approach to conduct such type of comparison follows Murdock's (Murdock and White 1969) and Moran's (Moran 1995) intuition of pooling data from different societies and collected under different research projects. As we show through this article, such data can be transformed in a number of ways to allow comparability. Specifically, in this article we describe the approach followed to homogenize data gathered in five societies, under the umbrella of three independent research projects. We start by providing a brief description of the cultural contexts in which data were collected, followed by a description of the methods used in data collection and transformation. On the last part of the article, we discuss the strengths and weaknesses of the approach. The focus of the article is on research design and methodological

issues, as in work in progress we present research results (see for example Morsello et al. 2011).

## 2. The five Amazonian societies

Data described here were gathered in five Amazonian societies over the course of six years (1999-2006), under the umbrella of three research projects that had similar goals and followed similar data collection protocols. Data on the Araweté, Asuriní, and caboclos from Médio Juruá Extractive Reserve (Brazil) are part of a study evaluating how company-community partnerships for the commercialization of non-timber forest products affects the wellbeing of forest dwellers ([www.parceriasflorestais.org](http://www.parceriasflorestais.org)). Data on the Kayapó (Brazil) are part of a research evaluating the impacts of market exposure on social differentiation and use of natural resources (Morsello 2002). Data on the Tsimane' (Bolivia) are part of a longitudinal study analyzing the effects of integration to the market society on the well-being of the Tsimane' ([www.tsimane.org](http://www.tsimane.org)). In Table 1 we describe the ethnographic base of the groups analyzed and bellow we give some glimpses of those societies.

TABLE 1

The *Araweté* are an understudied Tupi-Guarani group of about 400 people, who control 940.900 ha of lowland rainforests on the banks of the Ipixuna, an affluent of the Xingu River. Araweté settlements are typically dispersed over large areas, with a few houses grouped by family bonds (Faria 2007). Although sporadic contacts with the Brazilian society occurred since the 1950s, the presence of the group was officially acknowledged in 1971 (Arnaud 1983) and official contact with the Brazilian government started in 1976 (Viveiros de Castro 1986). Contact with the national society

(i.e., health assistants, government employees) increased after 2001, when the Araweté relocated to a more accessible settlement. Nowadays, although most Araweté have never visited an urban area, most people below 35 years are relatively fluent in Portuguese (Faria 2007). Hunter-gatherers and slash-and-burn agriculturalists from *terra firme* forests, the Araweté are one of a few Amazonian indigenous groups still mainly relying on corn for subsistence (Faria 2007). Household chores are gender divided. Men hunt throughout the year, while women are only occasionally involved in tortoise gathering. Fishing, before exclusively a men's activity, is nowadays also pursued by women and children. Men and women gather forest products, but only men gather honey and only women weave cotton (Ribeiro 1983; Viveiros de Castro 1986; Faria 2007).

The *Asuriní do Xingu* are a relatively understudied group of about 120 people from the Tupi-Guarani speaking-family, who live in a single village at the banks of the Xingu River (Ribeiro 2009). Their territory, of about 387.834 ha, is covered with open lowland rainforests and is only accessible by boat. Traditionally, the Asuriní do Xingu lived in longhouses, home to extended families; a group of neighboring houses forming a residential group, characterized by family bonds and commonly led by a shaman (Müller 1993). Polygyny, polyandry, and intergenerational marriages were relatively common in the recent past (Müller 1993), but are rare nowadays (Ribeiro 2009). The Asuriní do Xingú entered into official contact with Brazilians in 1971, with the building of the Transamazonia highway (Müller 1993). The expansion of Altamira urban area, the cattle ranching frontier, illegal fishing, and the construction of Belo Monte dams represent Asuriní's largest threats nowadays (Ribeiro 2009). Asuriní subsistence activities combine agriculture, hunting, fishing and gathering of forest products. Men



are responsible for clearing and preparing agricultural plots, and women are responsible for planting and harvesting (Ribeiro 2009). Men from the same extended family cooperate in plot clearing and other subsistence practices. Both men and women gather forest products and fish, while hunting is solely a men's activity (ISA 2006).

**Caboclos** are the non-tribal rural inhabitants of Brazilian Amazon product of the history of detribalization, miscegenation, and immigration (Hecht and Cockburn 1989). Caboclos of the Médio Juruá were linked to rubber tapping until the 1970s. They lived organized into *seringais*, where rubber tappers were kept indebted to the *seringal* owner through a system known as debt peonage (Dean 1989). The decline in Amazonian rubber demand brought communities back to a subsistence economy, and nowadays, caboclos of the Médio Juruá live in semi-autarky and mostly depend on their own production for subsistence (Cameron 1999). Their use of natural resources includes the gathering of forest products, fishing, hunting, animal husbandry, and slash-and-burn agriculture. Although originating from miscegenated Brazilian and indigenous backgrounds, caboclo speak Portuguese and share with the Brazilian society cultural characteristics.

The term **Kayapó** refers to various closely related and well-studied subgroups, from the Je speaking family (Lea 1992). Nowadays, the entire Kayapó population consists of about 5 923 people, living in 19 different villages within seven officially recognized indigenous territories, which spread over 13 million hectares of forested and savannah areas of South-eastern Brazilian Amazonia (ISA 2011). Culturally, the Kayapó are considered to be daunting in their social complexity with rich ceremonial life and cosmology, which contrasts with their simple artifacts (Bamberger-Turner 1967; Lea 1992). Kayapó social organization is based on nuclear families and matrilineal extended

families in addition to age sets or grades, which also structure subsistence duties, and rituals. Kayapó contact with the Brazilian society began in the seventeenth century, but official settlement occurred only in the 1940s (Fisher 1994; Galvão 1979) and contact with government employees became regular only by the 1960s (Fisher 1994). During the 1970s and 1980s, several Kayapó villages experienced a more intense contact with the Brazilian society, mostly because of the presence of extractive industries in their territories (i.e., gold mining and logging). However, because there are few roads in the region and river rapids make it difficult to access many Kayapó areas, several Kayapó villages are still largely inaccessible.

Originally semi-nomadic (Werner 1983), the Kayapó nowadays display a more sedentary settlement pattern, although the group still perpetrates trekking trips for hunting and gathering, which they combine with fishing and slash-and-burn agriculture for subsistence. Labor is gender divided. Men are responsible for clearing gardens, hunting, and warfare, while women plant and maintain gardens, perform housework, and rear children. Both are in general responsible for gathering and fishing (Bamberger-Turner 1967; Vidal 1977).

The *Tsimane'* are an indigenous society of foragers and farmers living in the Bolivian Amazon. A great deal is known about the Tsimane', as they have received attention by cultural and physical anthropologists (Daillant 2003; Reyes-García et al. 2005; McDade et al. 2007; Huanca 2008; Godoy et al. 2009; Ringhofer 2010). Until the late 1940s, most Tsimane' lived isolated from the outside world: they hunted, fished, gathered wild plants, and practiced slash-and-burn agriculture for subsistence. Their relative isolation ended in the 1950s, when Bolivia's development brought them into closer contact with the mainstream society. Construction of new roads, arrival of

missionaries and highland colonist farmers, and the logging boom, put Tsimane' in contact with Bolivian society, a process that gradually transformed their social and economic system (Chicchon 1992; Pacheco 2002; Godoy et al. 2005). These changes brought modern ways of living and a new social environment that has gradually encroached upon the Tsimane' and their society. Although some Tsimane' continue to be highly self-sufficient (Vadez et al. 2004), others are adopting more modern activities such as cash cropping, sell of forest products, or wage labor, e.g. as unskilled laborers in logging camps, or cattle ranches (Vadez et al. 2008).

In sum, the five groups analyzed differ in linguistic and cultural backgrounds, but share the nature of their modes of production, the environment where they live, the sources of monetary earning, and the level of exposure to the market economy and the national system. For example, all them have potential sources of monetary earning, including the commercialization of timber and non-timber forest products (e.g. Brazil nuts, mahogany) or handicrafts (e.g. arrows, ceramics), wage labor for outsiders (e.g., guides, work on the homestead of colonist farmers) or from government institutions (e.g. teachers), subsidies, and remittances. Because of those characteristics, and because they were studied using similar methods of data collection, data from these societies offer the potential to be pooled into a single data set that would allow cross-cultural comparative research.

### **3. The creation of a standardized data set**

The three research projects discussed here heavily drew on qualitative and ethnographic information collected by graduate students through several months of continuous fieldwork (between seven and 16 months depending on the project).

Extensive fieldwork gave researchers the opportunity to conduct open-ended interviews with key informants as well as participant observation, engaging in the regular activities of the communities. Despite the importance of fieldwork and qualitative data collection for the individual projects, here we focus on data collected using quantitative methods, since they provide the data suitable for the cross-cultural comparison.

There were differences in the protocols used in each project, from the sampling strategy to the methods of data collection. Some data were collected in the same (or in easily convertible) units across sites and therefore did not need further transformation. In other cases, due to differences in protocols, data from one or more sites had to be aggregated to match a more aggregated variable at other sites. Last, because of differences in protocols for data collection and measurement units, some data needed additional transformations to allow a comparative analysis. We now describe how data were collected and which transformations they needed to generate data suitable for comparative purposes. We emphasize differences in the protocols used and explain how they were overcome to ensure comparability.

***Sampling:*** The percentage of the population sampled varied from one society to another (Table 2). However, within each society, we had selected villages and households representing a continuum of integration to the market economy. To increase variation, in the cases of the Tsimane' and the caboclos, we had selected households in two villages with different levels of integration to the market society, but comparable in other aspects (i.e., rainfall patterns, available sources of earning). For the comparative analysis we have maintained all the observations in our samples.

TABLE 2

To allow comparability, we agreed on a definition of households and adults. We defined a household as a group of people sharing production and consumption (i.e., individuals who cooked on the same fire) on a regular basis. We defined adults as people over the age of 16, because at about that age people in the studied societies are independent to form a new house, although some only do it at later ages.

In all the sites, data collection was organized in quarters. The number of quarters varied across sites from two to five (Table 2). Due to extreme mobility among some of the groups and the repeated nature of data collection, we had to deal with temporary attrition and new arrivals. Since we collected data on arrival and departures at the individual level, we were able to define a common criterion of inclusion/exclusion of adults in the pooled sample, i.e., adults who stayed/left the community for more than 60 days were included/excluded from the sample. The number of households and their composition also changed over the quarters due to birth, illness, death, and formation of new households by marriage. We used all this information to generate a quarterly variable of household size and composition.

***Data standardization:*** Table 3 presents the common methods used to collect data on the five societies in our study, as well as the timing, sample, and variables collected with each of those methods.

TABLE 3

*Socio-demographic census:* In each society, we conducted at least one census at the beginning of the research period. Most of the variables of the census (i.e., participant's age, sex, fluency on the national language, and travel frequency) were easily comparable. However, the variable formal education needed harmonization because we used different proxies for formal education in each site. Among the

Tsimane' and the caboclos, we recorded the number of years completed at school. Among the other groups we only recorded the ability read and write. To pool the data, we had to aggregate the most disaggregated variable. The result was a variable that measured whether the subject had no formal education (=0), some education (n=1), or several years of education (n=2) (in some cases proxied as the ability to write).

*Agriculture:* In each site, we did systematic evaluations of the number of agricultural plots and the size of the area cleared by each household for one year of planting. The technique for estimating plots area differed among sites. Among the Tsimane', we used self-reports. At the other sites, we directly measured plot area with a hip chain and a compass. We also noted the area planted with the major crops (rice, manioc, and maize for the Tsimane' and manioc, maize, and sweet potatoes for the rest). Since self-report among Tsimane' seem to be accurate (Vadez et al. 2003), agricultural data were easily pooled in the common database.

*Earnings:* On all the sites, information on cash income was collected at the individual level through a survey instrument, although the recall period changed from one site to another: daily for the Kayapó, two weeks for the Tsimane', and one month for the other groups. In all the cases, we collected information on all potential sources of monetary earnings available (i.e., sale, wage labor, remittances). We used the information to calculate the quarterly monetary income of each adult. To compare the monetary value of the various sources of earning across sites, first we had to generate categories of earning that could be used across sites. For example, we differentiated between different sources of earning: wages, sales, barter, and remittances. We classified each earning observation in one of those categories, and added the observations of each category per individual. For the case of barter, we used community

or town prices to estimate the monetary value of the products bartered. We then converted domestic to international values (dollars) by using the quarterly exchange rate and the purchasing power parity index (PPP). Thus, the variables that proxy earnings from the different groups capture cash income earned from wages, sales, barter, and remittances in PPP dollars/person/quarter.

*Wealth:* To estimate wealth, once a quarter we asked households in the sample the number of items owned from a list of a set of selected assets. The lists of wealth items varied across sites, but in each site included commercial items of high value (i.e., bikes, watches). The lists also included items that are typically owned by men, such as rifles, women, such as cooking pots. To obtain the monetary value of the items in our baskets of wealth, we multiplied the number of assets owned by a subject times its monetary value. We converted domestic values to dollars by using the local quarterly exchange rate and the PPP index. While the list of items varied from one site to another, invalidating direct comparisons, the estimations obtained probably capture the ranking of individual wealth in the studied societies, so individual ranking on the wealth survey is a proxy that can be used when pooling data from different societies.

*Consumption:* We measured household consumption through direct observations, although the exact monitoring method varied across groups. Among the Tsimane' and the Asuriní we had used weigh days, or the monitoring of products entering household between 6:00-7:00 to 18:00-20:00 (depending on local conditions) on days chosen at random. Among the Tsimane' we had to spend an entire day measuring the consumption of each household (or a couple of them) because the houses extended over a large area. Differently, among the Asuriní, houses were around a central plaza, so we could monitor most of them from one spot, and we could monitor

consumption more often. During weight days, we counted, measured, and weighted all the items entering the observed houses. We also asked about the place where the item was obtained (i.e., forest, agricultural plot), the method of acquisition (i.e., gathered, purchased), and the intended use (i.e., food, medicine). At the Araweté and caboclo sites the observation method was different. We walked around the villages during the entire period of observation, repeatedly asking the villagers whether any item was brought into the household. For items entering the household, we asked the same questions described before. We do not have weight day data for the Kayapó.

We defined household consumption as the estimated monetary value of all the goods entering a household on a given day. We valued goods depending on their state of processing (i.e., raw, cooked) when they entered the household. We used data on community or town prices (if there were no community prices) to price goods with market price. To price non-commercial goods, we used the amount of time it took villagers to find the good, multiplied by the prevailing daily wage in the village, and assigned the resulting value to the good. For goods for which this information was not available, we assigned the market value of the closest substitute. When we had more than one observation per household/quarter, we average them to estimate the mean value of consumption for a household during any day of the quarter. Last, we converted the value of household consumption using the PPP index.

*Time budget:* On the three projects, time allocation was measured through scans or spot observations, also known as random-interval instantaneous sampling (Sackett and Johnson 1998). Scans were conducted once or twice a week, on days chosen at random, during blocks of time also chosen at random during daylight (07:00-19:00). For the Tsimane' we used three-hour blocks of time and for the other sites we used one-hour



blocks of time. Following the standard practice (Sackett and Johnson 1998), we noted down what subjects were doing at the instant when we first spotted them. If the person was not present, we asked a proxy respondent to provide the information on the activity that the person was doing at the moment. We used data from scans to characterize time budget. For the purpose of this comparative project, we divided peoples' activities between productive (i.e., hunting, fishing, collection of TFP and NTFP, wage labor), reproductive (i.e., domestic work, child and ill care, house building), and other (i.e., rituals, resting, leisure, etc.) activities. Since scans were conducted in several quarters, our measure captures variation in time allocation through the year. Since we conducted several scans per quarter, we were able to calculate the number of times each individual was spotted (or reported) in the activities of interest. Thus, time allocation is measured as the percentage of observations in a given activity.

To summarize, the pooled dataset includes information on standard socio-demographic variables of informants, as well as quarterly information on individual and household relative and absolute income (by sources of cash), wealth ranking, value of farm and forest products consumed, and use of time. Such a data set is being used to analyze whether a process affecting the five societies (i.e., integration to the market society) had the same effects in the well-being and use of natural resources across societies. Because data remain highly disaggregated (at the individual or the household level), the database can also be used to test other hypotheses that have been advanced on ethnographic descriptions, and do so using the individual or household (not the culture) as the unit of analysis. For example, some other ideas we are currently exploring include the impacts of education on income in highly autarkic indigenous societies (Morsello et al. 2011), the effects of partnerships between forest communities and

companies for trading non-timber forest products on local well being (Morsello et al. in preparation), and changes in time budgets of indigenous societies with integration to the market economy (Ruiz-Mallen et al. in preparation).

#### **4.- Strengths and challenges of the approach**

The methodological approach presented here draws on two traditions of cross-cultural research in anthropology. On the one side, it follows Murdock's and White's (1969) intuition on the potential of pooling data collected by independent researchers, in different societies, and using different research protocols. This article shows how, provided some commonalities, individual and/or household level data from different cultures can be transformed, coded, and pooled in such a way that allows for a comparative analysis.

On the other side, the approach presented here also follows Henrich's (and others') intuition on the potential of using data disaggregated at the individual (or the household) level to conduct cross-cultural research in small-scale societies. Cross-cultural research in other social sciences has often used the individual as the unit of analysis, but has centered on the analysis of individuals from what Henrich has ingeniously called WEIRD (Western, Educated, Industrialized, Rich, and Developed) societies (Henrich 2010; Henrich et al. 2010b; see also Ember and Ember 2000). Anthropologists have the potential to add data from non-WEIRD individuals and societies, thus allowing for a more real test of the universality of concepts and processes.

By bringing together the two approaches, the type of comparative analysis presented here opens new possibilities for cross-cultural research. But the harmonization of such datasets is costly and not without challenges, so before engaging in such an enterprise, researchers should consider the pros and cons of the approach. We devote the rest of this section to discuss the strengths and challenges of the methodological approach, as a guide to other researchers in deciding whether or not to invest in harmonizing individual/household data for comparative analysis

***Strengths:*** The approach presented here shares with other types of cross-cultural research the potential to examine the degree of uniqueness of given relations, or in other words its degree of generalization. But the approach presented here has two additional strengths: 1) data quality and 2) feasibility.

An important strength of this approach relates to the quality of data both during collection and transformation. The three research projects pooled in the comparative analysis heavily relied on classic anthropological methods and techniques of data collection. Probably because of the costs associated with long term anthropological research, most previous cross-cultural research projects using individual level data have heavily drawn on survey techniques. Those projects have, somehow, neglected the potential contribution of standard anthropological tools that allow a deeper understanding of the society, but that come at the cost of working with small sample sizes (but see Lu 2007). In a review of methods to collect multi-site data, Jones et al. (2010) noticed that “in the end, it seems that data quality control can depend on the researchers’ and the interviewers’ knowledge of the study population” (p. 262). By

relying on projects based on extended stays on the field, and using data collected through a variety of techniques framed with the standard anthropological perspective (i.e., participant and non-participant observation, sound ethnographic understanding of the culture, learning the language, and the like), one can improve the overall quality of the data to be used for comparative analysis.

Additionally, in this project we use primary data collected and coded by the same teams that collaborate in the cross-cultural comparison. Previous researchers have highlighted that comparative research using data from secondary sources can be methodologically flawed, and that the use of primary data and coding one's own variables can help overcome this problem (Otterbein 1990). Critics to cross-cultural research have also underlined that comparative data are highly aggregated in imposed categories, and that aggregation make coding notoriously error-prone, which might seriously affect research results (Mace and Pagel 1994). The collection of highly disaggregated data, allows, in a second stage, to create adequate categories and definitions suitable to the different case studies, thus reducing coding errors that might appear when using data coded by others'.

Another strength of the approach presented here relates to its feasibility. A big setback to the collection of highly disaggregated data in several small-scale societies is, no-doubt, the cost (in time and money) associated to such research. Furthermore, the cost would be prohibitive if one were to design such projects including the collection of detailed ethnographic data. Thus, pooling data from individual research projects (easier to design, conduct, and fund than large cross-cultural

projects) provides an alternative, more feasible, approach to conduct comparisons of individuals across several small-scale societies.

*Challenges:* The main challenges of the approach presented here relate to 1) data availability, 2) finding common but meaningful definitions, and 3) data storage and documentation.

A main challenge to conduct research projects as the one presented here relates to the availability of data that allow selecting a representative sample to answer the proposed research question. The concerns about data availability relate to sample quality and thus to the generalizability of research results, the fundamental goal in cross-cultural research. Ideally, the choice of cultures and individuals within a culture should be made on the basis of a theoretical framework—in our case, capturing the range of variation across integration to the market economy by Amazonian subsistence societies. However, adequate data from ideal case studies is not likely to be available in many cases. Some years ago, Moran (1995) proposed some minimum norms of ethnographic data collection and reporting specially for agrarian systems. As highlighted in that edited volume, the collection of standard data in anthropology would allow answering basic questions about human populations-in-ecosystems, such as population growth and agricultural change, people and food supply, labor input and return, or the structure of individual rational decision making. Unfortunately, the call passed unnoticed and, overall, anthropologists lack datasets with standard data that can be compared across case studies.

A second important challenge is finding common but meaningful definitions of phenomena of interest across case studies. Although the use of raw, disaggregated data helps in creating definitions and variables that can be used across cultures, this—in some

cases- might imply to put borders where there are none. For example, for this study we had to explicitly define a household. Yet the borders of households in contexts such as those of indigenous groups are fuzzy. Among the Kayapó, for instance, there are individuals who commonly eat on another household for reasons as simple as “they like more the food”. In all other regards, however, they are part of another household. Households are also unstable and may change several times during a period of data collection. Different cultures may differ in how they fit more or less into these commonly used units of analyses. So finding common definitions and codes for variables is one of the biggest challenges for the type of project proposed here.

The third challenge of such projects relate to issues of data storage, documentation, and dissemination. Some of these issues do not relate only to the specific research project presented here, but have to do with general trends in the discipline. The type of research presented here must be a team effort, often including researchers from different disciplines. Effective collaboration requires that the data collected had been clearly documented, so researchers other than those who collected the data can make sense of them. As Gravlee et al. (2009) have noticed, detailed documentation serves to track consistency and change in techniques or variables and to reconstruct the meaning of data so it can be adequately transformed for the cross-cultural analysis. Detailed documentation helps researchers unfamiliar with the original data collection to use the data.

## **5. Conclusion**

Since each methodological approach has strengths and weaknesses, the goal of this paper is to discuss a type of cross-cultural research that could complement, not replace, other anthropological techniques for one-site or cross-cultural research. One-

site methods are best suited for examining the nuances of a specific society and establishing hypothesis and potential pathways for the relations hypothesized, but they do not allow for generalizations. Some comparisons, such as synchronic comparisons of cultural traits, allow for examining how societies function (or fail to function) and establishing patterned correlations of cultural traits, whereas others, such as diachronic cross-cultural comparisons, can help establish how societies change over time (Chrisomalis 2006). The approach presented here, comparisons based on individual level primary data from individuals across societies, complements those approaches by helping identify patterns of inter-cultural as well as intra-cultural variation.

Although not without challenges, comparative studies of individual data across different societies should be included in the toolkit employed in anthropology. Our argument does not call for replacing conventional ethnography for the collection of systematic individual level data, but rather for using both techniques in a complementary way.

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Table 1

Ethnographic summary of studied societies

<b>Group</b>	<b>Araweté</b>	<b>Asuriní</b>	<b>Caboclos Meio Juruá</b>	<b>Kayapó</b>	<b>Tsimane'</b>
<b>Country (State)</b>	Brazil (Pará)	Brazil (Pará)	Brazil (Amazonas)	Brazil (Pará)	Bolivia (Beni)
<b>Linguistic family</b>	Tupi-Guarani	Tupi- Guarani	Portuguese	Je	Tsimane'
<b>Land tenure type</b>	Indigenous Territory	Indigenous Territory	Extractive Reserve	Indigenous Territory	Indigenous Territory
<b>Name of territory</b>	Território Indígena Araweté/ Igarapé Ipixuna	Território Indígena Koatinemo	Reserva Extrativista do Médio Juruá	Área Indígena Kayapó	Territorio Indígena Tsimane'
<b>Residence</b>	Uxorilocal	Matrilocal	Bilocal	Matrilocal	Bilocal
<b>Population</b>	398 (2 villages)	120 (1 village)	700 (13 villages)	3096 (14 villages)	8000 (100 villages)

Table 2  
Sampling strategy

<b>Group</b>	<b>Tsimane'</b>		<b>Araweté</b>	<b>Asuriní</b>	<b>Kayapó</b>	<b>Caboclos Meio Jurua</b>	
	San Antonio	Yaranda	Ipixuna	Koatinemo	A'Ukre	Roque	Pupuaí
Village(s) surveyed							
Village population	170	164	326	122	258	480	186
Total number of households	31	28	53	13	24	58	23
(% of households surveyed)	(90%)	(90%)	(56%)	(100%)	(100%)	(43%)	(100%)
Number of people in the sample	304		193	122	258	370	
Survey period	22/04/2002 to 25/08/2003		06/01/2005 to 02/12/2005	03/01/2005 to 23/10/2005	14/05/1999 to 03/05/2000	23/04/2005 to 19/11/2005	
Survey waves	5		3	3	4	2	

Table 3

Quantitative methods for data collection: time, sample, and variables

<b>Data collected</b>	<b>Rationale</b>	<b>Variables created</b>
Individual socio-demographic characteristics	Basic demographic information of all people in surveyed households	<ul style="list-style-type: none"> <li>• Age, in years</li> <li>• Sex, binary</li> <li>• Formal education, in levels</li> <li>• Language fluency, in levels</li> <li>• Travel frequency, in levels</li> </ul>
Agriculture	Information related to agricultural plots and crops of all households in sample	<ul style="list-style-type: none"> <li>• Number of plots</li> <li>• Plot surface, in ha.</li> <li>• Area of main crops, in ha.</li> </ul>
Earnings	Amount of cash earnings received by all adults in the 30 days previous to the survey	<ul style="list-style-type: none"> <li>• Wage, in PPP dollars/person/ quarter</li> <li>• Sale, in PPP dollars/person/ quarter</li> <li>• Barter, in PPP dollars/person/ quarter</li> <li>• Remittance, in PPP dollars/person/ quarter</li> </ul>
Wealth	Monetary value of a basket of items owned by all adults in the sample	<ul style="list-style-type: none"> <li>• Modern wealth, in PPP dollars/ household/quarter</li> <li>• Luxury wealth, in PPP dollars/household/ quarter</li> </ul>
Consumption	Monetary value of all items entering a house in an average day	<ul style="list-style-type: none"> <li>• Value of products consumed by the household, in PPP dollars/quarter</li> </ul>
Time budget	Distribution of adult's time across activities	<ul style="list-style-type: none"> <li>• Percentage of times an individual was observed in selected activity</li> </ul>

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