GENDERED TIME ALLOCATION OF INDIGENOUS PEOPLES IN THE ECUADORIAN AMAZON[1]

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This article reports inter- and intra-ethnic patterns of time allocation for five ethnic groups in the Ecuadorian Amazon—the Huaorani, Quichua, Shuar, Cofán, and Secoya—to test for general cross-cultural differences as well as the idea that females and males occupy the private and public sphere, respectively. The concept of public versus private spheres posits that women have less economic and political power and occupy the domain of domestic and individual affairs, while men occupy the public sphere that correlates with civic affairs and work at higher social scales and in spaces outside the home. The research team collected almost 24,000 spot-check time allocation observations in eight indigenous communities from February to June, 2001, representing a large cross-cultural data set. Unlike many previous studies of time allocation, which use standard significance testing to detect differences in means, our description of time allocation among these ethnic groups utilizes confidence interval graphs to interpret the statistical significance of differences observed. We find remarkable consistency in time spent in categories such as "social," "individual," "domestic," and "subsistence" among these groups, despite the variation in their social organization, histories of contact, integration into the market, and population size. A few consistent gender divisions of time use were found that support the private/public sphere characterization, namely that for all groups, females spent significantly more time in domestic activities, and males spent more time in commercial production (except in the case of the Cofán). However, other time-use categories corresponding to the private (i.e., individual and subsistence) and public (i.e., social and outside the community) spheres did not support a gender division, nor was support found for the hypothesis that the relegation of females to the private sphere would be more apparent for gender hierarchical groups and less so for more egalitarian groups. We posit that dichotomies of male/female, public/private, and political/domestic oversimplify boundaries that are varied, dynamic, and often indistinguishable. (Time allocation, gender, indigenous peoples, Amazon, Ecuador)

This article uses a cross-cultural data set encompassing five indigenous groups in the northern Ecuadorian Amazon to test for inter- and intra-ethnic differences in time allocation as well as the degree of a gendered division of labor and space

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(known as the "public" versus "private" sphere). Although the Huaorani, Quichua, Cofán, Secoya, and Shuar inhabit generally similar ecological conditions and all possess mixed household economies based on horticulture, wild game procurement, and some degree of wage labor, they vary greatly in their social organization, histories of contact, integration into the market, and population size (Holt et al. 2004). These groups were chosen because of this inter-ethnic diversity and because they are the predominant indigenous populations in our study region. We investigate whether these groups differ in the time allocated to categories such as subsistence, social, commercial, and individual activities (following Johnson 1975), and then investigate gender dynamics. In addition to reporting empirical results, we highlight the advantages of confidence intervals as an alternative to null hypothesis significance testing and the presentation of p-values for the analysis of time allocation data.

Gender, the social construction of difference between men and women, assigns particular societal roles with their associated ascribed abilities and traits (Marini 1990). The prevalent view of females as doing the cooking and preparation of vegetal foods while men are the warriors and hunters summarizes a division of labor that is the root of gender differentiation. In this view, males possess more ability to acquire and control valuable resources. As Marini states, "Power, privilege, and status have rarely, if ever, been shared by women and men on an equal basis" (1990:96). Men and women occupy distinct spaces that reflect differing levels of power in the division of labor. Women, presumably with less economic and political power, tend to occupy the home environment, the domain of domestic or individual affairs, or the "private" sphere. Men occupy the "public" sphere that correlates with civic affairs, work at higher social scales, and spaces outside the home (Keohane 1992). The greater the differentiation between private and public roles, the more restricted are the status and activities of women. Is there empirical support for such division among Native Amazonians, among whom there is considerable variation in gender relations and behavior (Seymour-Smith 1991)? What kinds of cultural variability do we see in gender activities? Do more egalitarian[2] groups allow women more access to public spaces, as well as a more even distribution of household tasks between men and women (Geerken and Gove 1983)? One approach to address such questions is through time allocation study.

Time allocation (TA) studies are well established in anthropology, as well as other fields such as sociology, engineering, and management science. This quantitative observational technique enables researchers to collect detailed, accurate descriptions of behaviors in context, making it possible to address a multitude of questions, to collect reliable and replicable empirical data, and to test specific hypotheses statistically. Gross (1984) lists a variety of benefits of the time allocation method, but one particularly noteworthy for this article is the usefulness of

TA to comparative studies, providing a basis for describing and analyzing inter- and intra-cultural variation. Quantitative methods such as TA, in recording a "microscopically detailed behavioral record" (Gross 1984:519), are especially important to implement in situations where societies are undergoing rapid cultural, economic, and ecological changes, and observations cannot be repeated.

This simple fact highlights the need for such study among contemporary populations of Native Amazonians, who face rapid and dramatic processes of change, including market integration, land circumscription (e.g., by colonization, extractive industries, and protected area establishment), increasing resource scarcity, and demographic growth (Fisher 2000; Godoy 2001). TA studies have a long history in Amazonian research (Hames 1989) and have been used to examine topics such as the impact of particular technologies (Hames 1979), nutrition and energy balance (Dufour 1983, 1984; Johnson and Baksh 1987), and ecological "limiting factors" on cultural development (Baksh 1985) and the related debate on energy or protein maximization versus time minimization in subsistence strategies (Werner et al. 1979; Behrens 1981; Hames 1989; Beckerman 1993). After Gross et al.'s (1979) influential article examining the relationship between the productivity of subsistence and participation in market economies, recent articles have integrated time allocation studies to examine the cultural and ecological effects of market integration (Santos et al. 1997; Lu 2007). Many of these scholars have undertaken multi-group research on time allocation in Amazonia. Renewed emphasis in documenting time-use patterns among Native Amazonian societies is necessary to understand processes of demographic, economic, ecological, and cultural change and disruption.

Here we summarize findings from a TA study undertaken in eight communities of five indigenous groups of the northern Ecuadorian Amazon. The results come from almost 24,000 data points collected through the spot observation (also known as instantaneous sampling or point sampling) method of time allocation, a technique specifically noted for being able to provide "a solid database for cross-cultural comparison" (Borgerhoff-Mulder and Caro 1985:324). The data we present improves upon former TA studies of the Amazon in many aspects: first, in the cross-cultural nature of data collection, where a dozen field researchers were trained together on a TA data-collection protocol and were stationed in multiple communities making spot observations over five months; second, the size of the data set; and third, the format in which those data were analyzed, moving beyond the pitfalls of standard significance testing and data reporting (which often gives mean percentages of observations without a measure of variance, e.g., Johnson 1975; Munroe et al. 1983; Baksh 1985; Descola 1994; all the time allocation studies in Hames and Vickers 1983).

In this article we run three sets of analysis: (1) an overall inter-ethnic comparison by activity category, (2) an intra-ethnic gender comparison in activities,

and (3) an inter-ethnic gender comparison. Despite the cultural variation represented by these groups (see Ethnographic Background), we find that their time allocation patterns indicate commonality amid such difference. With few exceptions, inter-ethnic time allocation for each activity code tends to be clustered, such that percent time spent by ethnicity generally falls within a +/- 5% range of each other. For example, all groups spend roughly 40% of their time in social activities, 25% in individual activities, and about 10% each in domestic, commercial, and subsistence activities. Only a few consistent gender divisions of time use were found that support the private/public sphere characterization; namely, that for all groups, females spent significantly more time in domestic activities and males spent more time in commercial production (except the Cofán). However, other time-use categories corresponding to the private (i.e., individual and subsistence) and public (i.e., social and outside the community) spheres did not support a gender division, nor was support found for the hypothesis that the relegation of females to the private sphere would be more apparent for gender hierarchical groups and less so for more egalitarian groups.

ETHNOGRAPHIC BACKGROUND

What follows below are brief ethnographic sketches of the five indigenous groups involved in this study, with attention paid to gender dynamics (for further descriptions see Macdonald 1999; Rudel et al. 2002; Rival 2002; Vickers 1993; Califano and Gonzalo 1995). Holt et al. (2004) summarizes the qualitative data from open-ended semi-structured interviews implemented concurrently with the time allocation studies reported here, providing a more complete ethnographic context. An important caveat: clearly a sample of eight communities is not representative of these ethnic groups as a whole, as it reflects only our choices of study communities. There is tremendous intra-ethnic diversity; for instance, one Huaorani community sits at the end of the Via Auca oil road, whereas another is deep in the forest, reachable only after a long plane ride or days in a motorized canoe.

Shuar

The Shuar are members of the Jivaroan language group concentrated near the Peru/Ecuadorian border; they number about 40,000, the second largest indigenous population in the Ecuadorian Amazon. The Shuar have a long history of contact with outsiders, beginning with Catholic priests in the early twentieth century. Perhaps partly as an attempt to protect their lands against colonist incursions, the Shuar have adopted cattle raising to secure land claims and have reorganized themselves from dispersed household settlements to nucleated

centros or communities on 3,000–6,000 hectare tracts (Rudel et al. 2002). Originally from the southern Amazonian province of Morona Santiago, many of the Shuar have migrated north to the four northern provinces of Pastaza, Orellana, Napo, and Sucumbios in search of land. Our study includes such a migrant Shuar community, Tiguano, in Orellana, about three hours by vehicle south of Coca. This group is not necessarily representative of the larger Shuar population, but may not be very dissimilar from other Shuar population groups in the northern Ecuadorian Amazon.

Seymour-Smith (1991:633) examines the politics of Jivaroan gender relations and argues that there is "considerable evidence for the existence of gender hierarchy in these otherwise egalitarian societies." The political organization of the Ecuadorian Shuar, the Achuar of Ecuador and Peru, and the Peruvian Aguaruna and Huambisa continues to revolve around inter-factional competition and conflict, which is in turn correlated with gender hierarchy. Inter-group relations are "predicated on a relationship of gender subordination in which women are cast as objects to be appropriated or exchanged" (Seymour-Smith 1991:641) and whose sexuality and fidelity is a focus of intense concern or outright violence. Male dominance is manifest in the system of marriage alliances and domestic politics which severely limit women's autonomy and control in significant domains of their lives, while no parallel domains of unilateral female control exists over male activities (Seymour-Smith 1991:642). As Rubenstein (1993:3) plainly states, "Shuar women have long been subordinate to men," treated as war booty or servant to their husbands, and subject to beatings. Among the Aguaruna, culturally similar to the Shuar, women also have less power than men, as seen through their subordinate position in political matters, lack of leverage in domestic conflicts, and lower ability to realize personal goals (Brown 1986). Brown (1986) links these patterns to the much higher degrees of suicide among Aguaruna females.

Secoya

The Secoya Indians of Ecuador live along the Aguarico River and its tributaries downriver from Lago Agrio. They are descended from the "Encabellado," a once large ethnic population in the northwestern Amazon basin described by Jesuit and Franciscan missionaries in the seventeenth and eighteenth centuries whose ancestral territory covered 82,000 km^2 along the Aguarico River and the north bank of the Napo River (Vickers 2002). The Secoya belong to the Western Tocanoan linguistic family and refer to themselves as Pãi, meaning "people." At one point estimated to have 12,000 people, their population drastically declined during the conquest due to sickness and slavery. They currently number only about 700 people in Ecuador and Peru together (Cabodevilla 1989, 1997; Vickers

1989a). They live in scattered households or small villages along the banks of rivers (mainly the Aguarico) and streams, in the past relocating their settlements every 5 to 20 years. In 1996, Secoya territory was legalized as "Centro Siecoya Remolino," which encompassed 23,000 hectares of land, including part of the ecologically rich Cuyabeno Wildlife Refuge. In 2001, another 2,807 hectares officially increased their territory. The ethnographic study community of Sewaya is about an hour by car plus two hours by motorized canoe east of Lago Agrio.

According to Vickers (1989b), the Secoya live in an unstratified society with no institutionalization of strong leadership statuses (e.g., no ranking of sibs, clans or lineages). The most salient leadership status is that of the headman/shaman, who leads by influence rather than authority and whose role is to maintain the health and well-being of the community. Females, however, cannot become shaman, although some are known for their expertise as herbalists and interpreters of dreams. Domestic relations between husband and wife also tend to be egalitarian. Men do most of the hunting, but women occasionally assist in the collection of turtle eggs. Female respondents state, "Hunting is for men," and "The forest is the place of the men and our place is in the village" (Vickers 2002:228). Secoya women spend most of their waking hours doing domestic chores around the house or in nearby gardens; and when they venture farther from their households, they usually travel with their husbands and children. Many aspects of female sexuality are perceived as dangerous, e.g., menstruation is an "illness" and contact with menstrual blood is thought to lead to life-threatening problems for men. During their cycle, menstruating women are kept in isolation, living in a separate dwelling and using their own eating utensils. Monogamy is widely practiced, divorce uncommon, and sexual intercourse is restrained, as it is believed that too much sex weakens men and makes women suffer (Vickers 2002).

Quichua

The Quichua (also spelled Kichwa) are the most numerous of Ecuador's Native Amazonian peoples, with an estimated 60,000 people in Sucumbios, Orellana, Napo, and Pastaza provinces (Irvine 2000). Like the Shuar, they have a long history of contact with outsiders; indeed, the lowland Amazonian Quichua—who call themselves Runa—first emerged as a distinct ethnic group when pre-existing indigenous societies were decimated by disease, violence, and social disruption during the Spanish conquest. Both linguistic and historical data indicate that the Runa are an amalgam forged from a multitude of cultures that existed in the region prior to the sixteenth-century Spanish conquest. The arrival of the Spanish, the exploitative *encomienda* system, and smallpox epidemics decimated these ethnic groups. Survivors decided or were obliged to live in

mission villages where Quichua, an Andean language, was a *lingua franca* (Irvine 2000). Today, the Runa recognize three main zones with distinct cultural and linguistic characteristics: the Canelos Runa of Pastaza Province, and the Napo and Loreto Runa to the north. Our ethnographic sample includes Pilchi, a Quichua community three hours by motorized canoe downriver from the provincial capital of Coca on the Napo River, and Pastaza Central and Pachacutik, two smaller communities west of Lago Agrio (two hours by car, plus another two hours on foot).

Uzendoski's (2005) ethnography of the Napo Runa emphasizes gender complementarity such that opposing forces—male and female, death and life—stand in a constant transformative and dynamic relationship. In terms of space, the forest and river are seen as masculine and feminine, respectively, whereas the garden and house are considered feminine spaces. Muratorio (1998) emphasizes that women's work, especially the production and preparation of food, is subject to incessant judgment in light of the high standards in work ethic and aesthetics considered essential for the full realization of a woman's personal and social self. Power inequalities underlie Muratorio's statement that "a woman's perceived failings in performing all the household duties expected of her is the most common excuse given by the husband for physically abusing her. Most women are keenly aware of the potential for gender conflict and violence within the domestic space" (1998:412).

Cofán

The A'i people, or Cofán, traditionally occupied the area between the San Miguel River, Guamuez River, Bajo Putumayo River, and Aguarico River (southern Colombia and northern Ecuador). Their origin is unknown. Some believe the A'i language is unique, while others think it belongs to the linguistic Chibcha family of Colombia (Califano and Gonzalo 1995; Cerón 1995). Historians place the pre-Conquest Cofán population between 30,000 and 70,000 individuals. At the end of the nineteenth century, during the rubber and quinine booms, the Cofán suffered from being exploited in the rubber trade. Some decades later, beginning about 1970, they were displaced by the exploitation of petroleum in the Ecuadorian Amazon, forced to move from the region around Lago Agrio (where significant oil deposits were first discovered in 1967) to scattered settlements farther east, deeper into the forest. Currently, there are approximately 1,400 Cofán in Ecuador living in 10 communities along the San Miguel, Aguarico, and Bermejo Rivers (with about the same number living in Colombia). In 1992, through an agreement with the Ministerio de Agricultura y Ganaderia, the Cofán were given legal title to 80,000 hectares. In 2001, the government expanded Cofán territory by 50,000 hectares in the area of the Guepi

River (Albuja et al. 2001). Our ethnographic sample includes a community far to the east along the Aguarico River, near the border with Peru. Zábalo is about one hour by car plus eight hours by motorized canoe east from Lago Agrio.

Cepek (2006:381) characterizes Cofán gender relations as relatively egalitarian: ". . . women's abilities to hunt and to attain shamanic power, for example, are made possible by the relatively weak normativity of Cofán social structure, which allows individuals to develop idiosyncratic preferences and proclivities in a socially underdetermined way." Women participate in household decision-making processes on an equal footing with their husbands. However, women are at a disadvantage in terms of participation with the outside world in the disparities in the acquisition of formal education, leadership positions, and Spanish skills. Cepek (2006) gives various reasons for this, such as the history of rape of Cofán women by oil workers, threats by colonists, and the tendency for outsiders to want to intermarry with Cofán women and the concomitant desire of Cofán men to avoid this.

Huaorani

The Huaorani (also spelled Waorani) are the least "assimilated" of Ecuador's indigenous people. Protestant missionaries contacted the Huaorani peacefully for the first time only in 1958 (some Huaorani sub-groups still have not been peacefully contacted, and fiercely resist such contact or intrusions of outsiders). From a population numbering only about 500 at the time of missionary contact, they now number approximately 2,000 persons (Beckerman et al. 2009). Their language, *huao tededo*, is a linguistic isolate, and while they refer to themselves as Huaorani or "the people," a more common title used by outsiders has been *Aucas*, or the Quichua word for "savages," linked to their propensity for warfare and spearing raids. This bellicose reputation has enabled them to command a large territory. When peaceful contact was established, they controlled nearly two million hectares of territory, bordered on the north by the Napo River and on the south by the Curaray River. Currently, however, they have legal title to only about a third of this area. In 1983, 66,570 hectares were legalized by the Ecuadorian government as a Huaorani "protectorate," and in 1990 the government granted them an additional 612,560 hectares of their traditional lands (Kimerling 1991:87). Before missionary contact, Huaorani settlement pattern encompassed dispersed and autonomous *nanicaboiri* (longhouses) of closely related kin; now, small nucleated communities centered around a landing strip and a school are more common. Our sample includes two communities in Napo Province along the Shiripuno River, about five hours by motorized canoe from the nearest road.

According to Yost (1991), although generally speaking the Huaorani have a gendered division of labor, there is an atmosphere of equality between men and women. While men tend to do the hunting, clear gardens, and protect the household and women tend to engage in childcare and domestic and horticultural tasks, women may also engage in hunting and men may take on more of the garden tasks than just chopping trees. Yost writes, "the assessment of greater value or worth on one sex or the other because they perform different tasks is lacking . . . . In Wao thinking, the idea of relative worth is not a concept relevant to the consideration of sex roles" (1991:109). Much of Huaorani social relationships is governed by this concept of equality among the sexes. Their political structure is egalitarian, lacking castes or chiefs; leadership is situational by nature and impermanent. Robarchek and Robarchek reinforce this interpretation of Huaorani social relations, writing, "People are equal, politically and economically. . . . There are *no* rank distinctions on the basis of gender, kinship, wealth, or anything else" (2005:212).

In summary, while each of these Native Amazonian groups has been characterized as relatively "egalitarian," there appears to be a range in terms of women's power within gender dynamics, with the Shuar tending towards male dominated, followed by the Quichua, with Secoya and Cofán more towards equality, and the Huaorani the most egalitarian. Given this characterization, do we see inter-ethnic differences in women's time allocation, and is their occupation of physical and social space congruent with the notions of private versus public realms?

METHODS

The data for this article comes from a three-year research project co-led by Bilsborrow and Lu and funded by the National Institutes of Health. The overall objective of this study is to determine the demographic, socio-economic, and biophysical factors influencing land use by indigenous populations in Ecuador's Northern Amazon, and then to compare the findings with the results of Bilsborrow's previous research on the migrant colonist populations (see Lu et al. 2010). Our methodological approach uses both quantitative and qualitative methodologies from demography, landscape ecology, anthropology, and political ecology. Data collection, carried out in 2001, involved two phases of fieldwork: (1) an ethnographic study in eight indigenous communities, and (2) household and community surveys in 28 additional communities. The first phase of data collection was an ethnographic study carried out from February to June, 2001. Ethnographic researchers worked in eight indigenous communities for a five-month period (see Table 1). Given the much larger size of the Quichua population, the purposively selected sample included two Quichua villages, along with

one village each for the Shuar, Secoya, Cofán, and Huaorani. But two of the villages (one Quichua and one Huaorani) had recently splintered, resulting in a final ethnographic sample of eight villages, including three Quichua and two Huaorani villages. We studied a total of 120 households representing 677 individuals.

To examine the different labor tasks and inputs and their variation by age, gender, household size/composition, and ethnicity, we employed a time allocation survey using the "spot check" method (Borgerhoff-Mulder and Caro 1985). Time allocation data were collected for people age five and older through randomized household visits. Using a table of random times between 6:00 a.m. and 7:00 p.m., ethnographers visited all logistically feasible households in the community using a circuit whose starting point was random. Fieldworkers noted the following information on each data form: name of community, name of head

Table 1
Sample of Communities for Ethnographic Study

Community	Ethnicity	No. of Households	Percentage	No. of Individuals	Percentage
Pilchi	Quichua	22	18.3%	133	19.4%
Pachacutik	Quichua	11	9.2%	79	11.7%
Pastaza Central	Quichua	10	8.3%	57	8.4%
Total Quichua		43	35.8%	269	39.5%
Quehueiri-ono	Huaorani	10	8.3%	67	9.9%
Huentaro	Huaorani	7	5.8%	43	6.4%
Total Huaorani		17	14.1%	119	16.3%
Zábalo	Cofán	27	22.5%	131	19.6%
Sewaya	Secoya	20	16.7%	97	14.3%
Tiguano	Shuar	13	10.8%	70	10.3%
		120	100.00%	677	100.0%

of household, date of observation, observer, and time of observation. For each member of the household, we recorded the following data:

1. Name of person observed: filled in for each member of the household for each visit (excluding children below age five);
2. Primary and secondary activity codes: these classify the main intent, function, or result of the observed action (similar to Johnson 1975). The researcher marked the code that seemed most correct, based on the list of possibilities in Table 2, but also including a brief description of the actual behavior observed (to allow recoding later, if desirable). If the subject observed was doing two activities at the same time, one code was registered as primary and the other as secondary;
3. Specific codes: these codes break down the primary (or secondary) codes into specific actions with a higher level of detail;
4. Location: if the subject was outside of the community, his or her location was noted;
5. Visitors: if a household had visitors present, a "yes" is noted here, and the name, sex, and approximate age of the visitor(s) was noted;
6. Observer first: a more reliable time allocation observation has the investigator observing the subject first, as the subject may disguise or stop what he/she is doing once he/she sees the observer. Thus it is noted if the observation was "observer first" or "subject first";
7. Proxy data: for people absent from the dwelling at the time of observation, the investigator asked other available family members about their location and activities. Noted here is who gave the information, whether it was believed to be reliable, and if the investigator verified it.

Our data set includes both observations made by field researchers and second-hand reports of activities.

Of the total ethnographic study population of 677 individuals, 507 were at least age five and therefore included in the time allocation sample. There were a total of 5,694 household visits, generating 23,796 individual observations during the five-month period of the study. A total of 22,307 of these observations were of the resident population and an additional 1,489 were of visitors to the community, recorded at the time of observation (see Table 3 for how these observations were distributed in terms of community and ethnic group).

Possible limitations of the data include the circuit format, which may have reduced the randomness of household observations, as well as the impacts of seasonality, as the observations were conducted during a consecutive five-month period and did not encompass a full calendar year. One effect of seasonality has to do with precipitation. In the northeastern portion of the Ecuadorian Amazon, the months of March through July correspond to a peak of rainfall (with a smaller peak in October and November [Yost and Kelley 1983:219]), so only one month

Table 2
Time Allocation Codes for Registering Observed Behaviors

Primary Code	Specific Codes												Other
Subsistence Production (A)	AA	AC	AF	AH	AP	AR	AU						AX
Commercial Activities (V)	VA	VB	VF	VL	VM	VR	VT	VV	VU				VX
Domestic Tasks (Q)	QA	QC	QF	QG	QL	QN	QP	QQ	QR	QS	QU		QX
Social Activities (S)	SE	SF	SG	SI	SJ	SL	SM	SN	SR	SV	SZ	SU	SX
Individual Activities (I)	IC	ID	IE	IG	II	IO	IP	IT	IV	IU			IX
Outside Community (F)	FC	FM	FO	FU									FX
Unknown (U)													U

SPECIFIC CODES:
Subsistence Production (A_): A=raising of animals for primarily subsistence; C=production of crops for subsistence or exchange; F=production of perennials for subsistence; H=hunting; P=fishing; R=gathering forest items for food, construction, medicine, etc.; U=subsistence production unknown.
Commercial Activities (V_): A=agricultural production, raising animals or cattle for sale; B=receiving or soliciting state welfare; F=manufacture of items for sale; L=looking for paid labor; M=cutting, transport, or sale of wood; R=gathering non-timber forest products for sale; T=wage labor; V=buying, selling items; U=commercial unknown.
Domestic Tasks (Q_): A=collecting water; C=cooking or preparing food; F=manufacturing or repairing items for own use; G=processing food for storage (drying, smoking); L=cleaning; N=collecting firewood; P=pet care; Q=house care; R=washing; S=werving, transporting food; U=domestic unknown
Social Activities (S_): E-attending school or giving classes; F=party; G=recreation; I=attending church; J=playing sports; L=breastfeeding; M=communal labor; N=caring for children or other people; R=community meeting for communal, political, or ritual purposes; V=visiting; Z=healthcare; U=social unknown.
Individual Activities (I_): C=eating; D=sleeping; E=studying; G=recreation; I=illness; O=leisure, resting; P=personal matters; T=walking; V=dressing, washing, or going to bathroom; U=individual unknown
Outside of the Community (F): C=outside transporting items or individuals; M=outside for meeting; O=outside community living in another location; U=outside unknown.
Unknown (_U or UU)

of the ethnographic study (February) corresponds to the drier season. Thus, activity patterns presented here may differ from those exhibited during the drier months (August, September, January, and February). Also, the period of the ethnographic study corresponded to the academic year, during which families are probably more likely to be in residence in the community rather than going on extended forays (visiting, hunting, etc.) outside the village. Observations past 7:00 p.m. were not recorded due to safety concerns as well as social decorum (see also Baksh 1990). The lack of nighttime observations could skew the data a bit (e.g., men could be sharing in domestic work more in the evenings) but not dramatically change the overall picture.

ANALYTICAL APPROACH

Time allocation data are often used to make inferences about the ways in which populations and cultures differ with respect to their individual, social, and economic lives, and the magnitude of these differences. Standard usage of Null Hypothesis Significance Testing (NHST) in TA studies reveals whether or not differences in time use exist, but does not provide insights into the magnitude of those differences. This distinction is important to a number of analytical endeavors, and in these cases, many advocate confidence interval construction and interpretation as an alternative to NHST and the presentation of p-values (Gardner and Altman 1986). We contend that confidence intervals can be an informative tool for the interpretation of time allocation data. Our analysis of the time allocation data set involved calculating the frequency of observations made for each activity, then converting these counts to a proportion of time spent in each activity, the standard error for that proportion, and its associated 95% confidence interval (Bernard and Killworth 1993). In this article we present graphs of this data to describe patterns of time allocation inter- and intra-ethnically for the Shuar, Secoya, Quichua, Huaorani, and Cofán. Confidence interval graphs show the effects of error and chance on each estimate, allow us to infer the statistical significance of differences between populations, and enable us to estimate the magnitude and ethnographic import of these differences.

Error bars bounding each estimate provide a plausible set of values that consider sample bias. Overlap between the confidence intervals of two estimates indicates that differences between them are more likely due to error or chance at the level of confidence we have selected for our analysis (95%). This visual estimate is roughly equivalent to a two-sample test for differences in proportions. Where overlap does not occur, we use this as a proxy measure of statistical significance.[3] Large sample sizes result in narrow confidence intervals and high precision, which affords the power to detect small differences between groups.[4] As a result, statistical significance is often reported in large data sets. However,

we focus our findings on inter and intra-ethnic differences that are statistically significant (confidence intervals do not overlap) and have magnitudes great enough to constitute ethnographic importance. For our purposes, we consider a difference in time of 5% or more among general activity categories (e.g., subsistence, individual, commercial, domestic, and social) to be important ethnographically speaking.[5] In terms of testing the idea of the public versus private spaces, time allocation categories congruent with private spaces include individual, domestic, and subsistence, whereas categories indicative of the public sphere include social, commercial, and outside the community.[6]

FINDINGS

We discuss time allocation findings by first summarizing inter-ethnic differences overall (Figure 1) before turning to a discussion of intra-ethnic and inter-ethnic gender dynamics (Figure 2). Interpretation of confidence interval graphs is the basis for our inference of time allocation patterns and their significance. The discussion will focus on patterns of statistical and substantive significance.

Overall Comparison Between Ethnic Groups

Figure 1 shows the percent of time spent in each primary activity category by ethnic group. We start with the top category and work our way down. *Social activities* include attending school, parties, church, reunions, communal labor parties or inter-household labor exchanges, playing with others, playing organized sports, visiting, and care-related activities. It encompasses social activities primarily occurring within the community, but includes activities outside the community as well. For all ethnic groups, these activities represent the most dominant use of time during the sample period with proportions ranging from 36% for the Huaorani to 43% for the Quichua. The Quichua and Cofán appear to spend significantly more time in social activity than the other groups. Examination of the specific codes under the social category reveals differences in the types of activities: the Shuar community spent the most time of the five groups in school and the Quichua are slightly higher in their time dedicated to caregiving. The Secoya spent the most time in communal labor and community meetings. In contrast, distinct differences did not emerge for the ethnic groups in terms of activities such as recreation, having fiestas, attending church, breastfeeding, and healthcare.

Individual activities include eating, resting, sleeping, studying, individual recreation, walking, and hygiene. Across the ethnic groups, time spent in individual activities ranges from 19% for the Quichua to 27% for the Huaorani. No

strong pattern emerges in the time devoted to individual activities, with the exception of the Quichua, who spend significantly less time in individual activities than all other ethnic groups. Looking at the specific activity codes, the Quichua spend the least time in hygiene, and are also at the lower end of the distribution in terms of leisure.

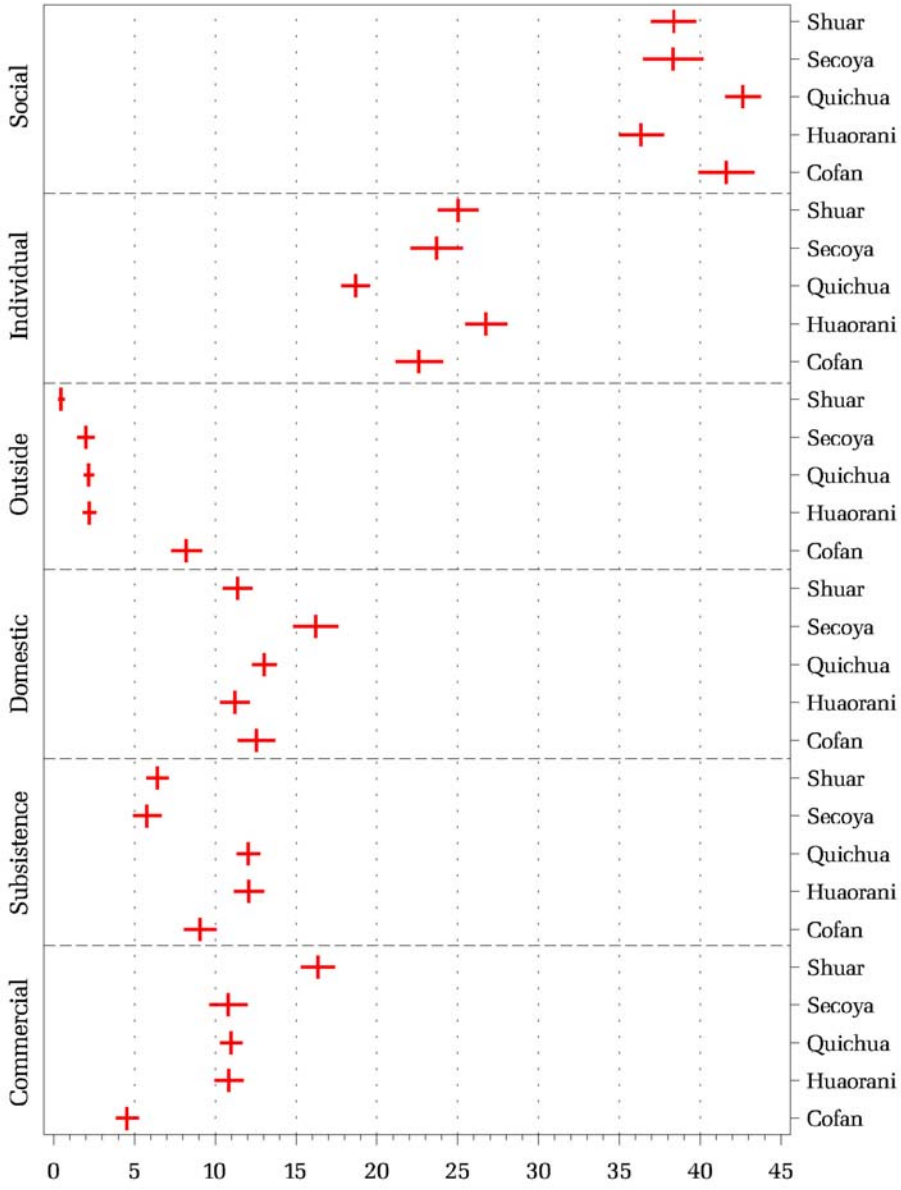
Outside activities are those that occur outside the boundaries of the designated study community and include transporting items or people, meeting individuals at another location, and living in another community at the time the observation was made. The Shuar spend the least amount of time outside (1%); the Secoya, Quichua, and Huaorani spend an intermediate level of time outside (3%); and the Cofán spend the most amount of time outside the community (8%).

Domestic activities include cooking or serving food, making or repairing items for household or personal use, collecting water or fuel wood, processing food for storage, household maintenance, washing clothes, and caring for small household pets. Time spent in these domestic activities altogether ranges from 11% for the Huaorani to 16% for the Secoya. The Secoya tend to be at the high end of the time distribution of domestic activities for tasks such as cooking, cleaning, washing, and item manufacture and repair.

Subsistence activities include agriculture and livestock-related tasks, hunting, fishing, and foraging. Observation of subsistence activities in Figure 1 shows three distinct and non-overlapping classes: the Secoya and Shuar spend the least amount of time in subsistence activities at 6% and 7%, respectively; the Cofán exhibit an intermediate level of time in subsistence at 9%; and the Quichua and Huaorani are the most oriented towards subsistence production at 12%. Interesting differences exist in types of activities preferred across ethnic groups. For instance, the Shuar are the most oriented towards livestock, whereas this activity is minimal for the other groups. The Quichua are the most dedicated to agriculture, followed by the Huaorani, with the remaining three groups about the same. The Huaorani have the most hunting orientation, followed by the Cofán. The Huaorani, Cofán, and Quichua fish more than the Secoya and Shuar.

Commercial activities involve the production, processing, and buying and selling of agricultural and livestock products, handcrafts, timber, forest products, or other manufactured goods, as well looking for wage opportunities, welfare assistance, or working for wages. The percentage of time in commercial activities ranges from 5% for the Cofán to 16% for the Shuar. Observation of commercial activity patterns in Figure 1 shows three distinct classes, with the Shuar the most engaged in commercial activities, followed by the Secoya, Huaorani, and Quichua (at about 11%), with the Cofán the least engaged. Examination of specific activity codes reveals that the Shuar spend almost double the time of the next ranked group in wage labor.

Figure 1
Percent Time Spent in Primary Activities



Gender Differences Within Ethnic Groups

In this section, we seek to test whether, for a given ethnic group, females exhibit significantly different patterns of time allocation than males. Specifically, we seek to test whether females spend more time in the private sphere (represented by the categories individual, domestic, and subsistence) whereas males spend more time publicly in terms of social and commercial activities and time outside the community.

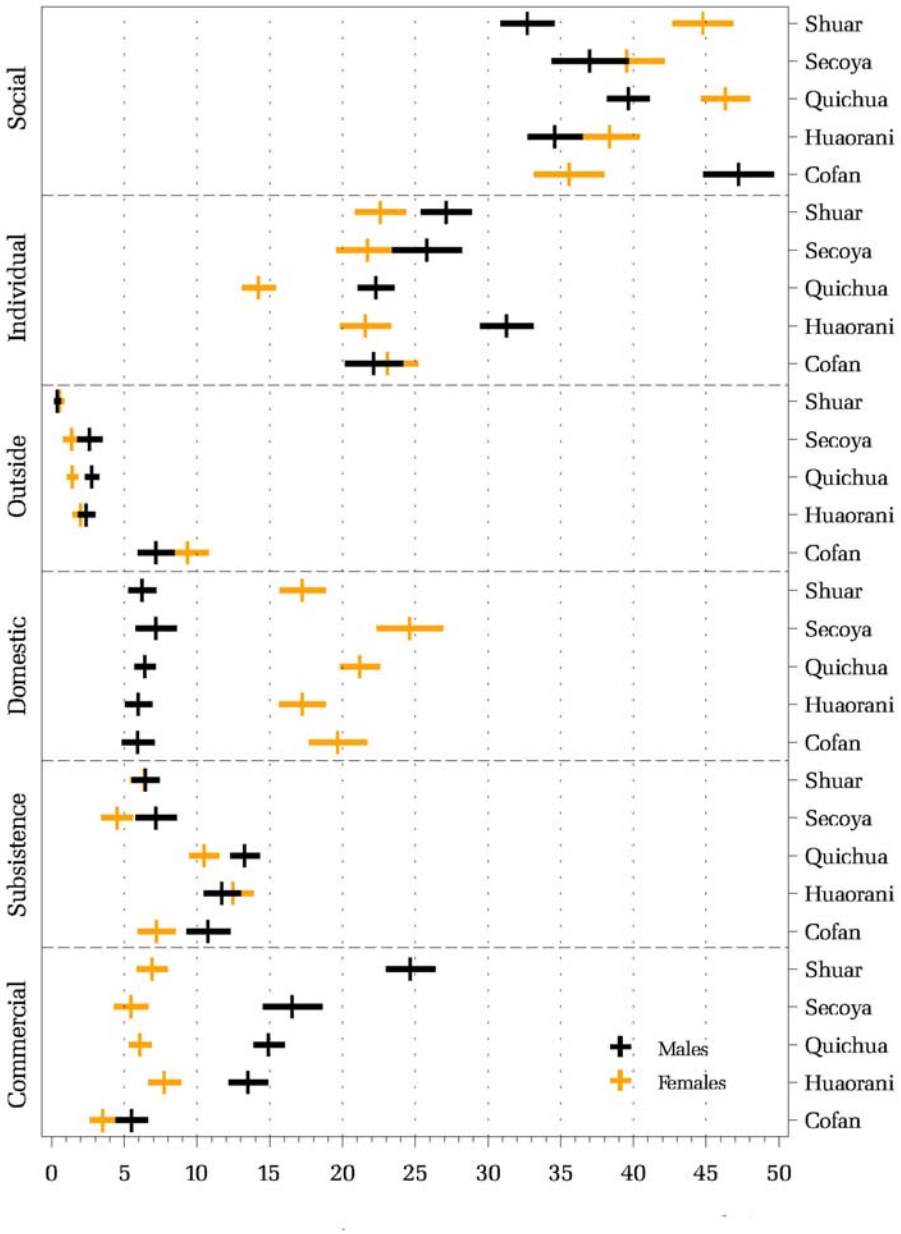
Intra-ethnic differences in the private sphere. For the Shuar, Quichua and Huaorani, males spend more time in individual activities than females. For the Huaorani and Quichua, this difference is mostly attributable to the increased leisure males have compared to females of those ethnic groups. For the Cofán and Secoya, the difference is not significant.

The most striking and consistent difference between gender roles is that for every ethnic group, females spend three to four times more time in household chores and domestic activities than males. Male domestic activity is minimal and ranges from 6% for the Huaorani to 7% for the Secoya, whereas female domestic activity ranges from 17% for the Shuar and Huaorani to 25% for the Secoya. This is the strongest evidence found in support of the idea that females are relegated to the private sphere.

Intra-ethnic comparisons of males and females show that the amount of time spent by males in subsistence activities is slightly higher than females in all ethnic groups but the Huaorani, where female subsistence activity is slightly higher. This is attributable to the higher amount of time Huaorani females spend in agriculture as compared to Huaorani males. However, confidence intervals overlap, indicating that gender differences overall are not significant among the Huaorani or the Shuar. Differences between males and females among the Secoya are slight at only 3%, among the Quichua at 3%, and among the Cofán at 4% in terms of the greater time that males work in subsistence tasks compared to their female counterparts. An examination of the specific activities under the subsistence category reveals that time dedicated to livestock raising, perennial crops, and foraging for subsistence does not differ by gender intra-ethnically. For all groups, males hunt much more than females, but fishing is male-dominated only among the Quichua. The most pronounced difference is in agriculture among the Huaorani, where females spend 5% of their total time compared to males, who spend only 1%.

Intra-ethnic differences in the public sphere. Females of all ethnic groups spend more time being social than males in the same ethnic group, with the exception of the Cofán. This pattern is only significant though when comparing

Figure 2
Percent Time Spent in Primary Activities (by Gender)



males and females of the Shuar and Quichua. Among the Secoya and Huaorani sampled, males and females spend similar amounts of time in social activity. For the Cofán, the inverse is observed, with Cofán males spending more time in social activity than Cofán females. The two social categories in which a gender division is most apparent are care-giving and breastfeeding. Cofán males and Secoya males spend more time than their female counterparts in sports and communal meetings, respectively. Shuar females spend more time than Shuar males in healthcare. For the remaining specific codes under the social category, male and female activities are similar.

Males spend significantly more time in commercial activities than females in every ethnic group except the Cofán. Gender differences in commercial activity are most pronounced among the Shuar and increasingly less pronounced as we proceed through the Secoya, Quichua, and Huaorani. Shuar males spend 18% more time in commercial activity than Shuar females; Secoya males spend 11% more time than Secoya females; Quichua males spend 9% more time than Quichua females; and Huaorani males spend 6% more time than Huaorani females.

In terms of time spent outside the community, gender differences within each ethnic group were not found.

Gender Differences Between Ethnic Groups

In this section, we test whether females in more egalitarian groups (Secoya, Cofán, Huaorani) tend to engage in more public activities than females in more male-dominated groups (Shuar, Quichua). Conversely, do males in more egalitarian groups tend to spend more time in the private sphere than males in more gender-stratified groups?

Inter-ethnic differences in the private sphere. Female individual activity ranges from 14% for the Quichua to 23% for the Cofán. Among females, the Quichua spend the least amount of time in individual activities compared to all other ethnic groups, and this reflects the fact that Quichua females are at the low end of the time distribution in sleeping, leisure, and hygiene.

Male individual activities range from 22% for the Cofán to 31% for the Huaorani. Among males, it is the Huaorani who spend significantly more time in individual activity than all other groups, which is solely attributable to how much more leisure they have.

Observation of confidence interval overlap in Figure 2 shows no differences in the amount of time males spend in domestic activity across ethnic groups. Female domestic activity is significantly higher and with a greater range, from 17% for the Huaorani and Shuar to 25% for the Secoya. Secoya females spend

significantly more time in domestic activities than Shuar, Huaorani, or Cofán females.

Among females, the Secoya, Shuar, and Cofán spend less time in subsistence activity than the Quichua and Huaorani. Secoya females spend 5% of their time in subsistence, Shuar females spend 6%, and Cofán females spend 7%, compared to Quichua females who spend 11% and Huaorani females who spend the most, at 12%. Quichua and Huaorani females spend more time in agriculture than females in other groups, and Huaorani females hunt more to provide food for their own consumption than other females.

Shuar and Secoya males spend less time in subsistence activity than males of all other ethnic groups, at 6% and 7%, respectively. In comparison, Cofán males spend 11%, Huaorani males 12%, and Quichua males 13%. The latter results from Quichua males spending more time in agriculture than males of the other ethnic groups, and the fact that Huaorani males hunt more than Quichua, Secoya, or Shuar males, and fish more than Secoya or Shuar males.

Inter-ethnic differences in the public sphere. Considering only females in terms of social activities, two distinct classes emerge. Shuar and Quichua females spend 45% and 46% of their time in social activity, respectively, which is significantly greater than Cofán, Huaorani, and Secoya females who spend between 36% and 40%. Shuar females spend the most time in schooling of all the groups, and Quichua females spend the most time in care-giving activities.

Cofán males spend significantly more time in social activity than males in the four other ethnic groups, at 47%. This finding is directly attributable to the fact that some Cofán males are temporarily living in Quito (and one is living in the U.S.) attending school; therefore, all the observations for these people were coded as educational activities. Of the remaining ethnic groups, Shuar, Huaorani, Secoya, and Quichua males spend 32%, 35%, 37%, and 40% of their time, respectively, in social activities. Examination of confidence intervals suggests that although means differ, these differences may be due to chance and are therefore indistinguishable from one another.

Male commercial activity ranges from 6% for the Cofán to 25% for the Shuar. Observation of confidence interval overlap for males shows three distinct classes: Cofán males with the lowest time in commercial activities; Huaorani, Quichua, and Secoya at an intermediate level; and Shuar with the highest involvement in commercial activities. This stratification among indigenous males in commercial pursuits is largely influenced by one activity: wage labor. Among indigenous populations in the Ecuadorian Amazon, wage labor opportunities are limited and mostly available to men (e.g., working for an oil company, which is one of the most important sources of wages for these groups).

Female commercial activity ranges narrowly from 4% for the Cofán to 8% for the Huaorani. In terms of specific activities, Huaorani females manufacture crafts for sale more than any other ethnic group or gender, while Shuar females spend more time in wage labor than other females.

Regarding time spent outside the community, Cofán males and females spend a bit more time away from their villages than the other ethnic groups, likely due to the greater distances they need to travel to visit their relatives or get to market towns. Differences between Shuar, Secoya, Quichua, and Huaorani were not significant.

SUMMARY OF FINDINGS

Overall, for these indigenous groups, the most important category (between 35–45% of time use) is social activities, the process of socialization, education, and formation and maintenance of interpersonal and community relationships. This is followed by individual activities (approximately 20-30% of time spent), involving the care and maintenance of the individual's body and mind. Production activities, both for market and subsistence, as well as the related category of domestic activities, constitute between about 5 to 15% of total time observed. In the most general terms, then, the Shuar, Secoya, Quichua, Huaorani, and Cofán share similar patterns in their time allocation, which can be seen in the clustered pattern of confidence intervals within each activity category across the indigenous groups.

Nevertheless, there are some slight inter-ethnic differences. The Shuar stand out in terms of having the most time dedicated to commercial production, and one of the least in terms of subsistence time. The Secoya spend more time in domestic activities than the other groups, are intermediate in terms of commercial production, and low in subsistence. The Quichua are relatively high in terms of social activities, lowest in terms of time spent in individual activities, have an intermediate commitment to the market and one of the highest time commitments to subsistence. The Huaorani have a similar commercial/subsistence profile as the Quichua (except that their commercial activities are mainly working for oil companies, while for the Quichua it is cash cropping), but are more oriented towards individual activities than social ones. Finally, the Cofán are near the upper end of the distribution in terms of social and individual activities, have an intermediate level of time spent in subsistence, but the lowest in terms of commercial production.

In terms of gender differences between males and females of the same ethnic groups, certain gender differences stood out. In terms of the private sphere, Huaorani males have substantially more leisure (individual activity category) than Huaorani females, and this pattern holds true but to a lesser degree for the

Quichua. Indeed, females of all five ethnicities spend much more time doing domestic work than males, especially cleaning, washing clothes, cooking, and serving food. The only domestic activity where the pattern is reversed is for manufacturing and repair of domestic items. In subsistence activities, gardening is a predominantly female activity among the Huaorani, with the other groups not showing gender differences in time allocation. Hunting for all groups is male-dominated, especially for the Huaorani and Cofán.

Regarding the public sphere, Shuar females were found to engage in more social activities than males, but for the Cofán it is the reverse, and both findings pertain to time spent in schooling. For commercial activities, males of each ethnic group spend more time in wage labor—a pattern most pronounced for the Shuar and least for the Cofán. For time spent outside the community, intra-ethnic gender differences were not found for any of the groups.

Inter-ethnically, we tested the hypothesis that in more egalitarian groups (Secoya, Cofán, and Huaorani) we would see a relaxation of the premise that females dominate the private sphere and males the public sphere. We presumed that this division would be reinforced for the two more gender hierarchical groups of the Shuar and Quichua. For the private sphere, in individual activities, female time allocation was either indistinguishable from males (Shuar, Secoya, Cofán) or substantially less than males (Quichua, Huaorani). In domestic tasks, males spent much less time in household chores than females across the board. In subsistence activities, Shuar and Secoya males spend less time than males of other groups, while Quichua and Huaorani women spend more time in subsistence than women of other groups. For the public sphere, Shuar and Quichua females are more social than females of other groups, counter to the prediction since females of these groups were predicted to be more firmly in the private sphere due to their greater gender hierarchical nature. For commercial activities, Shuar males come out on top, Cofán on the bottom, and the other groups intermediate, whereas for females it is not well differentiated. Finally for activities outside the community, Cofán males and females spend more time away from the village than members of the same sex in the other groups. Little support is thus found for the prediction that the private/public sphere dichotomy would be more relaxed among the more egalitarian groups. Either the directionality was opposite to the prediction, or findings were not aggregated according to groups considered more egalitarian (i.e., Cofán, Huaorani, and Secoya) or more hierarchical (i.e., Shuar, Quichua).

DISCUSSION

This article focuses on two general topics pertaining to indigenous time allocation: (1) a methodological point about the collection, analysis, and utility

of such data, and (2) a cross-cultural analysis of time use overall, as well as an examination of the public/private dichotomy in understanding gender dynamics. In this discussion section, we will first address the methodological point.

It is known that time allocation study is a powerful tool for understanding human behavior, production patterns, and divisions of labor. Previous time allocation studies, however, have usually reported mean percentages of time (or mean hours and minutes per day) dedicated to specific activity codes, without reporting the variances. This is particularly problematic when considering the small sample sizes of some of these studies, which tend to lead to larger variances or a wider spread in observations. For instance, Johnson's (1975) classic study of the Machiguenga had 3,495 spot-check observations, and Santos et al.'s (1997) study of the Xavánte, using the same technique as Johnson, compared 477 spot-check observations made in one time period with 567 made in another. Even when statistical tests are run to determine the significance of differences in time allocation, they are based on null hypothesis significance tests (e.g., a t-test), which has increasingly come under criticism. Central problems with null hypothesis testing are that it is often uninformative, the selection of α-level is arbitrary, and there are inferential problems inherent in the p-value since it is dependent on sample size and hence overstates the evidence against the null hypothesis in small samples (Anderson et al. 2000).

Our study of eight indige-nous communities encompassing five ethnic groups is based on a data set of nearly 24,000 observations, avoiding the problem of small sample sizes. However, such a large sample can raise the opposite problem with null hypothesis testing, since the p-value for rejecting the null hypothesis is dependent on sample size, so that one can often reject a null hypothesis with a large enough sample, even if the true difference is trivial. Thus, we present our findings as confidence intervals, an innovative alternative for time allocation data that makes clear the magnitude of differences between observations of activity codes.

Inter-Ethnic Differences: Surprising Consistency

Moving from the methodological point to the conceptual focus of the article, we examined whether these five diverse lowland populations significantly vary in their time allocated to broad categories such as commercial, social, and domestic activities. The five study populations encompass significant linguistic, social, demographic, and cultural diversity: population sizes varying from under a thousand to over 60,000; groups with only fifty years of sustained peaceful outside contact to ones whose ethnogenesis stems from the Conquest; and groups who have called the northern Ecuadorian Amazon home since time immemorial to ones who have recently migrated there. Nevertheless, despite hypothesizing

wide divergences in time allocation, we found considerable consistency in the percentage of time spent cross-culturally in most activity categories. What could explain this result?

One possible explanation is the household mode of production in which each of these groups has continued to be, to an important degree, dependent on agricultural subsistence. Perreault (2005) documents that for the lowland Kichwa community of Mondayacu in the Ecuadorian Amazon, household swidden garden (*chacra*) production has remained important (and cultivar diversity high) despite three decades of growing market integration. He argues that these households have not forsaken their chacras because of their central role in food security and cultural identity. The maintenance of a mixed economy encompassing both subsistence and market production, in addition to the demands of domestic chores, perhaps renders little room for wide variation in time allocation among these Amerindian populations. However, the large percentage of time spent in social activities found for these groups begs the question of why they would not just allocate more time to productive activities at the expense of social endeavors? Descola's (1994) study of the Jivaroan Achuar of the Ecuadorian Amazon may provide an insight. He found a relative inelasticity of time expenditure in labor and production for both males and females, and "this stability is not affected by otherwise wide local fluctuations in the availability of natural resources, in the quality and size of gardens, in the work force of the domestic unit, and in the number of consumers" (Descola 1994:204). He concludes that there is a "native norm" of the distribution between work and leisure, such that there is an upper limit to the amount of time devoted to material reproduction. Both possible explanations require further examination to help explain the cross-cultural consistency shown by the data.

Gender Dynamics through the Lens of Time Allocation

We also tested the idea of the "public" versus "private" sphere as an explanation of the gendered division of labor and space among these five indigenous populations in the northern Ecuadorian Amazon. In the conception of the public versus private sphere, females are presumed to have less economic and political power and occupy the private sphere, the domain of domestic and individual affairs, whereas males occupy the public sphere that correlates with civic affairs and work at higher social scales and in spaces outside the home. This premise stems from women's role in reproduction and childcare, responsibilities that not only increase their energy expended (i.e., in pregnancy, childbirth, breastfeeding, and physically carrying around small children), but also restrict them by placing severe restraints on their mobility, thus limiting both their productive activities and their participation in social activities. Within an ethnicity, do females spend

more time than males in the private sphere (operationalized here in terms of the time allocation categories of individual, domestic, and subsistence), and do males dominate the public sphere (as represented by social activities, commercial production, and time outside the village)? Additionally, after characterizing the degree of egalitarianism among the ethnic groups, we asked whether the female-as-private-sphere and male-as-public-sphere dichotomy holds more strongly for groups characterized by a high degree of gender hierarchy (in this case, the Shuar and Quichua).

For these Neotropical indigenous populations, support for the public/private sphere concept is mixed at best. The strongest adherence to the idea that females are relegated to the private sphere is found in intra-ethnic patterns of domestic activities. For every group studied, females spend significantly more time undertaking household chores than males, by a factor of three or four in every group. However, the other private spheres of time allocation categories do not lend support for the hypothesis of female bias. For individual activities, there is either no difference between the sexes intra-ethnically, or a slight bias in favor of males. As leisure and daytime naps were incorporated in this category, however, this could be interpreted as males being able to take it easy while females work more. Similarly, in terms of time dedicated to subsistence, we found either no gender difference, or a slight bias towards males, running counter to predictions of the public/private sphere dichotomy. In terms of the hypothesis that males predominate in the public sphere, we found support for this only in the category of commercial activities, and for four of the five groups (not including the Cofán). There was not a consistent pattern of males engaging in more social activities than females, or of males spending more time outside the community.

Inter-ethnically, support for the private/public, female/male dichotomy is even weaker. We did not find support that among the more egalitarian groups (Secoya, Cofán, and Huaorani), females had more access to the public domain than females of the more hierarchical Shuar and Quichua. If anything, for the category of social activities, females of the more hierarchical groups spend more time socializing than males, whereas for the more egalitarian groups, it was either the same or male dominated, which runs counter to the prediction. So while females in these Amerindian groups undertake the bulk of domestic tasks and males (with one exception) interface more with commercial economic activities, we do not find support for male dominance of the public sphere or female relegation to the private sphere being especially pronounced for hierarchical groups.

Beyond the Dichotomy of Public versus Private

However, notions of inside/outside, private/public are not perhaps limited to literal spaces or types of tasks, but more symbolic and cultural ideas of realms of encounter and experience, as can be seen by the Cashinahua case study. Kensinger's (1989:18) study of the Peruvian Cashinahua examines the relationship between hunting, female sexuality, and the assertion of males' "natural superiority" over women. He writes:

> [M]en are responsible for external relations with other Cashinahua villages, other tribal peoples, and foreigners . . . . Cashinahua males clearly dominate the public arena and assert their right to do so based on their superiority over women . . . unlike men, women are spatially restricted to the village. They leave the village only in the company of their husbands or other women and cannot visit other villages without a male escort. (Kensinger 1989:25)

While clearly supporting the notion of men in the public realm and females in the private domain and the power inequities that implies, Kensinger also acknowledges the considerable influence women have from behind the scenes (e.g., consulting on relations with outsiders or influencing ritual practice) and the autonomy they possess:

> When a woman is unsatisfied by her relationship with her husband, she may terminate the relationship by putting his possessions outside their house. She keeps the house and the gardens, and has custody of their children until they are old enough to leave her care. Her husband does not own her. And, should he order her to do something, he has no assurance that she will acquiesce. Theirs is a reciprocal relationship, a relationship between opposites but equals. . . . Thus, within the contest of mutual interdependence characteristic of Cashinahua male-female relationships, the high value given to meat and hunting becomes both the symbol and the justification for male leadership, but not male domination. (Kensinger 1989:26)

Not only can women exert powerful political influence from the home, but the equating of house as "private" space, and thereby not political, limits how power relations are visualized. In their ethnoarchaeological study of "domestic spaces as public spaces," Bowser and Patton (2004) examine the spatial relationships, social distances, and spatial organization of men and women's visiting areas among Achuar and Quichua-speakers in the Ecuadorian Amazon. They find that on a daily basis, political discourse occurs in the home, transforming it from a context of family sociality to a space which includes political life. The boundary, therefore, between public, political life and private, domestic life is often indistinguishable, inextricably intertwining males and females in complementary ways.

In her study of gender and sociality among the Cashinahua, McCallum takes a more in-depth examination of the creation of gendered difference through the

acquisition of male and female agency which is characterized by a "complementary opposition between economic and social processes . . . . Women's learning takes place, socially and geographically, on the 'inside', while men's learning often involves relationships with beings and spaces linked to the 'outside'" (2001:48). Women control the production and circulation of food between houses and settlements, and the production and transformation of babies. "Men, for their part, fetch things from afar. They bring back game and fish from the forest and river, manufactured items and foreign knowledge from the city" (McCallum 2001:65). The "inside" is the space where kinship and humanity are locked together, where peaceful generosity among kin, amicable sociality, and male-female affinity occur. The "outside" refers to relations with Others (e.g., game animals, non-Cashinahua, deities, or spirits) and the space where interactions are characterized by seduction, repulsion, trickery, predation, and violence. The outside (like the inside) is not so much a term denoting a fixed physical space, then, as a concept referring to certain relationships and spaces of interaction. The study of divisions between male/female, public/private, outside/inside, and political/domestic thus requires a multifaceted approach blending norms and behavior, the symbolic and literal, to which diverse approaches within anthropology could be fruitfully applied.

NOTES

1. This research was supported by a grant from the National Institutes of Health (R01-HD38777-01, June 1, 2000–May 31, 2003) to the Carolina Population Center, University of North Carolina at Chapel Hill. We gratefully acknowledge the hard work and support of our field research team and collaborating institutions in Ecuador: CEPAR (Centro de Estudios de Población y Desarrollo Social) and Ecociencia (Fundación Ecuatoriana de Estudios Ecológicos). We give special thanks to Ana Isabel Oña, Alicia Ruiz, Francis Baquero, Gabriela Valdivia, Gustavo Rodriguez, Steve Walsh, Brian Frizzelle, Bruce Winterhalder, Rhea Phillips, and Barker Fariss. Most importantly, we express our deep gratitude to the people of the participating indigenous communities and federations for making this research possible.

2. Egalitarian as used here refers to societies that lack centralized authority and in which there are no sharp divisions of rank, status, and wealth. Hierarchy implies the existence of inequalities among persons in terms of their social organization or interpersonal relations. Both terms have a contested history in the anthropological literature (Flanagan 1989).

3. A graphical comparison of individual confidence intervals is not identical to carrying out significance tests. Here we construct individual confidence intervals as opposed to the alternative of calculating a confidence interval for the difference itself. The latter is more powerful at detecting differences, but depends on the degree of homogeneity of variances in the two estimates. This assumption is violated in our sample, primarily because the number of observations differs greatly across ethnic groups. As a result, there is a lack of direct correspondence between visual interpretation of confidence interval overlaps and statistical significance tests. Our approach leads to a more conservative determination of significant differences in comparisons with slightly overlapping confidence intervals. Due to the relatively high precision surrounding our estimates, if confidence intervals were to slightly overlap leading

to declaring the difference as statistically insignificant when in fact it was significant, the actual difference may still not be of ethnographic importance.

4. With a total of 23,786 observations, fairly high levels of precision (small variances) are possible in estimates of means for general activity categories by ethnic group (see Figure 1). But once we disaggregate by gender (Figure 2) or specific activity codes, numbers of observations are much reduced, which increases error in the estimate of the mean, resulting in larger confidence intervals and less ability to detect small differences between groups.

5. An ethnographically important difference was set at 5% or greater of the times for general activity categories. This equates to an overall difference of approximately a week or more over the five-month study period from February through June, or a daily difference of nearly an hour over the 13-hour observation day.

6. Another primary activity code, which is not included in the discussion, is "Unknown." This includes the total of all individual observations for which a primary activity code could not be determined. Percentages of unknown activity are very small for all ethnic groups, reaching as high as 3% only for the Secoya. Other ethnic groups range from 0.4% to 2%. As a result, percentages of time reported for the remaining primary activities do not sum to one.

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