The Sexual Division of Labor

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Abstract

Many evolutionary arguments fossilize a human division of labor as one of man the hunter, and woman the gatherer, with differences in labor arising out of the effectiveness of efficiency. We suggest here that arguments based solely on the efficiency of labor specialization among heterosexual married pairs over-generalize divisions of labor that are, in reality, much more diverse. Divisions of labor can be based on age, as well as on gender, and are not limited solely to monogamous marital pairs. Divisions of gender take the form more generally not of meat and vegetables, but of the acquisition of high and low variance foods. Some differences in labor may be the result of conflicting interests, others emerging from common goals, and still others from the power of patriarchy. Differences in labor patterns may not be designed solely, or even primarily, to provision children, but may also be shaped by the social goals of both sexes.

INTRODUCTION

While many other animals exhibit sex and age differences in behavior and the use of natural resources, humans seem to be unique in the extent to which such differences can be strategically utilized as a form of cooperative mutualism. The standard story suggests that human individuals with particular advantages for certain tasks can team up with others who specialize on alternatives and share the resulting products; the end result can provide a more efficient outcome for all. When behavioral differences involve cooperative specialization in economic production or reproduction, we usually refer to the outcome as a *division of labor*. It is considered such a pervasive, unvarying trait that the human lineage has become defined by a singular division of labor that has evolved to take the form of men hunting and women gathering—leading to the contemporary equivalents of men bringing home the bacon and women specializing in housework and childcare—a division that naturally is considered more efficient than other options. This review moves beyond this stereotyped perspective to argue that there is no "human sexual division of labor," but rather, there are

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"divisions of labor," of which some may be based on gender. We suggest that while divisions of labor based on gender are particularly visible in most human communities, cooperation is possible between any two individuals. In recognizing the role of conflicting interest in family formation and production, we suspect that not all differences in labor are patterned by cooperative mutualism or based solely on considerations of economic efficiency.

Cross-cultural surveys of gender difference in labor tend to find both a common patterning and tremendous diversity. In nearly every (nonindustrialized) society in the Ethnographic Sample (Murdock & Provost, 1973), hunting large animals, metalworking, and cutting trees are nearly always predominantly male-dominated; surveys of labor occupations in industrialized countries show that not much has changed: according to the Bureau of Labor Statistics (www.bls.gov), loggers (8.5% female in the United States in 2010), metalworkers (15.2% female), and fishers, hunters, and trappers (12.5% female) are predominantly men. Domestic cooking, laundering, and childcare in nonindustrialized societies are nearly always performed predominantly by women, and most surveys in industrialized countries too show that domestic labor is predominantly female: employed women do about 70% of the household labor, and unemployed women more than 80%. Yet some activities in Murdock's sample are not predictably dominated by a single sex: loom weaving, milking domesticated animals, and hunting small animals swing from being predominantly male in some regions of the world to predominantly female in others. Many other types of productive labor are more evenly split, even within a single society: men and women often share the labor of gardening, agriculture and animal husbandry.

The greatest focus of gender differences in labor is on subsistence work, and although much has been written on gender differences in agricultural production, this review is primarily interested in the factors that affect hunting and gathering decisions in small-scale societies. The broad patterning of gender difference in hunter-gatherer foraging decisions is well-known: men tend to spend much more time hunting for large prey, women in gathering plant foods and caring for young children. But moving beyond such stereotypes reveals a great deal of variation in the extent to which women are involved in hunting activities, and men in gathering. Women frequently hunt deer among the Agta (Goodman, Griffin, Estioko-Griffin, & Grove, 1985) and Ainu (Watanabe, 1968) and caribou among the Chipewyan (Jarvenpa & Brumbach, 2006). Central African women hunt for duikers and forest pigs (Noss & Hewlett, 2001), while Australian Aboriginal women provide meat from lizards and cats (Bliege Bird & Bird, 2008). Mixed gender communal hunts for rabbits were common among Shoshone (Steward, 1938). In other societies, women do very little hunting themselves: Aché

women work to support men's hunting trips and occasionally cooperate with spouses in acquiring armadillos (Hurtado, Hawkes, Hill, & Kaplan, 1985), Hadza women are prodigious producers of vegetable foods but do no hunting at all (Hawkes, O'Connell, & Blurton Jones, 1997), and while !Kung women may assist hunters in tracking game, they rarely get it themselves (Biesele & Barclay, 2001). However, even where women are not active hunters, their labor and skills are often crucial for preparing the hunt and processing the catch into food, clothing, and other materials (Jarvenpa & Brumbach, 2006). With respect to infant care, in some societies mothers are the main caretakers (A. M. Hurtado, Hill, I. Hurtado, & Kaplan, 1992), but in many, like the Efe (Ivey, 2000) and Martu (Scelza, 2009) caretaking is accomplished by many others in addition to mother. Likewise, men do not always fit easily into the stereotypical role of big game hunter: men in nearly all hunter gatherer societies collect honey, !Kung men bring home gathered foods when unsuccessful at hunting (Lee, 1979) and Aka men spend a great deal of time caring for infants (Hewlett, 1987).

Adequate understanding of the division of labor requires explanations that incorporate these departures from the norm, difficult when most contemporary models assume a normative perspective on the division of labor. Explanations for gender differences in labor fall under three main categories, what we will call here the "power of patriarchy," the "effectiveness of efficiency" and "actions of agency."

Power of patriarchy arguments take as given that any departure from equity in work performance or decisions about types of labor to pursue is evidence of power differentials between the sexes caused by institutionalized sexism. Common in gender studies, sociological and feminist approaches to the division of labor, this perspective suggests that contemporary work differentials between men and women result from historic inequities that set persistent constraints for women's decision-making (Leacock, 1981). The power of patriarchy creates assumptions about household hierarchies that presume males dominate decision-making, forces stereotypes about women's work and motherhood, and shoehorns women into low-status, low-reward forms of productive labor that exclude them from access to power and prestige. Under patriarchy, the benefits of a division of labor go mainly to men, and in the absence of patriarchy, the default labor pattern would presumably be one of little difference between the sexes.

Effectiveness of efficiency arguments do not ignore the power of patriarchy, but assume that differences in male and female labor are adaptive at the household or societal level not just for men, but for women as well: that is, they are the result of cooperative specialization (Burton, Brudner, & White, 1977; Kaplan, Hill, Lancaster, & Hurtado, 2000). These explanations rely heavily on formal economic models of labor specialization (Becker, 1985).

These models propose that women have an intrinsic comparative advantage over men in the production and care of children, which sets an initial condition that leads to differentiation in the economic and household tasks that men and women pursue. Over time, these build into cooperative specializations that lead men and women to develop human capital in different arenas, which only continues to reinforce this trajectory.

Actions of agency models depart from the normative perspective and focus not on "divisions" but on "differences," presuming that individuals are free to make choices about their time investment in different forms of productive labor. These choices are conditioned by differences in individual constraints, trade-offs, and opportunities, as well as by the decisions of others around them (Elston & Zeanah, 2002; Zeanah, 2004), and thus are well-suited to explain the vast array of diversity in gendered labor decisions. While choice models figure into force of efficiency arguments as well, the main difference here is the level at which benefits are realized: in actions of agency models, individuals do better by choosing different labor strategies, while in effectiveness of efficiency models, it's the household (or larger cooperative group, such as the firm or society) that benefits. Agency models are agnostic about cooperative mutualism.

FOUNDATIONAL RESEARCH

Evolutionary scenarios of the origins of the human division of labor stem from three influential treatments: Washburn and Lancaster's Hunting Hypothesis (Washburn & Lancaster, 1968), Alexander and Noonan's model of the evolution of concealed ovulation (Alexander & Noonan, 1979) and Owen Lovejoy's Provisioning Hypothesis (Lovejoy, 1981). In the "Man the Hunter" volume, Washburn and Lancaster argued that the human family arose from the habitual sharing between male hunters and female gatherers, and that cooperative hunting by males defined the traits that make one human. Alexander and Noonan proposed that concealed ovulation evolved in females to secure parental investment from males for increasingly dependent offspring. In Lovejoy's model, which does not necessarily involve hunting as a male prerogative, early hominids became human through the adoption of monogamy and male provisioning. Walking upright allowed males to carry food back to their pair-bonded females, who could reduce their foraging effort and concentrate on looking after children. In response, critics pointed out the importance of female gathering (Dahlberg, 1983), the possibility that concealed ovulation evolved instead to confuse paternity and reduce infanticide risk, rather than secure investment (Hrdy, 1999), the unpredictability of hunting as a means to provide for daily consumption (Hawkes, 1990), the limitations of the nuclear family concept (Hawkes,

O'connell, Jones, Oftedal, & Blumenschine, 1991), and the importance of intergenerational cooperation in feeding offspring (Hawkes *et al*., 1997).

Yet few have questioned why there might be differences in labor between males and females in the first place. The long-standing assumption has been that divisions of labor stem from women's childcare constraints. In the 1970s Judith Brown, George Murdock, Douglas White, and others, argued that women were unlikely to engage in activities that offered profound incompatibilities with simultaneous childcare, that were dangerous, or took women too far from home (Brown, 1970; Murdock & Provost, 1973). Hunting was associated with all of these things.

Hurtado *et al*. (1992) later refined this hypothesis to propose that a combination of constraints and tradeoffs between caring for, and provisioning offspring were primarily responsible for how much time women spent in particular subsistence activities. Their work focused on studies of South American foragers, the Aché and Hiwi, noting that among both, women spent little time foraging compared to men, but produced much more when older women could dig roots, and when younger women with infants could pick fruit. Yet questions remained: if women foraged differently than men because they were more often looking after infants, why then did women without young children, and postmenopausal women, not forage more like men? Why did postmenopausal women, in particular, shift to roots when seasonally productive rather than hunt as men did? Hurtado and Hill proposed a few alternative "effectiveness of efficiency" explanations. One suggests that differing tasks by gender provides nutrient complementarity between men and women, with men bringing in more protein and women more carbohydrates (Hill, 1988). Another follows Becker's model in suggesting that because of women's childcare constraints, long-term investments in men's capital resulted in higher hunting gains for men, assuming hunting requires more skill and provides higher returns than gathering (Gurven & Hill, 2009).

While these hypotheses have proven fruitful in stimulating discussion, they may account for divisions of labor in some places, but not others. Women do hunt, men and women are equally productive in many societies, and there is no evidence that hunting large game requires more skill than the types of foraging women typically do. Likewise, there are many cases where nutrient complementarity does not appear to characterize the suite of men's and women's resources, especially where women hunt or procure high protein, high fat nuts and seeds. For Kristen Hawkes and colleagues (Hawkes, 1991; Hawkes, O'Connell, & Blurton Jones, 2001), the answer to why men and women make different subsistence choices lay in the fact that some forms of hunting may not be as productive or as predictable as previously thought: acquisition failure is often quite high for large game and the products of hunting are often widely shared beyond the family. Their work with Hadza

hunter-gatherers in Tanzania brought these paradoxical trends to light: why would men continue to hunt large game if their acquisition was unlikely and even when a hunt was successful, most of the meat would go to others beyond the family? Hawkes and colleagues suggested that this pattern may be explained as show-off behavior, indicating that men and women were operating with different currencies in mind. While women may have been maximizing energetic efficiency with the acquisition of plants (especially tubers), men were focused on maximizing preferential social attention.

This model was later formalized with the incorporation of costly signaling theory to explain why Meriam men preferred to spear fish rather than collect shellfish and hunt sea turtles for public feasts even when they could be collected at lower cost from nesting beaches (Bliege Bird, Smith, & Bird, 2001; Bliege Bird, Bird, Smith, & Kushnick, 2002; Bliege Bird & Smith, 2005; Bliege Bird, 2007). As a seasonal resource, the costs and benefits of sea turtle hunting vary intra-annually. During the nesting season when turtles come onto shore, they are easily acquired by men, women and children, with the meat and eggs going mostly to the acquirer's households and neighbors. During the mating season when turtles remain at sea, they are pursued only by men who take on excessive risk and have limited success; when successful, meat is distributed at public feasts, with the hunter taking nothing for himself. Hunters gained political and marital benefits lacking among men who only collected turtle from nesting beaches. Much of the difference between Meriam men and women in choices about which prey to pursue seemed linked to the variance in acquisition, both in the risks of failure and in the high potential for a bonanza harvest, with women spending more time on low-variance and men on high-variance fishing (Bliege Bird, 2007). The variance ensures the honesty of signals sent through hunting and widespread sharing, generating social capital among those who can afford to sustain high-cost, low consumption return subsistence activities. Consistent with the "actions of agency" perspective, the division of labor is here modeled as the result of conflicts of interest in the pursuit of social capital between men and women.

The extent to which gender differences in foraging are a result of gender differences in the pursuit of social capital is, however, a matter of debate, especially since many types of hunting activities pursued by men do appear to provide high caloric returns, even after accounting for sharing (but see Hawkes *et al.*, 2001; Bliege Bird *et al.*, 2002). In addition, men do appear to be sensitive to the benefits of provisioning: Hadza men provide more food to wives when they are nursing or pregnant (Marlowe, 1999, 2003), and men with dependent offspring are more likely to choose to live with good foragers than an audience for show-off behavior (Wood, 2006). Men seemed to be sensitive to the costs and benefits of provisioning low risk resources versus pursuing the social benefits of high risk resources: the foods Hadza

men were providing were mainly vegetal (honey) or smaller game, which has a lower daily risk of failure. Likewise, depending on the context, sea turtle can serve as a reliable provisioning resource targeted by married men with dependent offspring and shared in ways that preserve consumption benefits for households; or as a costly item pursued more often by unmarried men and shared widely and without regard for reciprocation (Bird, 1997). As Hawkes, O'Connell, and Coxworth (2010) point out, men's hunting can be an important source of food, but this does not mean that all of men's subsistence time allocation decisions are designed to optimize family provisioning.

To date, positive evidence for costly signaling, show-off behavior and prestige hunting has proved difficult to produce, and the extent to which subsistence risk is ameliorated through reciprocal sharing seems to vary. However, while the nuances are surely complex, the main points raised by Hawkes and others remains: risk in acquisition and how food is shared complicates both traditional notions of efficiency and the idea of a dyadic partnership between spouses that serves to provision families. These issues are still central to cutting edge research into the division of labor. Specifically, there are three areas of growing interest that focus on (i) resource acquisition risk or variance, (ii) the role of cooperative breeding and a more critical approach to the universality of the "nuclear family" and (iii) the application of microeconomic bargaining models which pay greater attention to issues of power and patriarchy.

CUTTING EDGE RESEARCH

In targeting large mobile resources, men do seem to take on consistently higher levels of risk than do women (Bliege Bird, 2007; Bliege Bird & Bird, 2008). In a recent paper, Codding, Bliege Bird, and Bird (2011) examine how acquisition risk and energy varies across sets of resources acquired by Western Desert Martu, Torres Strait Meriam, and the Neotropical hunters of Paraguay (Aché), and how this in turn affects the relative production of men and women and the extent to which gender differences in labor are convergent (overlapping) or divergent (non-overlapping). Their results suggest that men tend to target high energy resources regardless of the risk of failure, while women tend to target low risk resources, accepting lower energetic returns for lower risk of acquisition. The general division of labor then emerges as a function of the suite of available resources: when high-energy resources are only acquired with a high risk of failure, men's and women's subsistence decisions diverge, producing a more divergent division of labor. In this scenario, women tend to bring in the majority of calories (as with Martu or Hadza). When high-energy resources are acquired with low risk, men's and women's foraging choices converge, with women either directly

involved in acquisition (as with Agta or Ainu), or in a supporting role that includes residential mobility designed to facilitate men's hunting (as with Aché) or post-acquisition processing (as with Inuit). In these latter scenarios, researchers have tended to credit men's labor as more important in production; though when support and processing are considered, the real division of labor may be more equitable. Whether women are actively involved in pursuit of high return, low risk resources or more involved in supporting men's acquisition likely depends on the extent to which childcare is socially organized or provided mainly by mother. In this model, parental investment strategies determine the extent to which differences in labor choices are leveraged into a form of cooperative mutualism: benefits for cooperative breeding, for example, may create age-related labor specialization among women, while the lack of opportunities for extra-maternal care may create a diverse set of gender-related labor specializations.

Our understanding of the diversity in the sorts of individuals that cooperate in a division of labor has been stymied by the preoccupation with monogamous heterosexual couples and the normative template of the nuclear family, which evades issues raised by polygyny and polyandry, and excludes investigation into the other divisions by age and sex that structure society and the allocation of labor. That we recognize divisions of labor beyond the male–female marital pair at all is, at least in part, a product of research into the "grandmother hypothesis." Hadza grandmothers contribute tremendous amounts to raising grand-offspring, particularly in provisioning foods that children cannot acquire (Hawkes *et al.*, 1997) and such benefits for post-menopausal investment may be the adaptive function of our long, post-reproductive lifespan (Kim, Coxworth, & Hawkes, 2012). However, the scope of kin support in child rearing goes well beyond grandmother: recent reviews suggest that across populations, many different individuals assist in paying the costs of raising offspring (Mace & Sear, 2005; Sear & Mace, 2008). Mothers, perhaps not surprisingly, have a strong effect on child survival across societies; fathers, maternal and paternal grandmothers and siblings have an effect on childhood survival in some cases, but not others. Fathers have been shown to have a positive effect on successfully initiating boys into adulthood and on the timing of reproduction among Martu (Scelza, 2010), though seem to have no significant effect on the success of Tsimane children (Winking, Gurven, & Kaplan, 2011). Among Aché, unmarried men play a crucial role in provisioning kin and non-kin (Hill & Hurtado, 2009). Siblings of all ages, perhaps the most understudied kin relation, also play a large role in some societies in caring for and provisioning each other (Kramer, 2011). Within this web of alloparental relations, a more complex picture of the sexual division of labor emerges. Men and women of differing kin and social relations may alter their labor depending on the need

to care for others. This presents a more complicated picture of how men and women choose to allocate their time in many societies. However, there are still some societies that may fit the general stereotype of the nuclear family.

In social and ecological contexts where dyadic mother-father or expanded three-generational groupings are the central unit in economic decisions, differences in labor are more likely to be structured around husband-wife cooperative specialization. This is likely to be the case where high-energy resources can be acquired at low risk, where interdependencies between families in labor and the products of labor (sharing, cooperative breeding) are low, and there are strong comparative advantages for specializing, rather than sharing the work equally. Under these circumstances, understanding how men and women decide who will do what can be a central question of interest. Recent research by Gurven and Hill (2009) address this issue through the use of bargaining models. This approach treats men and women as a joint economic unit and views children as public goods with shared costs and benefits for both partners. How much effort each individual will put towards each task required to raise offspring emerges out of negotiations between partners. Lack of effort by one side or the other could result in termination of the partnership. In preliminary tests with Tsimane, Gurven and Hill (2009) find that spousal tasks are complementary and that harder working individuals pair within one another to produce more overall resources that provide for more offspring than less productive couples. However, they find mixed results that individuals with greater bargaining power (as a function of overall individual value) perform less work within the household, suggesting that negotiations of effort may be worked out prior to the formation of spousal pairs. While this will vary greatly across societies, they predict that the specific amount an individual husband or wife should contribute to the household depends on their relative bargaining power, which should determine power dynamics and work effort between individuals. This microeconomic approach serves to formalize analyses of within-household effort. When such partnerships are common, this framework may have some promise in explaining variability in work effort between cooperating individuals.

KEY ISSUES FOR FUTURE RESEARCH

Providing a complete explanation for variability in the sexual division of labor will require broad approaches that link current cutting edge theories and models with expansive datasets that incorporate fine-grained data on multiple populations in varying environments. While this task is a massive undertaking, there are some more basic questions that can help guide immediate progress.

Are Gender Differences the Result of Risk Sensitivity, and if so, Why a Gender Difference?

Recent research has provided more evidence on how men's and women's resource choice varies, but we are still at a loss to understand how men and women evaluate the costs of risk differently. Why might men be more willing than women to take on greater levels of acquisition risk? To better understand this, researchers should begin by testing alternative hypotheses that evaluate predictions from standard diet breadth models, nutrient complementarity models, models of acquisition risk and models of prestige. Understanding how men and women differentially evaluate costs and benefits within the same currencies will allows us to better understand when women take on greater acquisition risk, or when men might spend greater effort to provision offspring. The answer may also depend on how individuals benefit from sharing food widely.

What are the Benefits of Sharing Food Widely?

Despite many years of research, there is still little understanding of how exactly individuals might benefit from sharing food, particularly whether sharing is structured by the need to pool risk to provision self and offspring, or whether it's more about creating social relationships and gaining social prestige. Evidence of two-way flows is not enough to determine whether or not giving is contingent upon receiving (a requirement of risk pooling) and there has been no quantitative data collected on actual consumption that measures, from the perspective of the consumer, whether a reliance on receiving portions of others' high variance foods produces the same consumption patterns as acquiring a lower-return, but low variance resource for one's self. Answering this question requires long-term ethnographic information that links quantitative data on resource acquisition and hunting success to complete food sharing networks, perceived measures of status and prestige and proxy measures of somatic and reproductive success. As daunting as this task may be, it is necessary if we are to answer this question.

Who Cares for Kids Where and When?

To understand patterns in the sexual division of labor will require understanding how broader social and ecological variability predicts variability in the networks of alloparental support across and within populations. Answering this question will provide a more refined picture of the sexual division of labor that avoids assuming dyadic partnerships as an unquestioned initial condition.

How Does Acquisition Variance Affect Offspring Health and Survivorship?

While men do seem to take on greater levels of acquisition risk in many societies, we do not know what effects this may have on child health and survivorship. Riskier acquisition portfolios may result in malnutrition, reductions in offspring growth or increases in disease susceptibility; but to date, we know very little about this topic. Addressing these problems will provide a better understanding of how risk and variance in resource acquisition may cost parents by reducing offspring quality and survivorship.

How Does Variability in the Sexual Division of Labor Affect Broader Societal Patterns?

The effects of the division of labor may reach well beyond variability in task differentiation. For example, the relative contribution women make to subsistence seems to predict matrilocal residence patterns (once controlling for non-sororal polygyny, Korotayev, 2001). Similarly, greater production by women may lead to differences in men's and women's status differentials, systems of land tenure and patterns in wealth inheritance. Variability in the division of labor may lead to shifts in fertility and survivorship which aggregate into broader demographic outcomes, all of which likely feeds back to affect the labor decisions that women and men make. Answering these questions in ways that adequately determine causality is near impossible, but any steps taken in this direction will serve to broaden our understanding of the sexual division of labor and its interactive effect on broader societal patterns.

Research undertaken in last quarter of the twentieth century truly broadened our understanding of the division of labor. Given the successful strides made in the first decade of the twenty-first, we should be optimistic about the future. Future models of the sex and gender division of labor will need to draw together factors that affect men's and women's foraging decisions across different explanatory traditions: sometimes cooperative economies of scale may emerge in particular contexts, other times conflicts between individual decisions will result in divergent divisions of labor and larger networks of alloparental support in childcare. Power and patriarchy may play an important role in structuring gendered labor where women do not have access to strong social networks of kin and nonkin, and rely almost exclusively on male production. Rather than fossilizing a static view of the division of labor, evolutionary anthropology will have to work towards explaining the variability observed among ethnographic groups. Doing so will provide a more realistic framework to explore spatial and temporal variability in the division of labor.

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REFERENCES

Alexander, R. D., & Noonan, K. M. (1979). Concealment of ovulation, parental care, and human social evolution. In N. A. Chagnon & W. Irons (Eds.), *Evolutionary biology and human social behavior: An anthropological perspective* (pp. 402–435). North Scituate, MA: Duxbury Press.

Becker, G. S. (1985). Human capital, effort, and the sexual division of labor. *Journal of Labor Economics*, *3*, 33.

Biesele, M., & Barclay, S. (2001). Ju/'hoan women's tracking knowledge and its contribution to their husbands' hunting success. *African Study Monographs. Supplementary Issue.*, *26*, 67–84.

Bird, D. W. (1997). Delayed reciprocity and tolerated theft: The behavioral ecology of food-sharing strategies. *Current Anthropology*, *38*, 49–78.

Bliege Bird, R. (2007). Fishing and the sexual division of labor among the Meriam. *American Anthropologist*, *109*, 442–451.

Bliege Bird, R., & Bird, D. W. (2008). Why women hunt. *Current Anthropology*, *49*, 655–693.

Bliege Bird, R., Bird, D. W., Smith, E. A., & Kushnick, G. C. (2002). Risk and reciprocity in Meriam food sharing. *Evolution and Human Behavior*, *23*, 297–321.

Bliege Bird, R., & Smith, E. A. (2005). Signaling theory, strategic interaction, and symbolic capital. *Current Anthropology*, *46*, 221–248.

Bliege Bird, R., Smith, E., & Bird, D. W. (2001). The hunting handicap: Costly signaling in human foraging strategies. *Behavioral Ecology and Sociobiology*, *50*, 9–19.

Brown, J. K. (1970). A note on the division of labor by sex. *American Anthropologist*, *72*, 1073–1078.

Burton, M. L., Brudner, L. A., & White, D. R. (1977). A model of the sexual division of labor. *American Ethnologist*, *4*, 227–252.

Codding, B., Bliege Bird, R., & Bird, D. W. (2011). Provisioning offspring and others: Risk–energy trade-offs and gender differences in hunter–gatherer foraging strategies. *Proceedings of the Royal Society of London. Series B*, *278*, 2502–2509.

Dahlberg, F. (1983). *Woman the gatherer*. New Haven, CT: Yale University Press.

Elston, R. G., & Zeanah, D. W. (2002). Thinking outside the box: A new perspective on diet breadth and sexual division of labor in the Prearchaic Great Basin. *World Archaeology*, *34*, 103–130.

Goodman, M. J., Griffin, P. B., Estioko-Griffin, A. A., & Grove, J. S. (1985). The compatibility of hunting and mothering among the Agta hunter-gatherers of the Philippines. *Sex Roles*, *12*, 1199–1209.

Gurven, M., & Hill, K. (2009). Why do men hunt? A reevaluation of "man the hunter" and the sexual division of labor. *Current Anthropology*, *50*, 51.

Hawkes, K. (1990). Why do men hunt? Some benefits for risky strategies. In E. A. Cashdan (Ed.), *Risk and uncertainty in tribal and peasant economies*. Boulder, CO: Westview Press.

Hawkes, K. (1991). Showing off: Tests of an hypothesis about men's foraging goals. *Ethology and Sociobiology*, *12*, 29–54.

Hawkes, K., O'Connell, J. F., & Blurton Jones, N. G. (1997). Hadza women's time allocation, offspring provisioning, and the evolution of long postmenopausal life spans. *Current Anthropology*, *38*, 551–577.

Hawkes, K., O'Connell, J. F., & Blurton Jones, N. G. (2001). Hadza meat sharing. *Evolution and Human Behavior*, *22*, 113–142.

Hawkes, K., O'Connell, J. F., & Coxworth, J. E. (2010). Family provisioning is not the only reason men hunt. *Current Anthropology*, *51*, 259–264.

Hawkes, K., O'connell, J. F., Jones, N. G., Oftedal, O. T., & Blumenschine, R. J. (1991). Hunting income patterns among the Hadza: Big game, common goods, foraging goals and the evolution of the human diet [and discussion]. *Philosophical Transactions: Biological Sciences*, *334*, 243–251.

Hewlett, B. S. (1987). Intimate fathers: Patterns of paternal holding among Aka Pygmies. In M. E. Lamb (Ed.), *The father's role: Cross-cultural perspectives* (pp. 295–330). Hillsdale, NJ: Lawrence Erlbaum Associates.

Hill, K. (1988). Macronutrient modifications of optimal foraging theory: An approach using indifference curves applied to some modern foragers. *Human Ecology*, *16*, 157–197.

Hill, K., & Hurtado, A. M. (2009). Cooperative breeding in South American hunter–gatherers. *Proceedings of the Royal Society B: Biological Sciences*, *276*, 3863–3870.

Hrdy, S. B. (1999). *The woman that never evolved*. Cambridge, MA: Harvard University Press.

Hurtado, A., Hawkes, K., Hill, K., & Kaplan, H. (1985). Female subsistence strategies among Ache hunter-gatherers of Eastern Paraguay. *Human Ecology*, *13*, 1–28.

Hurtado, A. M., Hill, K., Hurtado, I., & Kaplan, H. (1992). Trade-offs between female food acquisition and child care among Hiwi and Ache foragers. *Human Nature*, *3*, 185–216.

Ivey, P. K. (2000). Cooperative reproduction in Ituri Forest hunter-gatherers: Who cares for Efe infants? *Current Anthropology*, *41*, 856–866.

Jarvenpa, R., & Brumbach, H. J. (2006). Revisiting the sexual division of labor: Thoughts on ethnoarchaeology and gender. *Archeological Papers of the American Anthropological Association*, *16*, 97–107.

Kaplan, H., Hill, K., Lancaster, J., & Hurtado, A. M. (2000). A theory of human life history evolution: Diet, intelligence, and longevity. *Evolutionary Anthropology Issues News and Reviews*, *9*, 156–185.

Kim, P. S., Coxworth, J. E., & Hawkes, K. (2012). Increased longevity evolves from grandmothering. *Proceedings of the Royal Society B: Biological Sciences*, *279*, 4880–4884.

Korotayev, A. (2001). An apologia of George Peter Murdock. Division of labor by gender and postmarital residence in cross-cultural perspective: A reconsideration. *World Cultures*, *12*(2), 179–203.

Kramer, K. L. (2011). The evolution of human parental care and recruitment of juvenile help. *Trends in Ecology & Evolution*, *26*, 533–540.

Leacock, E. (1981). History, development, and the division of labor by sex: Implications for organization. *Signs*, *7*, 474–491.

Lee, R. B. (1979). *The! Kung San: Men, women, and work in a foraging community*. Cambridge, England: Cambridge University Press.

Lovejoy, C. O. (1981). The origin of man. *Science*, *211*, 341–350.

Mace, R., & Sear, R. (2005). Are humans cooperative breeders. In E. Voland, A. Chasiotis & W. Schiefenhoevel (Eds.), *Grandmotherhood: The evolutionary significance of the second half of female life* (pp. 143–159). Piscataway, NJ: Rutgers University Press.

Marlowe, F. W. (1999). Showoffs or providers? The parenting effort of Hadza Men. *Evolution and Human Behavior*, *20*, 391–404.

Marlowe, F. W. (2003). A critical period for provisioning by Hadza men: Implications for pair bonding. *Evolution and Human Behavior*, *24*, 217–229.

Murdock, G. P., & Provost, C. (1973). Factors in the division of labor by sex: A cross-cultural analysis. *Ethnology*, *12*, 203–225.

Noss, A. J., & Hewlett, B. S. (2001). The contexts of female hunting in Central Africa. *American Anthropologist*, *103*, 1024–1040.

Scelza, B. A. (2009). The grandmaternal niche: Critical caretaking among Martu Aborigines. *American Journal of Human Biology*, *21*, 448–454.

Scelza, B. A. (2010). Fathers' presence speeds the social and reproductive careers of sons. *Current Anthropology*, *51*, 295–303.

Sear, R., & Mace, R. (2008). Who keeps children alive? A review of the effects of kin on child survival. *Evolution and Human Behavior*, *29*, 1–18.

Steward, J. H. (1938). *Basin-plateau aboriginal sociopolitical groups*. Washington, DC: US Government Printing Office.

Washburn, S., & Lancaster, C. S. (1968). The evolution of hunting. In R. B. Lee & I. Devore (Eds.), *Man the hunter* (pp. 293–303). Chicago, IL: Aldine.

Watanabe, H. (1968). Subsistence and ecology of northern food gatherers with special reference to the Ainu. In R. B. Lee & I. Devore (Eds.), *Man the hunter* (pp. 69–77). Chicago, IL: Aldine.

Winking, J., Gurven, M., & Kaplan, H. (2011). Father death and adult success among the Tsimane: Implications for marriage and divorce. *Evolution and Human Behavior*, *32*, 79–89.

Wood, B. M. (2006). Prestige or provisioning? A test of foraging goals among the Hadza. *Current Anthropology*, *47*, 383–387.

Zeanah, D. W. (2004). Sexual division of labor and central place foraging: A model for the Carson Desert of western Nevada. *Journal of Anthropological Archaeology*, *23*, 1–32.

FURTHER READING

Coltrane, S., & Shih, K. Y. (2010). Gender and the division of labor. In J. C. Chrisler & D. R. McCreary (Eds.), *Handbook of gender research in psychology* (pp. 401–422). New York, NY: Springer.

Cooke, L. P. (2004). The gendered division of labor and family outcomes in Germany. *Journal of Marriage and Family*, *66*, 1246–1259.

Ember, C. R., & Ember, M. (2003). *Encyclopedia of sex and gender: Men and women in the world's cultures*. New York, NY: Kluwer Academic/Plenum Publishers.

Hrdy, S. B. (2009). *Mothers and others: The evolutionary origins of mutual understanding*. Cambridge, MA: Harvard University Press.

Leacock, E. (1981). History, development, and the division of labor by sex: Implications for organization. *Signs*, *7*, 474–491.

Marlowe, F. W. (2007). Hunting and gathering: The human sexual division of foraging labor. *Cross-Cultural Research*, *41*, 170–195.

Peacock, N. R. (1991). Rethinking the sexual division of labor. In M. D. Leonardo (Ed.), *Gender at the crossroads of knowledge: Feminist anthropology in the postmodern era*. Berkeley: University of California Press.

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