Intergenerational Wealth Transmission and Inequality in Premodern Societies

Reply

CA+ Online-Only Supplement: Estimating the Inheritance of Wealth in Premodern Societies

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The papers in this special section provide empirical support for a model of the role of intergenerational wealth transmission in explaining variation in wealth inequality across premodern societies. Our results lead us to conclude that variation in intergenerational transmission rates explain a substantial portion of such inequality, as expected from our model, but do so *in conjunction with other factors*, particularly the types of wealth involved, the nature of the production system, and the social institutions associated with those systems. The commentators variously applaud our efforts, query the importance of intergenerational transmission relative to other factors, and raise questions about our analytical methods and the representativeness of our sample of societies. Here we address the most important challenges raised in the comments and highlight much-needed future lines of research.

We sought to understand some of the determinants of wealth inequality by means of a dynamic model (presented more fully in Borgerhoff Mulder et al. 2009) in which the long-run equilibrium level of inequality depends on just two things. The first is the extent of new inequalities that occur in each generation (windfall gains and losses that in our model are uncorrelated with wealth), measured by σ_λ^2, the variance of the shocks. The second is the extent to which these shocks are passed on from generation to generation, as measured by the inverse of $1 - \beta^2$, which becomes a very large number as β approaches 1. From this model we deduce that long-run inequality is simply the ratio of these two quantities, or $\sigma_\lambda^2/(1 - \beta^2)$. The model is a deliberate simplification designed to capture two important influences on wealth inequality in the very long run in a way that is comparable across many different kinds of economic systems and processes of production. Simplicity and comparability are its virtues: it makes no pretense of capturing all of the influences on this process.

The Role of Shocks

This brings us to an interesting suggestion by Gregory Clark, but first we need to correct a possible misunderstanding. Clark writes that we seek to "measure and explain the degree of social inequality in societies simply by measuring" β (p. 101). In fact, we measure inequality using the Gini coefficient, a statistic that bears no necessary relationship to β; one can imagine a highly unequal society in which positions in the wealth distribution are randomly drawn each generation ($\beta = 0$) or an extremely egalitarian society in which parental wealth is a near-perfect predictor of child wealth. In our data set, for example, inequalities in body weight are very modest, but weight is strongly transmitted across generations. Clark is correct, however, that in explaining the Gini, we do not consider the possibility that the extent of shocks (σ_λ^2) may vary across economic systems. We were unable to explore this possibility in our study as there are no currently feasible measures of the extent of shocks.

But, like Clark, we cannot resist speculating about the nature and extent of these shocks. In addition to the reasons Clark offers for believing that the wealth of farmers and herders may be subject to greater shocks than the wealth of foragers, we would add portfolio diversification: foragers subsist on literally hundreds of species of plants and animals, while agricultural and pastoral subsistence often depends on relatively few. We may test whether σ_λ^2 differs between hunter-gatherer and horticultural economies, on the one hand, and agricultural and pastoral economies, on the other, by taking the logarithm of $\sigma_\lambda^2/(1 - \beta^2)$ to turn this ratio into a sum, which may then be estimated using ordinary least squares regression, as follows:

$$\text{Gini} = a + bH + c\ln[1/(1 - \beta^2)] + \varepsilon, \quad (1)$$

where H is a dummy variable taking the value of 1 for wealth measures from hunter-gatherer or horticultural economies. The estimate of a is a measure of the extent of shocks in the agricultural and pastoral economies and $a + b$ is the corresponding measure for hunter-gatherer and horticultural economies. The parameter c estimates the effect of variations in the extent of intergenerational wealth transmission on the

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degree of inequality. Here is the estimated equation with *t*-statistics in parentheses (all highly significant):

$$\text{Gini} = 0.39 - 0.14H + 0.14\ln[1/(1-\beta^2)]$$
$$(9.09) \quad (-2.73) \quad (2.22) \qquad (2)$$

($R^2 = 0.32$, $n = 43$). The estimates imply that shocks in agricultural and pastoral societies are 56% larger (0.39/0.25–1) than in hunter-gatherer and horticultural populations, consistent with Clark's conjecture.

Transmission Rates versus Mechanisms

Turning from the explanation of the level of inequality to the estimation of the degree of inheritance, we distinguish between the extent of transmission (β, a statistical relationship) and the process of inheritance. The latter, as James Boone points out, is highly heterogeneous, including such disparate processes as material bequests, socialization by parents, and genetic transmission. Boone considers this heterogeneity a problem, while Stephen Shennan considers our statistical concept a clever and "creative abstraction." Richard Waller elaborates on the specifics of how material, relational, and knowledge-based embodied wealth are transmitted, and we find it encouraging that our study, which undoubtedly pushes the quantification of ethnographic data to its limits, corresponds so closely to a historian's interpretation of the ethnographic materials.

To clarify the difference between our measure of overall transmission and the causal processes of inheritance contributing to it, suppose that in a herding economy the wealth of the father (W') is correlated with the wealth of the son (W) both by direct bequest and by virtue of the fact that the father's wealth allows him to provide better nutrition and, hence, more somatic capital (S), to his son (fig. 1).

Thus we have

$$S = a + bW', \qquad (3)$$

$$W = A + BW' + CS, \qquad (4)$$

where a and A are constants, b is the effect of variations in W' on S, and B and C, respectively, are the effects of variations in W' and S, respectively, on W. Substituting the expression for S into equation (4), we have

$$W = A + BW' + C(a + bW') = A + Ca + (B + Cb)W'. \qquad (5)$$

The expression $(B + Cb)$ gives the total effect of parental wealth on offspring wealth, of which B is the direct and Cb the indirect effect.

If by "inheritance" Boone means the literal passing on of things (by bequest, e.g.), then he is surely correct to say that "inheritance is . . . unfeasible unless wealth can be . . . sequestered" (p. 98). But in the above example, a mechanism

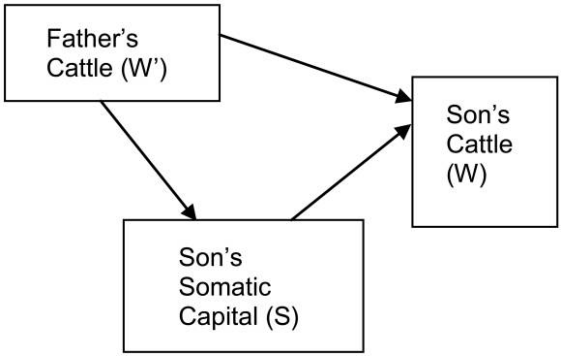

Figure 1. Example of direct and indirect transmission.

other than actual bequest is involved, namely, nutrition, which creates somatic capital (embodied wealth). The indirect effect need not be positive, of course, as is the case (e.g., in our data on the Kipsigis) when greater parental wealth is associated with a larger number of offspring. To see this, just redefine S, above, as number of sons, and note that in this case, C would be negative because the more sons a father with a given amount of wealth has, the less will be the wealth transferred to the son.

Interdependence of Different Wealth Types

We adopt a broad definition of wealth, adding embodied and relational forms to the more conventional focus on material capital. Several commentators point out that different wealth classes are not independent of each other. Thus, Kenneth Ames reminds us of Walker and Hewlett's (1990) hypothesis that those with large kin networks have better dental health, probably as a result of access to a greater range of foods (an interaction of relational and embodied wealth), Dan Bradburd describes how Komachi (and many others) use wealth to build social connections, and vice versa, and Mark Flinn observes how hard it may be to tease apart power and resources.

We agree that our classes of wealth are interdependent, but that does not mean they cannot be measured and the effects of their variation studied. There are two very different kinds of interdependence to be considered. First, the contribution of one kind of wealth to an individual's well-being may depend on the level of some other kind of wealth; and second, how much wealth of one type an individual has may be the result of having other kinds of wealth.

With respect to the first, our model does *not* assume independence of wealth types but, rather, a relationship of complementarity, such that the marginal effect of a larger herd, for example, increases with the number of political supporters. Thus, the effect on well-being of any one kind of wealth a family has depends on their holdings in other kinds of wealth. This complementarity may help determine the degree of transmission, but we see this as a strength of our approach rather than a flaw.

To explicate this more fully, consider our definition of a

household's wealth: any attribute that contributes to its well-being as measured by consumption levels, social status, or other ends that are valued in the particular society. To take account of many kinds of wealth simultaneously, we define the importance of each class of wealth as follows. Let E, M, and R be positive numbers representing the amount of a household's embodied, material, and relational wealth. The well-being of the household, W, is a weighted product of these classes of wealth, the weights being the relative importance of each wealth class in the production system in which the household lives:

$$W = \gamma E^e M^m R^r, \tag{6}$$

where γ is a positive constant and the exponents e, m, and r (the weights) are the derivatives of the logarithm of well-being with respect to the logarithms of the three respective wealth classes or, equivalently, the percent difference in well-being associated with a percent difference in the amount of each class of wealth.

The weighted product is preferred (to the weighted sum, e.g.) because it implies, plausibly, that the wealth classes are complements; that is, the contribution of each class of wealth to individual well-being is enhanced by the extent of the other classes of wealth. This is the first sense in which wealth classes are interdependent. We do not know, of course, if we have correctly captured the nature and extent of the interdependencies as we have not yet estimated an equation like (6) explicitly. This is among our current research projects.

The second kind of interdependence concerns the process by which an individual acquires wealth; for example, a well-connected person may find it easier to acquire a large herd. Thus, in the above example the material wealth of the father contributes to the embodied wealth of the son, which in turn contributes to the material wealth of the son. This is true in many cases, and it may help explain the degree of transmission. But it is not a criticism of our methods as long as our estimate of β is an unbiased estimate of the effect of a parental wealth shock on the wealth of the offspring. If figure 1 correctly captures the causal relationships involved, then an unbiased estimate of β is achieved by regressing son's wealth against father's wealth, as we do. In this case, were we to include a separate control for the son's somatic capital (S), this would introduce a negative bias into our estimate of β, one that netted out the indirect consequences of the father's wealth.

But suppose that S represented the son's herding skills acquired from the dad and consider the effect of the loss of the father's herd through theft. This shock would eliminate the direct bequest of cattle but need not prevent the indirect transfer of skills, so instead of a fraction ($B + Cb$) of the shock being passed on to the son, only B would be passed on, so our estimate would be upward biased by an amount Cb/B. This type of bias will arise for any attribute that is correlated between generations and is conducive to achieving higher wealth but is not a direct *consequence* of parental wealth. Because we cannot fully specify all the factors and causal relationships that are at work in these many societies, we cannot rule out the possibility that some of our estimates of β may be biased.

In any case, the commentators' concerns about the lack of independence among wealth types point to plenty of new territory to explore with respect to examining the implications of these interactions. In situations where success in acquiring one kind of wealth, such as a large group of friends, strongly favors acquisition of material goods or robust health, the extent of inequality may be much greater than in a situation where each family or individual has a chance to prosper in their pursuit of any wealth type, irrespective of their success or failure in acquiring other wealth types. We also think that the uncoupling of material and relational wealth might provide insights into the intriguing question raised by Robert Kelly as to why the social-leveling mechanisms observed in many hunter-gatherer and simple horticultural populations stop working so effectively in pastoralists and farmers. Perhaps there is a tipping point where welfare losses resulting from the diminished popularity of a hoarder are eclipsed by the benefits of material accumulation, a point more easily reached when material and relational wealth are relatively independent. These are questions we will be examining empirically in some of our more complete data sets.

Are Wealth Transmission and Inequality Correlated?

Both Clark and Frederic Pryor are concerned that a central implication of our model—that there should be a positive relationship between the degree of intergenerational transmission (as measured by β) and the level of inequality (as measured by the Gini coefficient)—is not borne out in our data. (We do not share Pryor's concern that many of our estimates are not significantly different from 0 since there is no reason to discount a reasonably precisely estimated value of β merely because it is close to 0: some forms of wealth are simply not transmitted across generations.) Clark states that the (β, Gini) correlation we document (which is 0.41 when calculated over the 43 population-specific and wealth type–specific estimates) is very weak. This objection falls into the glass half-empty category; it is not clear how high this figure would have to be to validate our expectation since the correlation depends on the variability across the 43 observations in the realized variance of the idiosyncratic shock term (σ^2_λ). Given this, we would expect the (β, Gini) correlation to rise when the 43 observations are aggregated into their 12 cell means (as in tables A4 and A5 in the CA+ online supplement "Estimating the Inheritance of Wealth in Premodern Societies" in the online edition of *Current Anthropology*) since this averaging should remove some of the noise contained in σ^2_λ. This is, in fact, what we observe: the correlation rises to 0.51 when calculated over the 12 wealth class– and economic

system–specific averages. At a still higher level of aggregation, the correlation between the α-weighted β's for each production system and their α-weighted Gini coefficients is 0.90, a result that achieves statistical significance at the 10% level despite resting on only four observations. The fact that there is a statistically significant and nontrivial relationship between intergenerational transmission and inequality, observed at all three levels of aggregation, is strong validation of the central prediction of our model.

But Pryor notes that there should also exist a positive relationship between the β's and the Gini coefficients *within* each production system as well as in the aggregate, and this generalization is valid (though it might be difficult to test given that we have an average of only 11 observations per production system). As Pryor shows, this is the case for pastoral and agricultural but not for hunter-gatherer and horticultural systems, where the relationship is actually negative. But this surprising result is driven entirely by the five observations on body weight, which were available only for a few hunter-gatherer and horticultural populations. When a dummy variable is included that flags these few cases, the coefficient on β as a predictor of the Gini is almost exactly 0 and has a large standard error in these two production systems.

The reason body weight is an outlier is that, while it is strongly transmitted across generations, it simply cannot be very unequally distributed. Unlike material wealth or social ties, body weight is physically constrained to lie in a fairly narrow range. One can have 10 times as many cows as the next herder but not weigh 10 times as much! More important for our model, an adverse shock can eliminate 90% of one's herd, while an individual experiencing an adverse health shock with a similar weight loss would not survive and, hence, would not be in our sample. In terms of our model, this physical constraint on overall variability translates into a lower value of σ_λ^2 for this form of wealth and, hence, a lower Gini for any given value of β. Its Gini coefficients are thus some 20 points lower than those for non-body-weight forms of wealth, reflecting both the physiological limits on body size and the sharing of food among families in the societies in question mentioned by both Pryor and Clark. Nonetheless, the lack of a positive relationship among hunter-gatherers and horticulturalists between Gini and β, even taking account of this peculiarity of the wealth measure, is puzzling and deserves further attention.

Pryor offers three possible explanations. The first two of these strike us not so much as alternatives to but restatements of our model. He argues that an ergodic stochastic model of the intergenerational transmission process would "show that the distribution of wealth asymptotically approaches an equilibrium that depends on the various societal rules specified in the model" (p. 112). This is the basis of our reasoning as well, with β being the parameter that captures the effects of all the "various societal rules" at work, including those "nondemographic societal rules" that Pryor emphasizes in his second numbered paragraph and which he notes are discussed in several of the production system–specific papers. Pryor thinks that "the inheritance rule, not the calculated β, is the key variable to examine" (p. 112). But inheritance rules are difficult to directly quantify in ways that are comparable across wealth types and production systems and are only relevant to some sorts of wealth. Our β's are not an alternative to examining these rules but, rather, a way of examining the effects of these rules along with other influences on intergenerational transmission in a manner that allows quantitative comparisons.

Pryor's third point is that foraging and horticultural societies engage in more redistribution, which should reduce wealth inequality properly measured. This, along with Clark's related observation on the differences in the magnitude of shocks across production systems, recommends a more explicit modeling of the effect of societal institutions and norms and how these interact with the nature of wealth in sustaining inequality in the long run. We are currently engaged in this project.

More direct evidence that influences other than the extent of intergenerational transmission are at work comes from our summary table (table A5 in the CA+ online supplement). Averaging the α-weighted β's for the hunter-gatherer and horticultural populations, on the one hand, and the farming and herding populations, on the other, the values of $1/(1-\beta^2)$ are 1.04 and 1.18, respectively, implying 14% greater wealth inequality in the latter than the former, assuming that σ_λ^2 does not differ across populations and that the model is correct. But wealth inequality (measured by the α-weighted Gini coefficients) is 77% greater in the latter.

Clark's comment that the model does not illuminate the persistence of class or racial or other group inequality is well taken, though his suggested solution appears a bit mechanical; he simply assumes that "upper-class parents have upper-class children" (p. 102).

What to Measure and How

Our method for the derivation of α (our measure of the relative importance of each wealth type) concerned some commentators. We based α values for each population in the project on the judgment of the participating ethnographer or historian and calculated average values of α for various sets of societies based on these. We view quantification of ethnographic information as a critical first step in testing our model. In addition, we remind readers that as a comparative check, we calculated values of α for material wealth using published quantitative data on one horticultural, two pastoral, and seven small-scale agricultural populations not in our sample, and these were extremely close to our own ethnographic estimates for comparable populations in our project sample (summary in the concluding paper in this special section [Smith et al. 2010*a*] and further details in the section "Sta-

tistical Estimation of m: α Value for Material Wealth" in the CA+ online supplement). Moreover, even with the unrealistic assumption that α values are equal across wealth types, we found that β differed by wealth type and production system.

Shennan wonders why we do not discuss the evolutionary implications of reproductive success (RS) and rightly points out that number of children is a poor measure of RS from an evolutionary perspective. As discussed in our introductory paper (Bowles, Smith, and Borgerhoff Mulder 2010, in this issue), we use RS not as a fitness measure but, rather, as an "indicator of somatic wealth, capturing an individual's ability to produce and successfully raise offspring" (p. 9). From this perspective, there are many justifications for using number of children as an outcome measure. First, children can be viewed as direct indices of parental somatic wealth. Pregnancy and lactation are highly calorically demanding, and children require a significant investment in time and effort spent in caretaking. Number of surviving children thus indexes a parent's physical condition, knowledge, and working capacity, including parental ability to handle trade-offs between reproduction and subsistence work or other obligations. Children can also serve as indicators of parental wealth whenever they contribute to household wealth production (e.g., Kramer 2005; Kramer and Boone 2002). In most traditional societies, children, especially daughters, also yield important help with the care of younger siblings (Kramer 2005; Mace and Sear 2005). Children may also serve as a key means of generating relational wealth since durable alliances can be created through marriage, fostering, or adoption. In sum, we fully acknowledge that reproductive success can be viewed as both a form of wealth and an outcome of it. In treating RS as a form of wealth, we highlight one perspective, while in future work we intend to highlight the other by directly examining the relationship between wealth and fitness.

Bradburd suggests that relational wealth may be poorly measured by number of ties. We agree with this assessment. Although we have used number of ties as a measure of network in several cases, in others we had the data—and sometimes went to great lengths—to weight each tie by a measure of quality. For example, each tie in the Bengaluru network data was weighted using the ratio of each network member's income relative to that of the network node. This reduced the β estimate to 0.114 (SE = .073; $P = .117$) compared to the estimate of 0.218 (SE = .060; $P = .000$) derived from unweighted data but produced an estimate that better captures the value of one's network ties.

Production Systems and Population Sample Bias

Our ability to make inferences about wealth inequality and inheritance typical of a given type of production system was inevitably limited by the sample of populations for which sufficient quantitative multigenerational wealth data existed. Kelly and others question how useful the production system categories (forager, pastoralist, horticulturalist, farmer) are at tracking causality. We acknowledge that our reliance on the traditional typology of production systems is imperfect because causal factors do not map neatly onto such a typology, but we defend it as a useful starting point. Bradburd suggests that we could perhaps learn more about the role of intergenerational transmission in contributing to inequality by conducting a conventional cross-cultural study of the ways in which wealth is generated, transferred, maintained, and dispersed. Presumably, he is thinking of using a comparative database like the Human Relations Area Files or the Outline of Cultural Materials (http://www.yale.edu/hraf/; Murdock et al. 2006). Such a study would be a useful complement to ours but runs into the usual kinds of problems—relatively limited information (and/or codes) on inheritance, the near-absence of data on the transmission of relational and embodied wealth, and reliance on normative statements rather than behavioral observations.

With regard to possible bias in the set of populations included in production system category and the sets of measures used, we were obviously limited by cases for which the kinds of data required to apply our model were available. Bradburd is concerned that inferences about horticulturalists are biased given our sample of four relatively egalitarian horticulturalist populations. However, larger samples indicate that the great majority of horticultural societies are egalitarian (see Gurven et al. 2010, in this issue, table 1). In addition, our sample is informative in demonstrating that domestication alone does not lead to increases in wealth inequality. The critique is nevertheless quite valid and can even be generalized: any typology used to categorize populations will be a generalization with many exceptions illustrating a wide range of variation. Similarly, we could not obtain intergenerational wealth data on complex hunter-gatherers, who exhibit extensive property rights and nonegalitarian social relations, as noted by Ames; nevertheless, our sample includes Lamalerans and Meriam (populations with corporate kin groups holding property rights of various kinds), enhancing the range of variation in the forager sample.

We addressed the problem of production system sample bias in two ways. First, we reclassified societies (Ache as horticulturalists and Kipsigis as pastoralists) and reran our analyses by production category, and we found no significant change in average β from our previous analysis (table A7 in the CA+ online supplement). Second, each of the papers in this issue discusses results and evaluates conclusions in light of the sample bias of analyzed cases. Thus, Gurven et al. (2010) discuss island horticulturalist populations and other more hierarchical societies for which requisite data were not available, and Smith et al. (2010*b*, in this issue) do the same for hunter-gatherers. Even though the horticulture chapter only includes quantitative analysis of four societies, our initial working hypothesis would be that more transegalitarian horticultural populations will show higher β for the limited resources (e.g., land) that likely would also exhibit higher α. Finding such a horticultural population that looks more like

an agricultural population in terms of β and/or α would help focus attention on the social institutions or ecological factors that produce such a result.

Still, the concerns raised in this regard by Bradburd, Kelly, and others are valid. We have plenty of ideas about the causes of inequality, and in our ongoing research, with a larger sample and more data, we will use more specific explanatory variables, paralleling the work of Henrich et al. (2004) in their study of cross-cultural variability in notions of fairness. By analyzing the effect of various possible independent variables, we should be able to move beyond the typological approach of production system variation. In addition, study of the variation in wealth inheritance among societies with similar production systems may further illuminate the roles of norms and institutions and other factors.

Multiple Determinants

Ambitious papers that seek generalizations from comparative data inevitably favor some hypotheses or explanatory factors and ignore others. How do we justify what is *not* included as an explanation for inequality? Håkansson (1998, 2004) begs for more attention to regional economic exchange networks. World system theorists attribute much of economic inequality to exchange, trade, and competition occasioned by such dynamics beyond the borders of the population of interest, and rightly so—regional dynamics can indeed spur intensification, wealth accumulation, and political centralization, but they do so *through their effects on the wealth types we study*. Thus, as Håkansson found, the nineteenth-century East African ivory and cloth caravans extended preexisting trade networks and increased the value of marketable goods, providing a stimulus for agricultural intensification, accumulation of livestock, political centralization, and, one might assume, increased inequality. This happened through increasing the value of livestock—in our terms, raising the α value of material wealth in pastoralist systems. Thus, we do not see world systems theory as providing an *alternative* to our own explanation for the emergence of inequality.

Flinn draws attention to another potentially omitted dimension, the role of differential power in generating inequality. This is a question with which many, from Max Weber onward, have grappled. Is power just another form of wealth, is it derived directly from relational wealth (e.g., an individual's centrality in a network), or is it an entirely independent (and overlooked) dimension, possibly equivalent to status? These are wonderful questions but not ones that our research was designed to address, and until comparable empirical measures of status from multiple populations are available, we cannot determine the intergenerational transmission of status.

Bradburd objects to our statement (in the essay on hunter-gatherers by Smith et al. [2010*b*] in this special section) that "it is much harder to construct institutions to transmit social ties and knowledge than to do so for material wealth" (p. 31). His objection appears to be that ownership, wealth transmission, and so on require social institutions; we of course agree, and the quoted statement in no way implies otherwise. It simply claims that it is relatively difficult to construct institutions to delineate ownership of (and control over) certain kinds of wealth. More important, examples of the ways in which our analyses help reveal the importance of social institutions in shaping wealth transmission and inequality are discussed throughout the set of papers in this special section.

Consequences of Agricultural Intensification

Thomas Håkansson argues that we overstate the relationship between intensive agriculture and political complexity, as well as the relationship between complexity and the scarcity of arable land due to population pressure. This point is somewhat peripheral to our argument, which addresses economic inequality, not political complexity, and we believe that the relationship between complexity, power hierarchies, centralization, and inequality lies beyond the purview of this paper. We certainly agree with Håkansson that "intensive cultivation is often present in the archaeological record before the emergence of political centralization" (p. 105). Our sample of agricultural societies bears this out: three of the eight intensive agricultural societies in our sample—the Khasi, the Kipsigis, and the Yomut—have limited internal political complexity and are only peripherally involved in the politics of the modern state societies in which they are located.

Similarly, we discuss scarcity of land as a potentially important factor in the evolution of wealth inequality. Our proposal, however, is that once land becomes a scarce defensible resource, the potential exists for the emergence of significant inequality in wealth. This does not mean that land must be scarce due to population pressure, but only relative to effective demand. We agree with Håkansson that various forms of landscape modifications such as terracing, soil creation, or irrigation may exist in the absence of population pressure, but we argue that such modifications produce inequalities in land productivity that increase motivations to sequester land, thereby contributing to persistent wealth inequalities.

Origins of Inequality

Several commentators, particularly Boone and Kelly, are disappointed that our model (and resulting analysis) is not more comprehensive—that we do not directly tackle "the formation of social inequality." Our model, however, is clearly not designed to address this broad question; rather, it analyzes the stability or perpetuation of wealth inequality given certain material and socioeconomic constraints. We argue that degree of intergenerational wealth transmission (i.e., the correlation of offspring wealth with parental wealth, however instantiated) in conjunction with random economic shocks drives

wealth inequality to some long-run equilibrium value. We further propose that different types of wealth vary in their degree of transmissibility and that this (coupled with institutional and other factors) can help explain why societies vary so much in their observed levels of wealth inequality. This framework then allows us to discuss some of the questions that concern Boone and Kelly, but these inferences and speculations (found near the end of the four papers on production systems as well as in the concluding paper) are not direct consequences of the model per se.

However, let us briefly consider what Kelly poses as a key problem: given the "fierce egalitarianism" enforced through "leveling mechanisms" said to be characteristic of ancestral hunter-gatherers, what can we say about "why the leveling mechanisms stopped working" (p. 109)? One possibility is that new forms of material wealth made self-insurance through storage more feasible, reducing the importance of relational wealth. An example of this comes from Cashdan's (1985) comparison of !Kung groups with and without cattle, demonstrating how, when the option to reduce risk through private means becomes available, people do hoard, and this becomes more socially acceptable. Another reason that leveling mechanisms stopped working, or at least became attenuated, might be that the social creation of new forms of material wealth generated opportunities for controlling and thereby directly and indirectly transmitting inequalities in wealth. We sketch out a scenario along these lines in the concluding paper (as well as varieties of it in the other papers) but do not claim originality or direct derivation from our wealth-transmission model. It will require much future research to see if the dynamics of wealth transmission formalized in our model do indeed fruitfully interact with social and ecological factors in the manner suggested by such a scenario.

Conclusions

Kelly expresses disappointment that the main findings of this project are neither remarkable nor new. Ultimately this judgment is a matter of opinion rather than of fact or logic. However, we are skeptical that our findings merely corroborate received wisdom. For example, Kelly cites our finding that material wealth is more conducive to inequality than other forms as unsurprising, yet this is disputed in other commentaries and elsewhere in the literature. We have not encountered many publications that argue—let alone quantitatively demonstrate—that foragers and horticulturalists are virtually indistinguishable in their patterns of wealth inheritance and inequality or even that foragers lacking complex sociopolitical structures (as is the case with our sample) show levels of wealth inheritance and inequality persistence that are similar to those found in many industrialized societies. Similarly, our demonstration that pastoralists show levels of wealth inequality as high as densely populated farmers calls into question the widely held view of egalitarian pastoralists. Of course, these are preliminary findings, affected by possible bias in the sample of populations and other limitations as discussed above. But they surely constitute more than a simple corroboration of what everybody already knew about cross-cultural variation in wealth inheritance.

In conclusion, we thank the commentators for their often incisive comments on the set of papers in this special section. Given space constraints, we have not been able to address every comment, and in particular have mostly ignored those that endorse our efforts and findings and amplify their possible significance. We are pleased that most commentators perceive originality and explanatory value in our approach. We look forward to incorporating many of their suggestions in future research we are currently developing.

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