Discussions

Informant Rankings via Consensus Analysis

A Reply to Hill and Kintigh

Jeremy Koster

Department of Anthropology, P.O. Box 210380, University of Cincinnati, Cincinnati, Ohio 45221, U.S.A. (kosterjy@ucmail.uc.edu). 22 VII 09

Hill and Kintigh (2009) compellingly contend that, primarily because of the variation in daily return rates, it can be difficult for anthropologists to assess the relative skill of hunters by relying on small to moderate samples of observational data. The authors suggest that informant rankings might represent a better way to measure hunting skill. Accordingly, I note that the informal cultural consensus model (Romney, Batchelder, and Weller 1987) can provide a worthwhile alternative to the methods used in the studies cited by Hill and Kintigh.

As an example of this approach, I report on data collected during July 2008 in Arang Dak, a Mayangna and Miskito community in Nicaragua's Bosawas Reserve. In this study, photographs of all male household heads ($n = 29$) were randomly placed on a table and presented to a random sample of 41 adult informants in the community, who were asked to rank the men in order of hunting skill. These rankings were analyzed in UCINET (Borgatti, Everett, and Freeman 2002).

Consensus analysis is essentially a factor analysis of informants' responses, and consensus is generally inferred when the first factor accounts for at least three times as much variance as the second factor. In this case, the ratio of the first eigenvalue to the second eigenvalue is 27.83 : 1.25, thus surpassing the threshold for consensus. The first factor loadings, usually called the informants' "competence," provide information about the level of agreement because the square of the average competence is approximately equal to the average Pearson correlation coefficient between all pairs of informants (Weller 1987). For these rankings, the average competence is high (0.82 ± 0.07; range = 0.61–0.93), indicating that there is considerable agreement about the relative hunting skill of the male household heads. At this level of agreement, the sample size of 41 informants provides aggregated responses of high validity (Weller 2007).

The first set of factor scores, sometimes known as the "answer key," provide a weighted average of the informants' rankings. As with the Ache return rates, the aggregated rankings exhibit a convex age pattern (fig. 1).

How do the aggregated informant rankings compare to measures based on observational data? During a yearlong project in 2004–2005, I used focal observations and systematic interviews like those in the authors' report to collect a comparatively small data set of hunting returns (Koster 2008*a*, 2008*b*). All men in Arang Dak hunt opportunistically, but because some men do not embark on deliberate hunting trips, it is difficult to generate return rate estimates for all of the household heads. For the 24 men who were present in both study periods, however, it is interesting to note that there is a significant positive correlation between the informant rankings and the total amount of meat that they harvested (Pearson's $r = 0.594$; $P = .002$).

For the 13 household heads who embarked on multiple hunting trips in 2004–2005, their return rates (kg/h) were significantly correlated with the informant rankings (Pearson's $r = 0.573$; $P = .04$; see fig. 2). Although this small data set is subject to the same problems noted by Hill and Kintigh (2009), this result provides support for the utility of consensus analysis as a way to measure hunting skill. Yet, in this reduced sample of 13 hunters, the rankings still appear to be associated with the amount of meat harvested by hunters (Pearson's $r = 0.520$; $P = .07$), and the rankings are also correlated with cumulative time spent hunting (Pearson's $r = 0.597$; $P = .03$). Similarly, the return rates are significantly correlated with the amount of harvested meat (Pearson's $r = 0.923$; $P < .001$) and time spent hunting (Pearson's $r = 0.882$; $P < .001$). That is, there are clear relationships between the informant rankings, measured return rates, the overall productivity of hunters, and the cumulative time devoted to hunting during the 2004–2005 study period. Accordingly, although the ques-

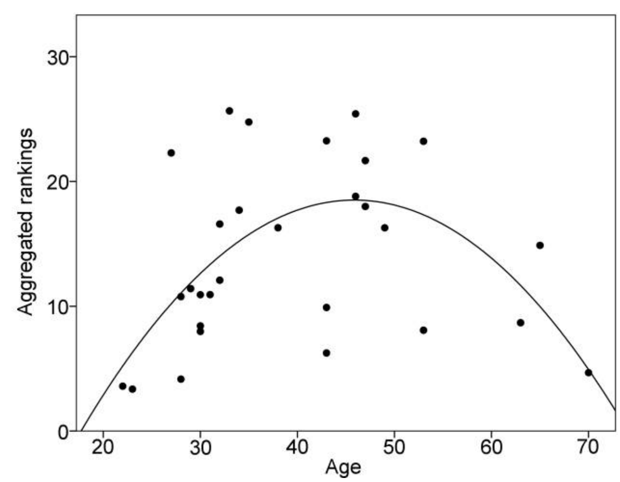

Figure 1. The best-fitting quadratic curve ($R^2 = 0.338$; $P = .005$) of age regressed on the aggregated rankings from consensus analysis. Note that higher numbers on the *Y*-axis represent greater skill.

 0011-3204/2010/5102-0005$10.00. DOI: 10.1086/651073

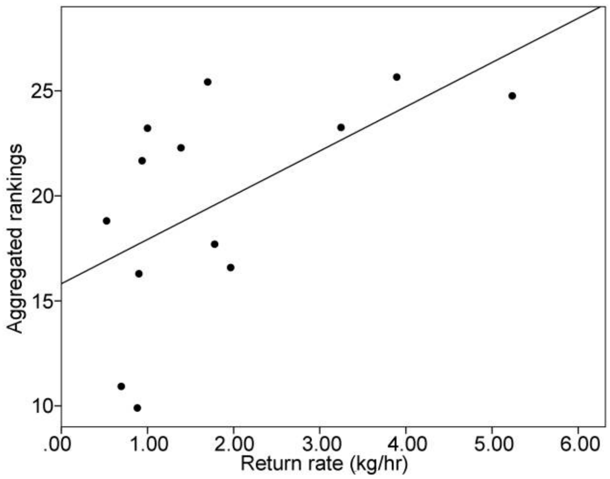

Figure 2. Correlation of hunting return rates and aggregated informant rankings.

tion posed to informants specifically referred to hunting skill, the informants could have generated similar rankings by focusing on these latter variables. These results therefore underscore the need to frame questions carefully, particularly in settings where skill is not associated with the frequency and productivity of hunting.

In general, consensus analysis has a number of advantages, particularly the diagnostics to assess the level of agreement and validity of informants' responses. These diagnostics are important because, as noted by Hill and Kintigh (2009), community members in some settings may be unable to distinguish good hunters from bad hunters. Alternatively, the rankings may exhibit various biases, such as those based on kinship relationships or age differences between informants and hunters. Because the second factor loadings can reveal agreement among subgroups (Boster 1986), such biases may be relatively easier to detect within a consensus analysis framework.

In conclusion, much as the effectiveness of observational data may vary across ecological settings, the benefits of consensus analysis may vary in different cultural settings. Consensus analysis (and informant rankings more generally) might therefore be viewed as a complement to observational data, not a replacement. Of course, much depends on the goals of the research. In some cases, perceptions of hunting ability may be more relevant than an objective measure of hunting ability.

Acknowledgments

This research was supported by a Fulbright student grant, the National Science Foundation (Dissertation Improvement Award 0413037), the Hill Foundation, a William Sanders dissertation grant, the University Research Council at the University of Cincinnati, and the Charles Phelps Taft Research Center. Ray Hames, Wesley Allen-Arave, Montserrat Soler, and Brooke Scelza provided helpful comments on an earlier draft.

References Cited

Borgatti, Steve P., Martin G. Everett, and Lin C. Freeman. 2002. UCINET for Windows: software for social network analysis. Harvard, MA: Analytic Technologies.

Boster, James S. 1986. Exchange of varieties and information between Aguaruna manioc cultivators. *American Anthropologist* 88: 428–436.

Hill, Kim, and Keith Kintigh. 2009. Can anthropologists distinguish good and poor hunters? implications for hunting hypotheses, sharing conventions, and cultural transmission. *Current Anthropology* 50(3):369–377.

Koster, Jeremy M. 2008*a*. Hunting with dogs in Nicaragua: an optimal foraging approach. *Current Anthropology* 49(5):935–944.

———. 2008*b*. The impact of hunting with dogs on wildlife harvests in the Bosawas Reserve, Nicaragua. *Environmental Conservation* 35:211–220.

Romney, A. Kimball, William H. Batchelder, and Susan C. Weller. 1987. Recent applications of consensus theory. *American Behavioral Scientist* 31:163–177.

Weller, Susan C. 1987. Shared knowledge, intracultural variation, and knowledge aggregation. *American Behavioral Scientist* 31:178–193.

———. 2007. Cultural consensus theory: applications and frequently asked questions. *Field Methods* 19:339–368.