Supplementary data for Ember et al. (accepted March 1, 2018) "Our Better Nature: Does Resource Stress Predict Beyond-Household Sharing?" *Evolution and Human Behavior*. In Press.

Variable Descriptions

SCCS_ID: numerical identifier for each society in the Standard Cross Cultural Sample

Language.family: Language family name, source: Retrieved from D-PLACE (Kirby et al. 2016)

socname: name of each society in the Standard Cross Cultural Sample

focyear: "Ethnographic Present" around which (-15 to +10 years) ethnographic materials were coded

region: world region as outlined in the Standard Cross Cultural Sample

Social_Complexity: Murdock and Provost's (1973) combined measure of 10 individual complexity variables. Data retrieved from Divale (2004).

ResourceStressFac: Factor score created using a PCA of the three individual resource stress measures (hazards, famine, and chronic scarcity; see below for more information on these variables)

The following three resource problem variables were previously coded by Ember and Ember (1992a, 1992b) from the ethnographic data for their research on warfare. Both famine and weather or pest disasters (other_hazards) were designed to tap unpredictable resource problems. Chronic scarcity taps predictable scarcity that occurs annually. Each was a 4-point scale with the highest score indicating the most resource stress. Only the more reliable scores were used (rel=>6) as indicated in Ember and Ember (1992b).

Famine: Famine, as defined by Ember and Ember (1992b:180) is, "a time of starvation when either many human deaths occur or it is reported that a substantial segment of the society has to move because of a lack of food."

Other_Hazards: Ember and Ember (1992b:180) define other hazards as "the incidence of severe weather or pest problems that may destroy food resources."

Chronic_Scarcity: Ember and Ember's (1992a, 1992b) measure of chronic resource problems (in regards to diet and food supply).

Definition of Sharing

As stated in section 1.1 of the main paper, we define beyond-household food and labor sharing as the non-coerced giving of aid from one or more household members to one or more individuals within other households. We excluded transactions such as clear monetary, barter, or other trade exchanges; coordinated labor in the form of parallel but separate efforts; or to coerced work. Sharing was coded on observed customary practices at the societal-level.

General Notes on Data Files

The sharing variables included in the data files are based on: 1) resolved ratings by two independent coders (as indicated in the variable name with either "_Resolved" or "_Res"); 2) some post-hoc inferred absence scores where noted below; and 3) merging of "absent" scores with "inferred absent" scores.

Specific Definitions and Procedures for Coding Food Sharing

To assess food sharing frequency and other sharing questions, coders were asked to use HRAF's *Outline of Cultural Materials* (OCM) subject categories to help find relevant paragraphs with pertinent information. The main OCM categories looked at were: 264 (eating), 431 (gift-giving), 476 (mutual aid), 574 (visiting and hospitality), 609 (behavior towards nonrelatives), and 731 (disasters). Coders were asked to use 512 (daily routine) if no or little information was found on daily sharing under the other categories. Because it is helpful to have a clear idea of the social units such as household and community before coding, we gave the Murdock and Wilson column 8 (Murdock and Wilson 1972) scores on household to the coders to help identify the typical household unit (e.g., monogamous family, large extended family.) Coders were also advised to look under additional OCMs such as 592 (household) and 621 (community structure). To judge whether sharing was seasonal it sometimes was necessary to look at annual cycle (OCM 221). The second and fourth authors were the coders for the food sharing variables.

The main coding questions and variables for food sharing are described in section 2.2.1 of C.R. Ember et al. (2018). In addition to these variables are subsidiary questions, which are described below. We only list the possible answers for informational purposes. As explained in the Supplement, the full scales were not that reliable, so we created dummy scores as explained in the next section. Only the dummy variables are provided.

If coders answered "yes" to questions S2 through S6, they were instructed to answer the following sub-questions (a through c) for each type of sharing (the variables are labelled S2a, S2b, S2c, etc):

a. What kind of food is shared (list kinds)? This was not included in our analyses and is not in the data file.

b. To what extent territorially is food shared outside the household? (0) No food is shared outside the typical household; (1) Food is shared at least between some people within a community; (2) Food is shared at least between all or most people within a community; (3) Food is shared with people from at least one or more neighboring communities; (4) Food is shared with people living at a considerable distance from the community.

c. With whom is food shared? (0) Food is rarely shared outside the typical household; (1) Usually with relatives; (2) Usually with relatives and nonrelatives; (3) With relatives, nonrelatives, and strangers.

S7. Not included in the data set

S8. Does food sharing occur in times of shortage or disasters? (0) No or rare; (0.5) Probably no or rare (inferred); (1) Yes, sometimes; (2) Yes, usually; (3) Yes, almost always.

Creation of Dummy Food Sharing Variables

The original coding questions stated asked coders to note the territorial extent of food sharing on a three point scale (between all or most people within a community, with people from at least one or more neighboring communities, or with people living at a considerable distance from the community) as well as with whom food sharing occurred on a three point scale (with relatives, with relatives and nonrelatives, or with relatives, nonrelatives, and strangers). In order to improve inter-coder reliability we condensed the coding scales for these two variables to distinguish between (0) food not shared beyond the community versus (1) food shared beyond the community for territorial extent and for sharing with nonrelatives (0) food not shared beyond relatives versus (1) food shared beyond the relatives (referred to in Figures 5-6 in the main text as "usually includes nonrelatives"). Collapsing the coding in this way produced reliable results. The resolved, dummy variables are labelled with the extension of "outside" or "non-kin" (Example: S2bRes_outside; S2cRes_nonkin.)

Post-Hoc Inferred Absence for Food Variables

Coders were often reluctant to infer the absence of a type of sharing where there was no explicit indication that a particular type of sharing did not occur (which was often the case since ethnographers rarely describe what they do not witness). In these cases coders often answered 99 (not enough information). Since the scores 99 and 88 (confusing information) were omitted from analysis as missing information, the results seemed to indicate that a greater proportion of cultures practiced particular types of sharing than might be true. In order to address this

issue we decided it would be appropriate to assume that if ethnographers discussed food sharing in general and some specific types of sharing, but did not discuss the type of sharing asked in a specific question, it is probably safe to infer that the type of sharing probably did not occur. The coders were asked what kinds of post-hoc inferences they would be comfortable with. These are the rules they came up with:

> a. If question S2 (daily sharing) was coded as 0 (no) or 1 (yes), and question S3 (sharing seasonally) was coded as 99 (don't know), then the 99 was changed to 0.7 (inferred no).

> b. Similarly, if question S3 was coded as 0 (no) or 1 (yes) and question S2 was coded as 99 (don't know), then the 99 was changed to 0.7 (inferred no).

> c. If question S5 (food sharing during life-cycle events) was coded as 0 (no) or 1 (yes), and question S4 (food sharing during religious/healing ceremonies) was coded as 99 (don't know), then the 99 was changed to 0.7 (inferred no).

We coded these new inferred absences with a score of 0.7 to distinguish them from the original inferred absences, which were scored with a 0.5. In analysis, we treated both the 0.5 (inferred no) and the 0.7 (new inferred no) scores as 0 (no); variable names ending in "TR" refer to the transformed no's. Food-sharing variables containing inferred absences are indicated in the variable name with "_IA_TR" (Example: S2_Resolved_IA_TR).

Food Sharing Summary Score

After inferring absence using the procedures described above, we created a summary score for the two highest frequency food sharing scores—daily sharing (S2) and seasonal sharing (S3). Variables were only summed when both variables had a score.

Specific Definitions and Procedures for Coding Labor Sharing

Coders were asked to read the OCM subject categories labor and leisure (461), cooperative organization (474), mutual aid (476). If little or no information was found on labor sharing, coders were asked to try OCMs for household (592), annual cycle (221), daily routine (512), exchange transactions (437), and the various OCMs describing food quest activities (220s), animal husbandry (230s) and agriculture (240s) to try to find appropriate information. The third author and a research assistant coded the labor sharing variables.

The original main coding questions and variables for food sharing are described in section 2.2.2 of C.R. Ember et al. (2018). In addition to these variables are subsidiary questions, which are described below:

If the coders answered "yes" (1) to questions LS2 through LS6 they were instructed to answer the following sub-questions (a through e) for each type of sharing (the variables are labelled LS2a, LS2b, LS2c, LS2d, LS2e, etc.). In this paper we only used data from sub-questions d and e.

  a) What kind of labor is shared? (List kinds.)

b) What form of sharing is the shared labor? (1) Generalized reciprocity between households on a dyadic basis; (2) Balanced reciprocity between households on a dyadic basis; (3) Communal labor benefitting community or part thereof; (4) Communal labor benefitting elites only; (5) Other (Explain. For example two or more types of activities apply). [Note: Generalized reciprocity refers to giving services or gifts without any expectation of return gift or service (Ember and Ember 2015, 166-168). Balanced reciprocity involves an immediate exchange of goods or services or an agreed-upon exchange over a limited period of time, but does not necessarily have to involve the same kind of work (Ember and Ember 1992a).

c) How is the labor arranged or coordinated? (1) Arranged between individual households; (2) Arranged by leaders (i.e., chiefs, big men, religious leaders, village or lineage headmen) without apparent coercion of community members; (3) Arranged by leaders with apparent or implied coercion; (4) Arranged by leaders but not clear if work is coerced or not; (5) Other (Explain. For example two or more types apply). [Note: Coordination of work refers to the degree to which households or members from different households coordinate their work activity but not actually help each other (Pryor 2005, 98).]

d) To what extent territorially is labor shared? (1) Among people within the community; (2) Among people within the community and between neighboring communities; (3) Among people between neighboring and more distant communities.

e) With whom is labor shared? (1) Almost always with only relatives; (2) With relatives and nonrelatives.

Creation of Dummy Labor Variables

The dummy variables we created for each type of labor sharing were: non-kin (0) labor not shared beyond relatives versus (1) labor shared beyond the relatives (referred to in Figures 5-6 in the main text as "usually includes nonrelatives"); outside community (1=sharing sometimes takes place outside the community) versus not outside (0=only local). Collapsing the coding in this way produced reliable results. The dummy variables are labelled with the extensions of "nonkin" or "outside" (Example: LS2d_outside_Res, LS2e_nonKin_Res.)

Post-hoc Inferred Absence of Labor Variables

As explained in the food sharing section, above, coders were often reluctant to infer the absence of a type of sharing where there was no explicit indication that a particular type of sharing did not occur. Therefore, we decided to make a post-hoc inferred absence score that the labor sharing coders were comfortable with. For labor sharing the rule was that if coders were able to say that labor sharing was present for two of the variables ranging from LS2 (daily) to LS5 (occasional), we could assume that the other variables originally marked "99" could be considered "inferred no" or probably absent (this rule is identified in the variable name with a

"2"). To distinguish these after the fact inferences from the original coder inferences, we marked these "0.7" to distinguish those scores that were inferred absent in the original coding. In analysis, we treated both the 0.5 (inferred no) and the 0.7 (new inferred no) scores as 0 (no). Labor sharing variables containing inferred absences are indicated in the variable name with "_IA_2" (Examples: LS2_Res_IA_2, LS3_RES_IA_2).

Labor Sharing Summary Scores

After inferring absence using the procedures described above, we created two summary scores. The first was for the two highest frequency labor sharing scores—daily sharing (LS2) and more than seasonal sharing (LS3). The second was for the three highest frequency labor sharing scores (daily through seasonal—LS2-LS4). Variables were only summed when both variables had a score.

Variable Definitions

All of the following variables (excluding summary scores) are dichotomous (1 = yes, 0 = no). For all ordinal score questions, codes "88" and "99" refer to "Confusing information" and "Not enough information to code," respectively.

 As noted earlier, "Res" or "Resolved" in a variable name indicates that the variable was resolved.

LS1_Resolved: "Does the typical household share labor (that is, work with or exchange labor) with other households or economic units outside the household?" (0)No; (1) Yes.

LS2_Res_IA_2: "Is labor shared outside the typical household daily or almost daily?" (0) No, including inferred no; (1) Yes.

LS3_Res_IA_2: "Is labor shared outside the typical household on occasions less than daily or almost daily but more than seasonally or a few times a year?" (0) No, including inferred no; (1) Yes.

LS4_Res_IA_2: "Is labor shared outside the household on a seasonal basis, e.g., hunting migratory animals or at harvest time?" (0) No, including inferred no; (1) Yes.

LS5_Res_IA_2: "Is labor shared outside the household a few times a year, e.g., building a house?" (0) No, including inferred no; (1) Yes.

LS2LS3Sum_IA_2: Sum of the two highest frequency labor sharing scores—daily sharing (LS2) and more than seasonal sharing (LS3).

LS2LS3LS4Sum_IA_2: Sum of the three highest frequency labor sharing scores (daily through seasonal—LS2-LS4).

S1_Resolved: "Is there any food of any kind shared outside the typical household?" (0) No; (1) Yes.

S2_Resolved_IA_TR: "Is food shared outside of the typical household on a daily or almost daily basis?" (0) No, including inferred no; (1) Yes.

S3_Resolved_IA_TR: "Is food shared outside the typical household frequently during certain seasons in ways different than the daily sharing of food above (i.e. during harvest or fishing season)?" (0) No, including inferred no; (1) Yes.

S4_Resolved_IA_TR: "Is food shared outside the typical household on an irregular basis during the year as a part of a religious ritual or healing ceremony, but not life-cycle event?" (0) No, including inferred no; (1) Yes.

SumS2S3_corrected: Sum of the two highest frequency food sharing scores—daily sharing (S2) and seasonal sharing (S3) (0 = none, 1 = one, 2 = both)

S5Resolved: "Is food shared outside the typical household on an irregular basis as a part of a life-cycle event, such as a marriage, funeral, or initiation rite, but not including brideprice or dowry?" (0) No; (1) Yes.

S6Resolved: "Is food shared outside the typical household on an irregular basis as a show of hospitality to visitors and travelers (not including the ethnographer)?" (0) No; (1) Yes.

S8Resolved: "Does food sharing occur in times of shortage or disasters?" (0) No; (1) Yes.

S2bRes_outside: (Outside the community) "Is food shared outside of the typical household on a daily or almost daily basis?" (0) food not shared beyond the community versus (1) food shared beyond the community for territorial extent and for sharing with nonrelatives

S3bRes_outside: (Outside the community) "Is food shared outside the typical household frequently during certain seasons in ways different than the daily sharing of food above (i.e. during harvest or fishing season)?" (0) food not shared beyond the community versus (1) food shared beyond the community for territorial extent and for sharing with nonrelatives

S4bRes_outside: (Outside the community) "Is food shared outside the typical household on an irregular basis during the year as a part of a religious ritual or healing ceremony, but not life-cycle event?" (0) food not shared beyond the community versus (1) food shared beyond the community for territorial extent and for sharing with nonrelatives

S5bRes_outside: (Outside the community) "Is food shared outside the typical household on an irregular basis as a part of a life-cycle event, such as a marriage, funeral, or initiation rite, but

not including brideprice or dowry?" (0) food not shared beyond the community versus (1) food shared beyond the community for territorial extent and for sharing with nonrelatives

S6bRes_outside: (Outside the community) "Is food shared outside the typical household on an irregular basis as a show of hospitality to visitors and travelers (not including the ethnographer)?" (0) food not shared beyond the community versus (1) food shared beyond the community for territorial extent and for sharing with nonrelatives

S2cRes_nonkin: (Nonrelatives) "Is food shared outside of the typical household on a daily or almost daily basis?" (0) food not shared beyond relatives versus (1) food shared beyond the relatives

S3cRes_nonkin: (Nonrelatives) "Is food shared outside the typical household frequently during certain seasons in ways different than the daily sharing of food above (i.e. during harvest or fishing season)?" (0) food not shared beyond relatives versus (1) food shared beyond the relatives

S4cRes_nonkin: (Nonrelatives) "Is food shared outside the typical household on an irregular basis during the year as a part of a religious ritual or healing ceremony, but not life-cycle event?" (0) food not shared beyond relatives versus (1) food shared beyond the relatives

S5cRes_nonkin: (Nonrelatives) "Is food shared outside the typical household on an irregular basis as a part of a life-cycle event, such as a marriage, funeral, or initiation rite, but not including brideprice or dowry?" (0) food not shared beyond relatives versus (1) food shared beyond the relatives

S6cRes_nonkin: (Nonrelatives) "Is food shared outside the typical household on an irregular basis as a show of hospitality to visitors and travelers (not including the ethnographer)?" (0) food not shared beyond relatives versus (1) food shared beyond the relatives

LS2d_outside_Res: (Outside the community) "Is labor shared outside the typical household daily or almost daily?" (0) Labor not shared beyond the community versus (1) labor shared beyond the community for territorial extent and for sharing with nonrelatives

LS2e_nonkin_Res: (Nonrelatives) "Is labor shared outside the typical household daily or almost daily?" (0) food not shared beyond relatives versus (1) food shared beyond the relatives

LS3d_outside_Res: (Outside the community) "Is labor shared outside the typical household on occasions less than daily or almost daily but more than seasonally or a few times a year?" (0) Labor not shared beyond the community versus (1) labor shared beyond the community for territorial extent and for sharing with nonrelatives

LS3e_nonkin_Res: (Nonrelatives) "Is labor shared outside the typical household on occasions less than daily or almost daily but more than seasonally or a few times a year?" (0) food not shared beyond relatives versus (1) food shared beyond the relatives

LS4d_outside_Res: (Outside the community) "Is labor shared outside the household on a seasonal basis, e.g., hunting migratory animals or at harvest time?" (0) Labor not shared beyond the community versus (1) labor shared beyond the community for territorial extent and for sharing with nonrelatives

LS4e_nonkin_Res: (Nonrelatives) "Is labor shared outside the household on a seasonal basis, e.g., hunting migratory animals or at harvest time?" (0) food not shared beyond relatives versus (1) food shared beyond the relatives

LS5d_outside_Res: (Outside the community) "Is labor shared outside the household a few times a year, e.g., building a house?" (0) Labor not shared beyond the community versus (1) labor shared beyond the community for territorial extent and for sharing with nonrelatives

LS5e_nonkin_Res: (Nonrelatives) "Is labor shared outside the household a few times a year, e.g., building a house?" (0) food not shared beyond relatives versus (1) food shared beyond the relatives

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