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9. ABSTRACT

An examination of the socio-cultural correlates of the fishing mode of subsistence. Its purpose is first, to facilitate understanding of fishing as a means of adaptation; second, to generate hypotheses to be tested by further field research; and third, to predict potential socio-cultural strain when the principal subsistence activity is being shifted either toward or away from fishing. The data on which this paper is based are drawn from two principle sources, Murdock's World Ethnographic Sample, and Murdock's Ethnographic Atlas. The correlates analyzed are the distribution of fishing societies; division of labor; co-occurrence of fishing with other subsistence activities; settlement patterns; community organization, kinship, and marriage patterns; social stratification and political organization; co-occurrence with other technologies; and finally, socialization, psychological characteristics, games, and religion.

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The Sociocultural Correlates  
of Fishing as a Subsistence Activity

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The Sociocultural Correlates of Fishing as a  
Subsistence Strategy

by

Richard Pollnac

The objective of this paper is to examine the sociocultural correlates of the fishing mode of subsistence. This examination can serve several purposes: First, it will facilitate an understanding of fishing as a means of adaptation; second, it can be used to generate hypotheses to be tested by further field research; and third, it can be used to predict potential sociocultural strain in situations where the principal subsistence activity is being shifted either toward or away from fishing.

The data on which this paper is based is drawn from two principle sources. Coult and Habenstein (1965) cross-tabulated 33 dimensions from Murdock's World Ethnographic sample of 565 societies (1961) and calculated coefficients of association ( $\phi$ ) and probabilities (Fisher's exact test) for every row and column value. The 33 dimensions include standard ethnographic categories such as basic economy (e.g. farming, fishing), sociopolitical organization (e.g. kinship, political integration), and settlement patterns. Textor (1967) derived coded data from a number of published and unpublished sources as well as 400 societies from Murdock's Ethnographic Atlas (1967). The diversity of his data sources resulted in varying sample sizes across different categories. Textor cross-tabulated the data and calculated chi-squares,  $\phi$ , and probabilities for each pair of variables. Tables were printed for

variables manifesting a chi-square with a probability less than .10.

With regard to the subsistence variable, fishing, the Ethnographic Atlas (Murdock 1967) did not distinguish between fresh and salt water fishing. Therefore the discussion of the socio-cultural correlates of fishing presented apply to both types of fishing. Despite the fact that the fishing variable examined is a composite variable, abstraction of its correlates from the mass of cross-cultural information is a first step in helping us to understand this important subsistence pattern.

Out of the 565 societies in the ethnographic sample, 7 percent have fishing as the principle subsistence activity. In this paper these societies will be referred to as "dominant fishing societies". In 6 percent of the societies, fishing shares the position of principle subsistence activity with some other such activity. These societies will be referred to as "codominant fishing societies". Fishing is important but not a major activity in 36 percent of the societies, and in 25 percent, it is present but unimportant. In the remaining 26 percent, fishing is absent, insignificant, or sporadic as a subsistence strategy. Data concerning fishing was unavailable for less than one percent of the societies.

DISTRIBUTION OF FISHING SOCIETIES IN THE SAMPLE Table 1 shows the geographical distribution of societies in the ethnographic sample manifesting different levels of fishing activity. It is apparent that the frequency of societies wherein fishing is either dominant or codominant is relatively low for most continents. This suggests either that fishing societies are in the minority or

Table 1. Geographical Distribution of Fishing Societies

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Fishing as Subsistence Activity	SOUTH AMERICA	NORTH AMERICA	INSULAR PACIFIC	EAST EURASIA	CIRCUM- MEDITER- RANEAN	AFRICA	TOTAL
dominant	5	20	4	6	0	4	39
codominant	8	10	13	1	1	0	33
important but not major or codominant	40	35	50	30	18	32	205
present but unimportant	16	14	20	24	23	43	140
absent, insig- nificant, or sporadic	8	31	10	24	36	37	146
no data	0	0	2	0	0	0	0

that there are some sampling errors.

DIVISION OF LABOR With regard to societies in which fishing is the dominant subsistence strategy, males do the fishing with negligible female participation in most cases (49 percent). In 26 percent of these societies both sexes participate with males conducting most of the activity. Males and females contribute equally in 8 percent and females contribute most in only 3 percent. 10 percent of the dominant fishing societies manifest a division of labor in which males do the major fishing and/or marine hunting while females conduct minor shore or reef fishing and/or shell fishing. Data were unavailable for 5 percent of these societies.

In societies where fishing is codominant with some other subsistence activity, 39 percent manifest the pattern where the males do the major fishing and/or marine hunting while females conduct minor shore or reef fishing and/or collect shellfish. In 33 percent of the codominant societies males fish with negligible female participation. Both sexes participate with males predominating in 18 percent of the societies and both sexes contributing equally in only 3 percent. Data was unavailable for 6 percent of the codominant societies.

Overall, males conduct most of the fishing activity in the societies in the ethnographic sample. Of the 350 societies for which data concerning the division of labor in fishing is available, both sexes participate equally in only 10 percent of the cases and female participation predominates only 5 percent.

COOCCURRENCE OF FISHING WITH OTHER SUBSISTENCE ACTIVITIES Where fishing is the dominant subsistence activity we find that agriculture is absent, unimportant, or recent in 82% of the societies and gathering of plant foods is important in the majority (53%). Among codominant fishing societies, 30% cultivate roots or tubers, 27% cultivate tree fruits or starches, 3% cultivate grain crops, 27% gather plant foods, and 12% hunt land animals. Turning to societies where fishing is important but not dominant or codominant, we find that 40% cultivate grain crops, 35% root crops, 5% tree fruits or starches, 13% gather wild plant foods, and 6% hunt land animals. 68% of the societies where fishing is absent or unimportant are cultivators of grain crops. Where fishing is codominant with some other activity, this activity is agriculture in 55% of the cases.

Overall, where fishing is the dominant or codominant subsistence activity domesticated animals are absent or unimportant in 74% of the cases. Where domesticated animals are present, they tend to be the smaller ones (e.g. donkeys, goats, pigs). In only one case is fishing codominant with animal husbandry. Where fishing is the dominant subsistence activity, hunting and gathering is the most <sup>important</sup> secondary activity in 82% of the cases. Hunting and gathering is codominant with fishing in 44% of the cases. In 52% of the societies where fishing is important but not dominant or codominant, hunting and gathering is either dominant, codominant with some other activity, or also important.

SETTLEMENT PATTERNS Settlement patterns tend to be compact villages (54%) or seminomadic (33%) in societies where fishing is the dom-

inant subsistence activity. The remainder are either fully nomadic (10%) or compound settlements with nuclear villages and satellite homesteads or hamlets (3%). In comparison with other societies dominant fishing societies tend to be seminomadic ( $\phi = .139$ ;  $p = .001$ ) and have no city or town present and an average community size of less than 200 ( $\phi = .174$ ;  $p = .009$ ).

Where fishing is codominant with some other subsistence activity 48% of the settlements are compact villages and 30% are either fully or seminomadic. The remainder are either clusters of separate hamlets (10%) or neighborhoods of dispersed homesteads (6%).

COMMUNITY ORGANIZATION, KINSHIP, AND MARRIAGE PATTERNS No aspects of local kinship based community organization or family form serve to significantly differentiate either dominant or codominant fishing societies from other societal types. With respect to household form, we find that dominant fishing societies tend to have more lineal family households than other societies ( $\phi = .129$ ;  $p = .003$ ). A lineal family household is characterized by an entire lineal (small extended) family occupying a single dwelling. 31% of the societies wherein fishing is the dominant subsistence activity manifest this type of household. Additionally, there is a weak, but statistically significant tendency for both dominant and codominant fishing societies to have fewer mother-child households than other societies ( $\phi = .08$ ;  $p < .04$ ). A mother-child household is composed of a married female and her offspring occupying a single dwelling with the husband living separately.

As with other societies, most fishing societies practice patrilocal residence. It is interesting to note, however, that out of the 4 duolocal societies in the sample of 565, 2 are in societies where fishing is the predominant subsistence activity. This distribution is statistically significant ( $\phi = .102$ ;  $p = .026$ ), but should be viewed with caution because of the extremely low frequency of this residence pattern. A duolocal residence pattern consists of an absence of common residence, with both spouses continuing to live with or near their own kinsmen.

There is a slight tendency for dominant fishing societies to practice general polygyny in comparison with other societies ( $\phi = .089$ ;  $p = .024$ ). The polygynous unions are preferential, common ( $> 20\%$ ), and not reported to be either exclusively non-sororal or preferably sororal. The distribution of other marriage types do not serve to distinguish fishing societies.

Gift exchange at marriage is more common among dominant fishing societies than other societies ( $\phi = .226$ ;  $p < .001$ ). Gift exchange involves reciprocal exchange of substantial gifts or a continuing exchange of equivalent goods and services between relatives of the bride and groom. Other types of considerations at marriage do not serve to differentiate fishing societies from other societies.

Patrilineal kin groups are significantly absent from dominant fishing societies in comparison with other societies ( $\phi = .133$ ;  $p = .001$ ). Matrilineal kinship groups are also predominantly absent, but their absence does not significantly differentiate

dominant fishing societies ( $\phi = -.020$ ;  $p = .310$ ). It is interesting to note however, that exogamous matrilineal moities are more common in dominant fishing societies (15%) than other societies (4%). This difference is statistically significant ( $\phi = .128$ ;  $p = .005$ ). In comparison with all other societies, dominant fishing societies are proportionately more bilateral. 51% of the dominant fishing societies are bilateral in contrast to 25% of other societal types ( $\phi = .140$ ;  $p = .001$ ).

The distribution of cousin marriage rules and cousin terminology do not serve to differentiate dominant fishing societies from other societies. However, there is a tendency to bifurcate collateral avuncular terminology among dominant fishing societies: 49% of the dominant fishing societies as opposed to 20% of other societies bifurcate collateral avuncular terminology ( $\phi = .172$ ;  $p < .001$ ). The bifurcation of collateral avuncular terminology refers to the existence of distinct elementary terms for father, father's brother, and mother's brother.

SOCIAL STRATIFICATION AND POLITICAL ORGANIZATION With respect to differentiation of freemen, dominant fishing societies manifest a lower proportion of complex stratification into three or more classes or castes than do other societal types combined ( $\phi = .101$ ;  $p = .004$ ). Where class stratification is present in dominant fishing societies it tends to be based more on wealth ( $\phi = .150$ ;  $p = .033$ ) and something other than occupational status ( $\phi = .146$ ;  $p = .037$ ) as compared to other societies. The distribution of slavery does not distinguish fishing societies.

The political integration of dominant fishing communities is characterized by politically independent local groups not exceeding 1,500 in average population. These autonomous local communities are proportionately more common in dominant fishing societies than in other societies (62% versus 38% respectively;  $\phi = .114$ ;  $p = .004$ ). The same is true for societies wherein fishing is codominant with some other subsistence activity ( $\phi = .191$ ;  $p < .001$ ). In keeping with this low level of political integration, there is a strong tendency for codified laws to be unimportant or absent ( $\phi = .544$ ;  $p = .025$ ) and individual rights in real property or rules of inheritance to be absent ( $\phi = .170$ ;  $p = .005$ ) in dominant fishing societies as compared to other societies.

COOCCURRENCE WITH OTHER TECHNOLOGIES Dominant fishing societies tend to lack metal working ( $\phi = -.269$ ;  $p < .001$ ), weaving ( $\phi = -.143$ ;  $p = .025$ ), and pottery technologies ( $\phi = -.275$ ;  $p < .001$ ) in comparison to societies where fishing is not the dominant subsistence pattern. Overall this suggests that the level of technological development of dominant fishing societies tends to be rather low.

SOCIALIZATION, PSYCHOLOGICAL CHARACTERISTICS, GAMES, AND RELIGION

In comparison to societies where fishing is not the dominant mode of subsistence, male genital mutilation tends to be absent in dominant fishing societies ( $\phi = -.119$ ;  $p = .031$ ). This finding in combination with the tendency in dominant fishing societies for the mother and nursing child to sleep in separate beds ( $\phi = -.278$ ;

$p < .05$ ), the tendency for exclusive mother-son sleeping arrangements to last less than one-year ( $\phi = .280$ ;  $p = .064$ ), and the presence of bellicosity to be moderate or negligible ( $\phi = .255$ ;  $p = .017$ ) tends to support a recent model advanced by Whiting to explain male genital mutilation (1964). Whiting presents a complex model relating availability of protein, exclusive mother-child sleeping arrangements, long post-partum sex taboos, and circumcision rites. The model is too complex to be discussed in this context, but the relative absence of protein malnutrition in fishing societies in combination with the above noted relationships fit perfectly into Whiting's model.

With regard to games, where present dominant fishing societies have fewer games of strategy than other societies ( $\phi = -.234$ ;  $p = .002$ ).

Finally, with respect to religion, a high god tends to be absent in dominant fishing societies ( $\phi = .232$ ;  $p < .001$ ) as compared to other societies.

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