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Sociocultural Correlates of Success Among  
Small-scale Fishermen in Northwest  
Costa Rica  
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INTRODUCTION The principal goal of most international development agencies today is to provide for the basic human needs of the poor of the world. This basic human needs approach to development is rather clear in its emphasis on improving the health status, nutrition, education, water supplies, and shelter of the world's poor. The approach, however, also stresses the satisfaction of non-material needs such as "participation, cultural identity, and a sense of purpose in life and work" (Streeten 1979:30). This perception of basic human needs suggests that their satisfaction must be accomplished in a locally appropriate manner if we are to achieve the stated goals.

If it can be assumed that in most societies individuals perceived as successful will have achieved satisfaction of their basic human needs to a greater extent than the less successful, then the examination of the sociocultural correlates of success within a given society will provide some indication of locally appropriate factors contributing to satisfaction of basic needs. This approach is suitable to the above conceptualization of basic human needs because it is more likely to result in satisfying non-material needs such as cultural identity and participation than an approach which is based on outside perceptions (by "experts") of what is best for potential participants. The sociocultural correlates of success, then, will be viewed as locally appropriate adaptations which have contributed to success, and therefore satisfaction of basic needs, in the target population.

Very few studies have investigated the correlates of success among small-scale fishermen, a fact which makes it difficult to generate hypotheses to guide the present research. Poggie (1979) has found relatively weak, but statistically significant correlations between success as a fisherman and a deferred gratification orientation, years fishing experience, and boat size within a small sample of Puerto Rican fishermen. Poggie, Bartee, and Pollnac (1976) using more independent variables and 'two measures of success'<sup>1</sup> found relatively weak, but statistically significant negative correlations between at least one of the measures of success and age, facility with the English language, and travel to the U.S.A., and positive correlations with years of formal education, annual income, perceived progress over the last five years, and a deferred gratification orientation. The present study will examine the relationship of success as a fisherman with some of these same variables as well as some others which are potentially related to success. At this stage of knowledge concerning locally appropriate predictors of success, the approach followed will be exploratory with no formal hypotheses stated.

SAMPLE A sample of 70 small-scale fishermen were interviewed at four locations on the northwest coast of Costa Rica between Playa del Coco and the Nicaraguan border. Thirty-nine were interviewed at Playa del Coco, a relatively popular resort area located in Bahia el Coco in the Gulf of Papagayo. Approximately 40 kilometers of black-top, all weather road links Playa del Coco with Liberia, the closest population center (population approximately 11,000), which is on the Interamerican Highway 216 kilometers from San Jose. Twenty-three fishermen were interviewed at Cuajiniquil

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<sup>1</sup>One emic and one etic measure. These measures are briefly discussed below.

located on Bahia de Cuajiniquil approximately 50 air-kilometers northwest of Liberia. An all-weather road linking Cuajiniquil with the Interamerican Highway was undergoing construction at the time the research was conducted. Finally, eight fishermen were interviewed at Jobo on the Gulf of Santa Elena and Puerto Soley in Bahia de Salinas approximately 5 kilometers from the Nicaraguan Border.

Most of the small-scale fishermen in the sample (77%) fish from open dugout vessels, approximately 18 to 24 feet long, powered by outboard motors. Others use vessels (primarily dugout but two large fiberglass vessels were in the sample) from 24 to 30 feet in length with inboard motors and cabins (launchas). Type of gear used was principally the gill net. Monofilament gill nets are the most frequently used type at Playa del Coco (used by 77% of the fishermen), while further north 90% of the fishermen interviewed use multifilament nets either alone or in combination with long or hand lines. Only one fisherman interviewed at Cuajiniquil used a monofilament gill net. Finally, seven of the fishermen were divers (six at Playa del Coco and one at Cuajiniquil) who captured various shell fish including the spiny lobster.

Overall, the fishermen at Playa del Coco have much more contact with modern Costa Rican society because of the relatively easy access to Liberia and the quantity of Costa Rican and other tourists who frequent the area. Manifestations of the impact of this contact among small scale fishermen can be found in differences in level of technology (the high frequency of use of the relatively modern monofilament gill net at Playa del Coco) and levels of formal education (a mean of six years at Playa del Coco as opposed to four years among the fishermen farther north). In the analysis section the sample of fishermen from north of Playa del Coco will be referred to as the "North Sample."

TESTS    The Dependent Variable, Success was determined by asking key informants (middlemen who had been buying fish from the fishermen for years) to rank each fisherman as being a very good, good, or average fisherman.<sup>1</sup> These evaluations were assigned values of three, two, and one respectively. Poggie (1979) has demonstrated that there is a high degree of reliability with respect to such rankings. Further, the goal of establishing a culturally relevant measure of success is more likely to be obtained using key informants from the target population. For example, Poggie, Bartee, and Pollnac found that a panel of key informants from a Puerto Rican fishing community rank ordered a sample of small-scale fishermen according to degree of success (an emic measure) differently than the North American researchers (an etic measure). The correlation between the two scales was statistically significant ( $r = .69$ ,  $p < .001$ ) but relatively low as a measure of reliability. The amount of variance in one measure that could be explained by the other was only 48%. Further, differences in the empirical correlates of the two measures clearly indicated that the rankers were using different criteria. For example, annual income was more highly related to the etic than the emic measure (.45 versus .29 respectively). In addition, the emic measure manifested statistically significant positive correlations with a self-rating of religiosity and years fishing experience and negative correlations with speaking English and travel to the USA. None of these four variables were related to the etic measure. It is therefore suggested that the key informant ranking of

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<sup>1</sup>In general, Costa Ricans have a tendency to avoid saying anything negative about a person; thus, 'poor fisherman' was not used as a category.

success is more appropriate in analyses aimed at the basic needs approach to development since it is more likely to include aspects of success which are culturally appropriate, thus more likely to satisfy the non-material aspects of basic needs and less likely to be rejected by the target population.

In addition to this emic measure of success, the study also examines the correlates of several other indices of success as a fisherman in Costa Rica: (1) boat ownership, and (2) income during the past three months coded into three categories,  $<1500C$ ,  $\bar{1500}<3000C$ , and  $>3000C$ , which were assigned the values one, two, and three respectively.<sup>1</sup> A composite measure of success was formed by summing these three scales resulting in a measure that ranges between two and seven. We will refer to this scale as SUCCOMP.<sup>2</sup>

Independent variables such as age, years fishing experience, and education were determined by responses to direct questions. Income variability was determined by subtracting the minimum monthly income from the maximum and dividing by the maximum. This results in an index which varies between zero and one, with one indicating maximum variability and zero no variability.

Self-evaluation of socio-economic position, perceived socio-economic progress, and perceptions of future position were determined with the use of the ladder of life test (Cantril 1963). The ladder of life test consisted of showing the respondent a ladder diagram with ten rungs. He was told that

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<sup>1</sup>It is difficult to obtain precise income data from most fishermen with respect to an identifiable time period due to fears of taxation. Maximum and minimum monthly income data do not suffer from this problem. Approximately 8.5C = \$1.00 U.S.

<sup>2</sup>Item totals for this scale range between 0.50 and 0.76 ( $p < .01$ ).

the top rung represented the best possible life, and the bottom the worst. He was then requested to tell where he felt he stood on the ladder at the present time ( $T_0$ ), five years in the past ( $T-5$ ) and five years in the future ( $T+5$ ). The respondent was also requested to tell what he would do to arrive at the  $T+5$  position.<sup>1</sup>

Three items were used to determine future investment orientations (FIO).<sup>2</sup> The first item involved the question concerning what the fisherman felt he must do to arrive at the state he projected for  $T+5$ . The responses to this item were content analyzed, and those manifesting a plan to save or invest were assigned a value of one and all others a value of zero. The other two items were derived from two questions: (1) If you were to receive 1500C as a gift or inheritance what would you do with it? and (2) If you were to receive 8500C as a gift or inheritance what would you do with it? Responses to these two questions were content analyzed and classified as deferred if the response reflected an investment for future gain (e.g. purchase fishing equipment, put in a bank, etc.) or immediate if lacking an investment factor (e.g., buy clothing, alcohol, etc.). The immediate category was assigned a value of zero and the deferred a value of one. The values assigned to these three items were then summed, resulting in a scale which varied between zero and three, with zero indicating a lack of future investment orientation and three a maximum future investment of orientation (FIO).

Perceptions of relative independence were determined with the use of the semantic differential (cf. Osgood, Suci, and Tannenbaum 1957).

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<sup>1</sup>See Pollnac (1979) for analyses of these variables as dependent variables.

<sup>2</sup>Ibid.

As part of a larger semantic differential test, fishermen were requested to rank both fishermen and farmers with respect to independence on a seven-point bi-polar scale ranging from independent (independiente) to dependent (dependiente). Values for farmer were subtracted from those for fisherman to obtain a value indicating the relative degree of independence a fisherman has in comparison to a farmer as perceived by the fishermen. This value is then treated as a projective index of how independent the individual fisherman perceives himself. Poggie (1980) has argued that independence is an adaptive characteristic among fishermen; thus, one would expect that independence would be related to degree of success as a fisherman.

Gear types were ranked according to relative sophistication with a monofilament gill net receiving a rank of one and no gear (diver, without any gear) a rank of six. Boat type was ranked on a scale ranging from one to three with a simple outboard vessel receiving a rank of one, a wooden launcha with a small cabin and inboard motor a rank of two, and a fiberglass launcha with an inboard motor a rank of three.

ANALYSIS Table 1 presents the zero-order correlations between the success measures and the independent variables for the total sample.

Table 1 indicates that there is only one correlate of the emic success measure--perceived progress over the past five years ( $T_0 - T-5$ ). This is almost a non-finding since  $T_0 - T-5$  should be greater for the more successful fishermen. Boat ownership has no significant correlates, while the income scale manifest significant positive correlations with age, years of fishing experience, number of dependents, having a farmer father (coming from a farm background), perceived progress over the past



Table 1. Zero-order correlations between independent and dependent variables for total sample.

<u>Independent Variables</u>	<u>DEPENDENT VARIABLES</u>			
	<u>Success Rank</u>	<u>Boat Owner</u>	<u>Income Scale</u>	<u>SUCCOMP</u>
1. Age	.16	.08	.42**	.35**
2. Years fishing experience	.02	-.08	.30*	.15
3. Number of fishermen kin	.06	.18	.02	.10
4. Boat type	-.05	-.10	.15	.02
5. Number of family on your vessel	.07	.06	.14	.13
6. Gear type	-.04	.05	.07	.03
7. Days per-week fishing	-.02	.07	-.21	-.11
8. Number of dependents	.22	.16	.46**	.43**
9. Years of formal education	.03	.06	-.25**	-.10
10. Father farmer	.08	-.01	.35**	.23
11. Father fisherman	-.14	.04	-.02	-.08
12. $T_0 - T-5$	.28*	.09	.24*	.32**
13. $T+5 - T_0$	-.11	.11	.15	.05
14. $T+5 - T-5$	.17	.17	.32**	.33**
15. FIO	-.07	.15	.10	.06
16. Income variability	.23	-.02	.06	.16
17. Independence	.06	.04	.16	.13

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N = 70

\* =  $p < .05$

\*\* =  $p < .01$

five years and from five years in the past to five years in the future. There is a surprising negative correlation between years of formal education and the income scale. SUCCOMP manifests a rather similar profile of correlations except that it does not significantly correlate with farmer father or years of formal education.

Other analyses (e.g. Pollnac 1979) have indicated that there are considerable differences between the two subsamples of the sample used here; thus, relationships between the independent and dependent variables in the North and Playa del Coco samples were calculated and can be found in Table 2.

Table 2 indicates that there are regional differences in the correlates of the various success measures. Both age and years experience as a fisherman are correlated with the income scale and SUCCOMP only in Playa del Coco. The correlation with SUCCOMP is most likely due to the high correlations these variables have with the Income Scale. Number of kin fishing is correlated with boat ownership in Playa del Coco, and number of dependents is strongly correlated with success rank in the North, income in both samples, and SUCCOMP only in the North. The relatively strong relationships that both success rank and income have with number of dependents in the North is significant because income and success rank are not highly correlated ( $r = 0.29, p > .05$ ); thus, this variable is correlated with two relatively independent aspects of success.

Another interesting finding is that having a father who was a farmer is positively correlated with income, and having a fisherman father is negatively correlated with the success ranking in the North sample. Finally, perceived progress is positively correlated with success only in the North.

Table 2. Zero-order correlations between independent and dependent variables for Playa del Coco (PC) and North (NO).

Independent Variables	Success Rank		Boat Owner		Income Scale		SUCCOMP	
	PC	NO	PC	NO	PC	NO	PC	NO
1. Age	.19	.07	.13	-.01	.48*	.33	.43*	.22
2. Years of fishing experience	.07	.02	.08	-.33	.44*	.24	.31*	.04
3. Number of fishermen kin	.12	.02	.35*	-.08	.12	-.11	.26	-.00
4. Boat type	.05	-.23	.13	-.40	.25	.00	.21	-.25
5. Number of family on your vessel	.22	-.15	.12	.02	.21	.10	.29	-.02
6. Gear type	-.18	.10	-.03	.03	.07	-.30	-.03	-.10
7. Days per-week fishing	.08	-.10	-.02	.16	-.24	-.18	-.09	-.10
8. Number of dependents	.01	.51**	.09	.20	.42*	.49**	.27	.60*
9. Years of formal education	.09	.04	-.10	.30	-.23	-.22	-.10	.00
10. Father farmer	.00	.15	-.15	.11	.28	.39*	.11	.33
11. Father fisherman	.03	-.44*	.28	-.30	.09	-.13	.16	-.39*
12. T <sub>0</sub> - T-5	.18	.38*	.02	.14	.12	.34*	.18	.43*
13. T+5 - T <sub>0</sub>	-.18	-.06	.12	.06	.09	.18	-.03	.09
14. T+5 - T-5	.02	.30	.12	.16	.19	.41*	.16	.43*
15. FIO	-.03	-.15	.05	.24	.17	.00	.09	.00
16. Income variability	.18	.25	-.06	-.06	-.08	.15	.05	.20
17. Independence	.07	.01	.09	-.04	.28	.00	.23	-.01

PC N = 39; NO N = 31

\* = p < .05

\*\* = p < .01

The patterning of significant correlation coefficients in Table 2 suggest that it would be interesting to examine the multiple correlations between the independent variables and success rank, income, and SUCCOMP for the North sample. Due to the relatively low correlations for Playa del Coco, only the multiple effects of the independent variables on income will be examined for that sample. Finally, we will examine the multiple predictors of both income and SUCCOMP for the total sample. The technique used will be step-wise multiple regression. In this technique, the independent variable which explains the most variance in the dependent is entered first. The next variable to enter is the one that explains the most variance with the first controlled. This procedure is continued until all variables are entered or a previously set criterion is reached. In the analysis presented here, no variables are entered unless their F Ratio to enter is at least 3.0.<sup>1</sup> The results of these analyses can be found in Tables 3 through 5.

The stepwise multiple regression brings out some relatively interesting patterns with respect to the multiple determinants of the various success measures. First we can note that, overall, the multiple correlations are relatively high. The strongest is found in the North Sample where six variables account for 67 percent of the variance in success rank ( $R = .82$ ).

Turning to the multiple predictors of income, it can be seen in Table 3 that for the total sample the strongest predictor is number of dependents ( $r = .46$ )--the more the dependents, the higher the reported

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<sup>1</sup>approximate level for  $p = 0.05$  for a partial correlation with more than two variables controlled.

Table 3. Stepwise Multiple Regression of  
Independent Variables on Income

<u>Variable entered and controlled</u>	<u>Partial to enter</u>	<u>Multiple R with income</u>
	<u>Total Sample</u>	
Number of dependents	--	.46
Farmer father	.29	.53
Number of family on vessel	.30	.59
Age	.22	.61
Own boat	.22	.64
	<u>Playa del Coco</u>	
Age	--	.48
Farmer father	.31	.55
Number of family on vessel	.32	.61
Independence	.29	.66
Father fisherman	.36	.71
	<u>North</u>	
Number of dependents	--	.49
(T+5) - (T-5)	.40	.60

Table 4. Stepwise Multiple Regression of  
Independent Variables on SUCCOMP.

<u>Variable entered and controlled</u>	<u>Partial to enter</u>	<u>Multiple R with SUCCOMP</u>
	<u>North</u>	
Number of dependents	--	.60
(T+5) - (T-5)	.45	.70
Fisherman father	-.38	.75
	<u>Total Sample</u>	
Number of dependents	--	.43
(T <sub>0</sub> ) - (T-5)	.32	.52

Table 5. Stepwise Multiple Regression of  
Independent Variables on Success Rank, North.

<u>Variable entered and controlled</u>	<u>Partial to enter</u>	<u>Multiple R with success rank</u>
Number of dependents	--	.51
(T <sub>0</sub> ) - (T-5)	.37	.60
Fisherman father	-.39	.68
Education	.45	.75
Farmer father	-.39	.80
Age	-.33	.82

income. After this variable is controlled, farmer father manifests the highest partial correlation with income (0.29); thus, it is entered in combination with number of dependents resulting in a multiple R of 0.53. This indicates that after controlling for the effects of number of dependents, those with farmer fathers are likely to have higher incomes, and that in combination, the two variables account for 28 percent (0.53 squared) of the variance in income. Number of family members on ego's vessel, age, and boat ownership are also positively related to income when previously entered variables are controlled. The remainder of Table 3 can be interpreted in a similar manner.

In Table 4, the analysis for the North Sample manifests a negative partial correlation between fisherman father and SUCCOMP. This indicates that when number of dependents and perceived and projected progress from five years in the past to five years into the future are controlled, those with other than fisherman fathers are likely to have a higher SUCCOMP value. There are also negative partial correlations with respect to fisherman and farmer father, as well as age, in the multiple regression analysis of success rank in the North Sample. These negative partials in Table 5 are interpreted in the same manner as those in Table 4.

DISCUSSION The analysis makes it clear that there are differences between the correlates of the various success measures at Playa del Coco and North. For example, age and years fishing experience are relatively strong predictors of the income measure at Playa del Coco, while in the North the zero order correlation does not differ significantly from zero. Examining the multiple regression analysis (Table 5), however, it can be

seen that, in fact, age is negatively correlated with success rank in the North after the effects of five previously entered variables are controlled. The relationship of both age and years fishing with income in Playa del Coco is best explained by the logical relationship between years fishing and fishing experience which should affect income. Overall, older fishermen have had the opportunity to fish longer, thus should have more experience, and thus more income. In fact, the correlation between age and years fishing experience in the total sample is 0.70 ( $p < .01$ ). The relationship between age and fishing experience is most clearly evident in Playa del Coco where there is a longer tradition of fishing ( $r = 0.91$ ), while in the North where there is less of a fishing tradition this correlation is only 0.30 ( $p > .05$ ). Fishermen in Playa del Coco have fished an average of 11.9 years as contrasted to only 6.0 in the North ( $t = 2.97$ ,  $p < .01$ ). Thus, in the Playa del Coco sample, years fishing experience would have a greater potential to affect income. In the North sample, older fishermen without the benefit of years of experience might be overall less effective than younger fishermen with the same amount of experience due to the effects of age in a physically demanding occupation (cf. Pollnac 1976); hence, accounting for the negative partial correlation between age and success rank in the North sample.

Another variable which stands out with respect to differences between the two samples is having a father who is or was a fisherman. In the North, both the zero-order and partial correlations indicate a relatively strong negative correlation with success rank. The Playa del Coco sample manifests no significant zero-order correlations with father fisherman, but does manifest a significant partial correlation



between this variable and income when four previously entered variables are controlled in the multiple regression analysis (Table 3). Once again, however, we find opposite relations in the two areas. It is difficult to explain this negative relationship in the North unless we speculate that making a living in the North from fishing was so difficult in the recent past (prior to construction of the all-weather road) that only a person who could do nothing else would follow his father's footsteps into fishing. This type of person would probably be less successful than those who chose the occupation later, when it became more profitable.

Number of dependents is the only independent variable which is consistently related to at least one of the success variables in both samples. This variable is positively correlated with income in both samples as well as manifesting a strong positive correlation with success rank in the North. It is also a relatively strong correlate of SUCCOMP.

It is difficult to propose a causal direction for this relationship. First, it could be hypothesized that fishermen with more dependents must work harder to support them. Alternatively, one could suggest that more successful fishermen tend to have more dependents because they are able to support them. In Playa del Coco, number of dependents is strongly correlated with both age ( $r = 0.67$ ) and years fishing experience ( $r = 0.64$ ). The correlation between age and years fishing experience is 0.91. Thus, the significant correlation between number of dependents and income may be due to its high correlation with years fishing (or fishing experience) which has a more straight-forward logical relationship with income. In the North sample, although age is related to number of dependents ( $r = 0.43$ ,  $p < 0.01$ ), it is not significantly related to either income

( $r = 0.33$ ,  $p > 0.05$ ) or success rank ( $r = 0.07$ ,  $p > 0.05$ ). In the North, number of dependents seems to be acting as a mediating variable between age and the two success variables since age is obviously a variable antecedent to number of dependents. The lack of relationship between age, years fishing experience, and success in the North was discussed above. Clearly, more in-depth research is needed to answer these questions.

Perhaps what is most surprising about the analysis is that the hardware, the equipment, rarely enters into any of the stepwise multiple regressions because of its low correlation with the various success measures. It is always the software--the social variables--which are the strongest predictors of success. The only time that equipment appears to influence success is that for the total sample, boat ownership marginally affects income. One is therefore justified in questioning whether or not inputs of more sophisticated equipment are justified as a principal means of increasing income to individual fishermen in situations where increased income is the primary goal of the development project.

REFERENCES CITED

- Cantril, H.  
1963 A study of aspirations. *Scientific American* 108:41-45.
- Osgood, G., G. Suci, and P. Tannenbaum  
1957 *The Measurement of Meaning*. Urbana, Illinois: University of Illinois Press.
- Poggie, J.  
1980 Small-scale fishermen's psychocultural characteristics and cooperative formation. *Anthropological Quarterly* 53:20-28.  
  
1979 Small-scale fishermen's beliefs about success and development: A Puerto Rican case. *Human Organization* 38:6-11.
- Poggie, J., J. Bartee, and R. Pollnac  
1976 Psychocultural correlates of success among small-scale fishermen in western Puerto Rico. Paper delivered at the Annual Meeting of the Northeastern Anthropological Association. Middletown, Connecticut, March 1976.
- Pollnac, R.  
1979 Future orientation among the small-scale fishermen of the Northwest coast of Costa Rica. *Anthropology Working Paper No. 37*, University of Rhode Island.  
  
1976 Continuity and change in marine fishing communities. State-of-Art paper prepared for U.S.A.I.D. *Anthropology Working Paper No. 10*, University of Rhode Island.
- Streeten, P.  
1979 From growth to basic needs *Finance and Development* 16, No. 3:28-31.