AGENCY FOR INTERNATIONAL DEVELOPMENT
WASHINGTON, D. C 20523
BIBLIOGRAPHIC INPUT SHEET

FOR AID USE ONLY
Batch 78 ARDA

1. SUBJECT CLASSIFICATION

A. PRIMARY
Food production and nutrition — AE50-0000-G362

B. SECONDARY
Rural sociology--Panama

2. TITLE AND SUBTITLE
Panamanian small-scale fishermen; society,culture, and change

3. AUTHOR(S)
(100) Pollnac,R.B.; (101) R.I.Univ. Int.Ctr.for Marine Resource Development

4. DOCUMENT DATE	5. NUMBER OF PAGES	6. ARC NUMBER
1977	~~90p.~~ 91p.	ARC

7. REFERENCE ORGANIZATION NAME AND ADDRESS
R.I.

8. SUPPLEMENTARY NOTES (Sponsoring Organization, Publishers, Availability)
(In Marine technical rpt.no.44)

9. ABSTRACT

Reports on research done in Panama in 1975 which provided the sociocultural data necessary to develop a small-scale fishery. Much of the research focused on fishermen's attitudes and beliefs about cooperative organizations, since fishing cooperatives were to be used for development. Correlates of cooperative membership were also investigated to determine the effects of existing organizations. Relationships between kinship and the occupation of fishing and attitudes and values associated with the occupation were examined as a way to obtain information on how and why men are recruited to the occupation and why they do or do not remain. Economic gratification orientations and attitudes toward loans were examined. The Panamanian small-scale fisherman was found to have a relatively favorable attitude towards his occupation. Kinship was found to be a factor in both recruitment to the occupation and crew structure, and economic studies of the small-scale fishery should take this factor into consideration. There was a great variability in knowledge of the benefits and functions of cooperative organizations. It is suggested that the amount of variability concerning benefits and function of cooperative organizations could lead to problems in development and operation due to varying expectations on the part of participants. It is also recommended that educational programs should be developed to correct this problem. Formal education, as mediated by mass media exposure and knowledge about cooperatives, was positively related to cooperative/precooperative membership. The report presents additional information on the Panamanian small-scale fisherman, and it suggests elements which could have an impact on the ongoing development of the fishery.

10. CONTROL NUMBER
PN-AAF-272

11. PRICE OF DOCUMENT

12. DESCRIPTORS
Attitudes
Cooperatives
Cultural factor
Economic development
Fishermen
Organization theory
Panama
Social change
Social implications

13. PROJECT NUMBER

14. CONTRACT NUMBER
CSD-2455 211(d)

15. TYPE OF DOCUMENT

AID 590-1 (4-74)

Panamanian Small-Scale Fishermen:

Society, Culture, and Change

Richard B. Pollnac, Editor
Department of Sociology and Anthropology

Marine Technical Report No. 44
International Center for Marine Resource Development
University of Rhode Island Kingston, R.I. 1977

ICMRD

This research was supported by the Agency for International Development under Institutional Development Grant AID/csd 2455.

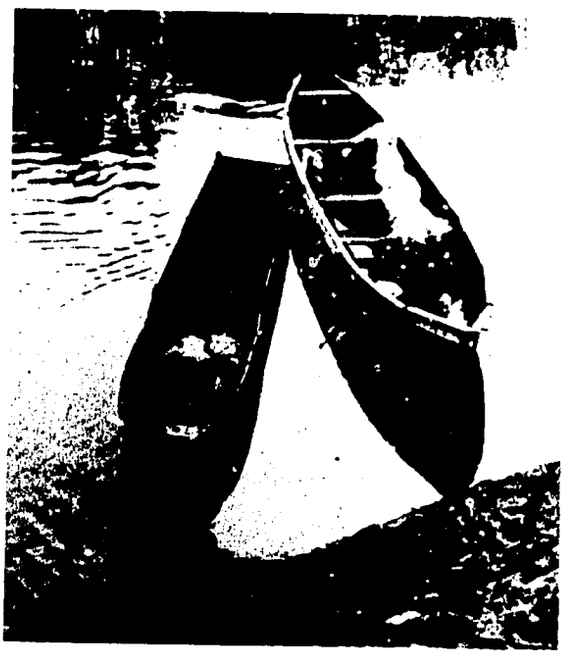
Additional copies may be obtained from the Marine Advisory Service, University of Rhode Island, Narragansett Bay Campus, Narragansett, Rhode Island 02882.

CONTENTS

LIST OF TABLES

LIST OF FIGURES

Boca Parita, Panama



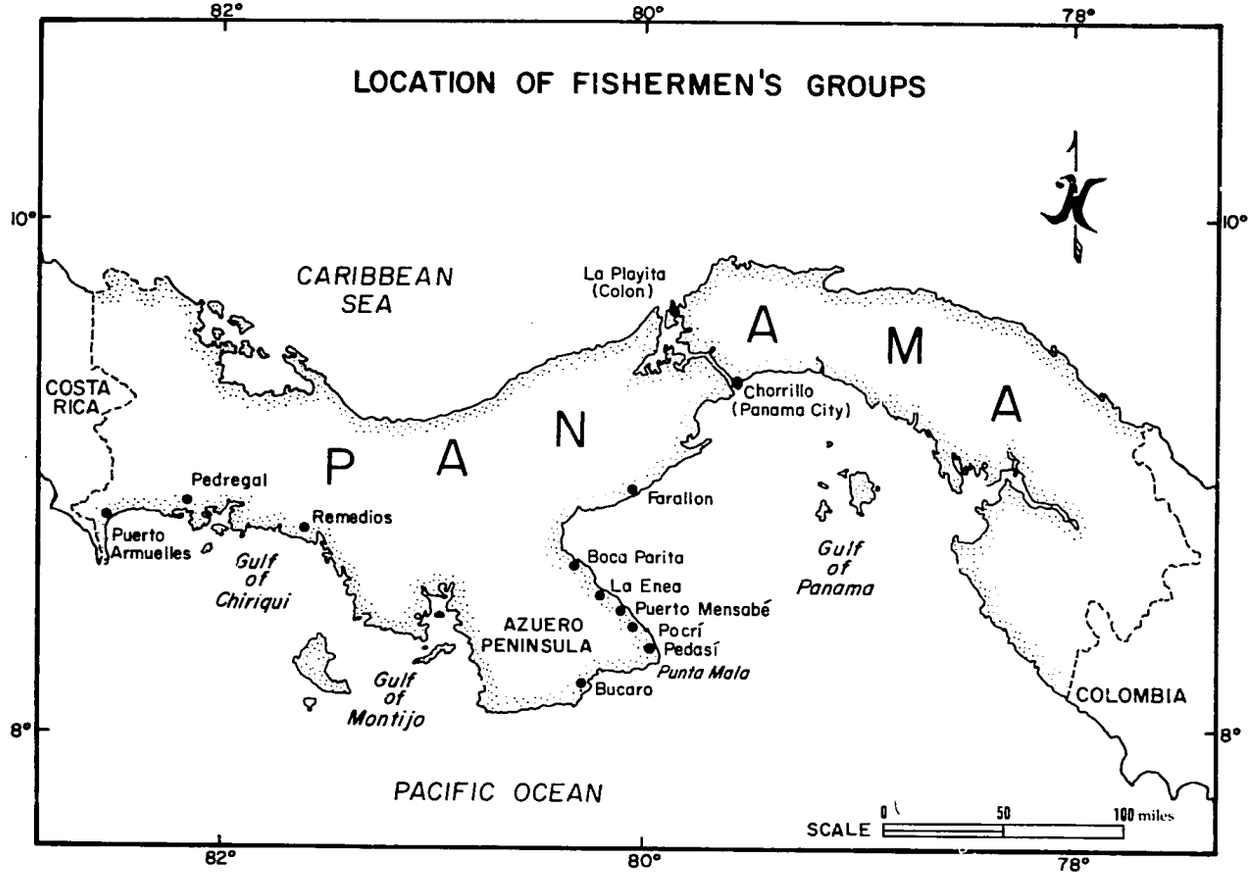

LOCATION OF FISHERMEN'S GROUPS
82°
80°
78°
10°
8°
CARIBBEAN SEA
PACIFIC OCEAN
COSTA RICA
PANAMA
COLOMBIA
La Playita (Colon)
Chorrillo (Panama City)
Farallon
Pedregal
Remedios
Puerto Armuelles
Gulf of Chiriqui
Gulf of Montijo
Gulf of Panama
AZUERO PENINSULA
Boca Parita
La Enea
Puerto Mensabé
Pocrí
Pedasí
Punta Mala
Bucaro
SCALE
0
50
100 miles

FIGURE 1

FOREWORD

In the past, achieving technological development and change was perceived as merely a technical problem. It was believed that the transfer of modern technology to a group of people would result in increased production and overall improvement of living conditions. Experience, however, has shown that technological development programs are frequently resisted for various reasons. Often, project success or failure can be attributed to socio-cultural factors (cf. Morss, et al 1976).

Plans to develop the small-scale fishery of the Republic of Panama include enlargement and modernization of both fleet and infrastructure. Development plans indicate that fishermen's cooperatives will provide the institutional structure for this development. Arellano-Lennox (1976), however, has noted that several obstacles stand in the path of proposed changes: (1) Fishing cooperatives must be better organized, and fishermen need to understand cooperative purposes in order to prevent exploitation by the organizations; (2) There is little full-time fishing tradition, and, to be effective, fishing must become a full-time occupation; and (3) The people may reject innovations imposed from the outside.

This report is the result of research conducted in Panama in 1975 aimed at providing sociocultural data necessary to facilitate development of the small-scale fishery. Since fishing cooperatives were to be the vehicle for development, much of the research focused on fishermen's attitudes and beliefs concerning cooperative organizations. This data can aid in both developing cooperative extension training programs and restructuring existing programs to fit the needs of the fishermen. Correlates of cooperative membership were also investigated to determine effects of existing organizations. Additionally, relationships between kinship and the occupation of fishing and attitudes and values associated with the occupation were examined as a means of obtaining information related to how and why men are recruited to the occupation and why they do or do not remain as fishermen. Finally, we examined economic gratification orientations and attitudes toward loans, two variables intimately connected with sustained economic development.

Preliminary versions of most sections of this report were made available to fishery personnel in Panama in 1975 and 1976 to aid in ongoing development of the small-scale fishery. It is hoped that this final report will be helpful in further advancing the noteworthy achievements already made in this sector of the Panamanian economy.

CHAPTER ONE

THE RESEARCH POPULATION: SMALL-SCALE FISHERMEN OF PANAMA

Richard B. Pollnac and Roberto Ruiz-Stout

Arellano-Lennox (1976) reports that 1,193 of Panama's estimated 2,500 fishermen are engaged in small-scale fishing, accounting for 0.24 percent of the economically productive population. This study focuses on a sample of 153 small-scale fishermen from seven major areas of Panama: (1) La Playita, Colon; (2) Chorrillo, Panama City; (3) Farallon; (4) The Azuero Peninsula; (5) Remedios; (6) Pedregal; and (7) Puerto Armuelles (see figure 1). A brief description of these areas is provided as a context for the studies presented in this report.

La Playita forms part of the city of Colon on the east bank of Bahia de Limon at the Caribbean entrance to the canal, 49 miles from Panama City. Colon is a modern port with a population of 67,695 and all the facilities one would expect in a modern city. The community of La Playita consists of small, usually one- or two-room houses constructed from scrap lumber. It is located on the beach and is composed, primarily, of descendants of people from the West Indies who emigrated to Panama to work on the canal. English is spoken in most homes, but many people are also fluent in Spanish. Sanitary facilities and water are centrally located and electricity is available. Mass media (radio, TV, newspapers, magazines, and cinema) are readily available in both English and Spanish. A railroad and a modern highway link Colon with Panama City.

The fishermen of La Playita are organized into a cooperative (Cooperativa de Pescadores de la Playita). They began to organize as a club of fishermen in 1943 and gradually developed into the present organization with little outside help. They attained full cooperative status in 1973. The cooperative operates out of several wooden buildings in La Playita: a fish shop, office, and meeting room. The fish shop is equipped with a scale, electric light, and ice chest. The cooperative owns several boats, motors, and nets which rotate among the fishermen. Fishing is conducted primarily with hand lines.

Chorrillo is located in the far southwest corner of Panama City (population 348,704) adjacent to the Canal Zone. Housing in this older area of Panama consists primarily of two-story wooden apartments with central toilet facilities. Electricity service is readily available and all mass media are present in both English and Spanish, with Spanish being the prevalent language. An extensive public transportation network connects Chorrillo with the rest of Panama City.

Some of the fishermen of Chorrillo are members of a fishermen's cooperative which was formed in 1965. The cooperative owns some equipment which is used by members who need it. It operates out of a substantial, cement block building located on the beach where the catch is landed. The cooperative building contains a selling location with running water, fish cleaning area, electricity, freezing plant, ice machine, cold rooms, and equipment storage rooms. A UNFAO drying machine is used to dry shark meat, which is packaged in plastic bags and distributed throughout Panama. Fishing is primarily done with hand lines or gill nets from wooden dugouts powered by outboard motors.

Farallon is located on the Gulf of Panama approximately 120km from Panama City. Local population concentrations include San Carlos (26km from Farallon, population 1,408), Rio Hato (2km, population 5,409), Anton (12km, population 5,321), and Penonome (29km, population 7,345). The community of Farallon consists primarily of fishermen, some personnel who work on the nearby National Guard Base, and weekend vacationers. Most fishermen live in small wooden houses constructed on pilings either on the beach or just over the dunes from the beach. Sanitary facilities are most frequently latrine pits separate from dwellings. Electricity and indoor plumbing are available, but most fishermen obtain water from centrally located stand pipes. Some fishermen grow food on small holdings adjacent to their houses, while others maintain agricultural plots outside the community. TV and radio stations can be received at Farallon. Newspapers and magazines are available, but are more difficult to obtain than in the urban areas. There is no cinema.

The fishermen of Farallon were at one time organized into a cooperative which failed due to organizational problems and was taken over by the government. The plant, presently operated by the government, provides some equipment for fishermen and markets their products. The plant has an ice machine, cooling rooms, fish cleaning tables, running water, a selling location, and several vehicles for product distribution. Fishing is done with either nets or handlines from outboard-motor-powered dugout or fiberglass boats.

The Azuero Peninsula extends southward into the Pacific Ocean between the gulfs of Montijo and Panama. Research in this area was conducted in three regions: (1) Boca Parita; (2) La Enea: and (3) Mensabe-south around Punta Mala to Bucaro. Boca Parita is a small fishing community located five kilometers from Chitre (population 12,379) and 251 kilometers from Panama City. Most houses are adobe or cement block with tin roofs. Electricity and water service are both available. Sanitation facilities are generally located outside the dwelling. Almost all fishermen from Boca Parita have small subsistence farms. All mass media are readily available in Chitre, which is easily reached by foot or public transportation.

The fishermen of Boca Parita are organized into a cooperative which has had organizational difficulties and was being run by the National Guard in March 1975. The cooperative owns some fishing equipment (boats, motors, gill nets), a substantial building with running water, electricity, cleaning tables, cold storage tanks, and a selling location. Fishing is generally done from dugout or fiberglass boats with handlines and nets. Corrals are also used at Boca Parita.

La Enea (population 532) is located approximately 24km south of Chitre and 1.5km from Guarare (population 1,138). The other major population center nearby is Las Tablas (6km, population 4,488). Most dwellings at La Enea are of cement block or adobe with tin or tile roofs. Both electricity and water service are available. Most fishermen also operate small farms, which produce most of their food. All fishermen have a source of income other than fishing because fishing is seasonal in this region. The primary alternative source of income is working in the salinas (salt evaporation ponds). TV and radio reception is good, but newspapers and magazines are more difficult to obtain than in Chitre. There is no cinema. Public transportation (bus and taxi service) is available.

The fishermen of La Enea are organized into a precooperative which possesses some fishing equipment (two boats, motors, and gill nets), a building in town and one at the landing site, cold storage chests, and electric service. Fishing is primarily conducted with handlines and nets.

Mensabe-south around Punta Mala to Bucaro is treated as a distinct area because of the nature of the fishing conducted. Areas where fish can be caught are highly seasonal, and fishermen move to locations where fish are available. Most fishermen maintain permanent residences in one of the small towns in the area, but some are truly migratory, moving the household to where the fish are. Those who keep a home in one of the small towns go to fish for one or two weeks, return to their families for a short period, and then return to fish. Both types of fishermen were interviewed, and those who maintained permanent town residences came from La Candalaria, Pocri, and Pedasi. The government owned and operated plant at Mensabe has boats, nets, and motors which are used by some of these fishermen. This plant also has cold storage facilities, an ice machine, and vehicles which are used to distribute fish. La Candalaria is a very small, primarily agricultural town. House types are generally adobe with tile roofs. Electricity is not available except at a small shop which has a generator. A water tower has been erected and sanitary water is available. All fishermen do some farming as well as fishing. Except for a TV set located at the shop with the generator, the only readily available mass medium is the radio. Public transportation in the form of a collective taxi connects La Candalaria with Las Tablas. Fishermen are not organized, and they fish using dugout canoes with motor or fiberglass boats from the government plant at Mensabe which is located just across the river. Pocri and Pedasi are both small towns respectively located 18 and 36 kilometers south of Las Tablas. House types are generally adobe with tile or tin roofs and running water and electricity are available. Fishermen usually plant small gardens in addition to their fishing activities. Readily available mass media are limited to TV and radio. It takes a special effort to obtain current newspapers and magazines, and there is no cinema in either town. Both towns are served by small busses and taxis. There are no fishermen's organizations and the fishermen use either privately owned dugouts with motor or motorized fiberglass boats from the government plant at Mensabe. Fishing is usually conducted with handlines. Lobster nets are also used.

Remedios is located just south of the Pan American Highway approximately 95km from David (population 36,089) and 110km from Santiago (population 21,896). Houses are generally constructed of adobe, cement block or cane.

Electricity and water services are available. Most fishermen also keep small farms. Radio and TV reception is good, but newspapers and periodicals require more effort to obtain than in larger population centers. There is no cinema in Remedios. Small busses provide public transportation linking Remedios with the rest of Panama. There is no fishermen's organization at Remedios at the present time, but a precooperative existed for a brief period in 1973-74. The few fishermen at this location fish with nets and handlines from fiberglass boats with outboard motors.

Pedregal (population 6,539) is located approximately 6 kilometers south of David on a river which empties into the north central part of the Gulf of Chiriqui. There is easy access to the Pan American Highway, which passes through David. The airport at David has regular service to Panama City. House types in Pedregal include cane thatch, wood, adobe, and cement block. Electricity and running water are available, but most fishermen obtain water from wells or stand pipes. Sanitary facilities are usually located outside the dwelling. All mass media are readily available in David. Fishermen at Pedregal are now formed into a precooperative which has almost no facilities. Fishing is conducted, for the most part, from outboard-motor-powered dugout canoes with handlines. Some nets are in use.

Puerto Armuelles is located at the northwest end of the Gulf of Chiriqui on the Pacific Coast, approximately 500 kilometers by paved road from Panama City. It functions as port and supply center for the banana plantations of this sector of Panama. Approximately 30,000 people associated with the banana plantations live within 30 kilometers of Puerto Armuelles. Puerto Armuelles is connected to the wage earners in the various banana fincas by a network of all-weather dirt roads, suggesting a potentially good market for fish products. In addition to the paved road which connects it to other sections of Panama, there is a 36-inch narrow gauge railroad system (Ferrocarril Nacional de Chiriqui) connecting David and Puerto Armuelles with spur lines to Potreillos, Pedregal, and San Andres. Additionally, Puerto Armuelles has an airport with daily flights to Panama City and a pier for banana boats. All mass media are readily available. Houses in Puerto Armuelles are mainly of wood. Electricity and running water are available. Both a fishermen's precooperative and a fishermen's corporation formed at an earlier date failed due to equipment failure and organizational difficulties. Most fishermen in Puerto Armuelles use handlines and dugout canoes without motors.

Summary Description of Samples

A summary description of the samples with respect to home ownership and selected household items can be found in table 1.1.

Table 1.1. Percent distribution of home ownership and selected household items.

	Chorrillo	La Playita	Pedregal	Boca Parita	Puerto Armuelles	La Enea	Mensabe and South	Farallon	Remedios
Own house	14	58	91	100	88	100	53	88	100
Water in house	79	11	9	100	13	--	18	64	--
Electricity	93	69	36	71	25	67	24	48	14
Radio	86	64	86	71	63	67	71	84	43
Television	79	42	9	29	6	33	18	32	--
Refrigerator	64	39	--	--	--	78	29	32	--
Sewing machine	29	25	36	14	38	56	24	24	--
Indoor toilet	86	11	--	--	19	--	6	20	--
N	14	36	22	7	16	9	17	25	7

Table 1.2 indicates the amount of variability between the samples with respect to mass media exposure and education. As will be noted later in this report, these variables have figured importantly in many studies of innovation and change (cf. Rogers and Shoemaker, 1971).

Table 1.2. Percent distribution of mass media exposure and education.

	Chorrillo	La Playita	Pedregal	Boca Parita	Puerto Armuelles	La Enea	Mensabe and South	Farallon	Remedios
Television									
≥1 per week	93	92	36	43	56	78	24	72	14
Radio									
≥1 per week	86	86	86	71	88	89	88	96	86
Newspaper									
≥1 per week	86	94	50	--	56	--	18	56	29
Magazine									
≥1 per week	71	47	55	29	44	44	24	24	14
Cinema									
≥1 per week	64	56	9	--	56	--	--	--	--
Education									
≥6 years	79	61	41	43	44	78	41	48	57
N	14	36	22	7	16	9	17	25	7

The distribution of gear and vessel type, boat ownership, and vessel size can be found in table 1.3.

Table 1.3. Percent distribution of boat ownership, fishing gear and vessel types.

	Chorrillo	La Playita	Pedregal	Boca Parita	Puerto Armuelles	La Enea	Mensabe and South	Farallon	Remedios
Own boat	7	58	36	14	44	11	29	20	14
Hook and line	93	97	50	71	100	78	100	4	100
Traps	--	--	--	14	--	--	--	--	--
Cast net	93	28	--	71	--	56	18	--	--
Monofilament gill net	21	39	41	43	--	100	76	84	--
Multifilament gill net	--	3	36	14	--	--	--	8	--
Beach net	--	3	23	--	--	--	--	8	--
Lobster net	14	--	--	--	--	--	12	8	--
Barrier net	--	--	18	--	--	--	--	--	14
Unmotorized vessel	--	28	32	43	88	--	--	16	--
Wood and fiber-glass vessel	50	--	--	--	--	--	--	--	--
Fiberglass vessel	7	--	9	--	--	--	65	20	100
Dugout vessel	29	97	91	71	100	100	35	80	--
Other or no vessel	14	3	--	29	--	--	--	--	--
Vessel size: 28-foot	17	3	16	20	--	25	65	50	50
Vessel size: 19 - 27-foot	75	56	37	40	38	25	24	45	50
Vessel size: 18-foot	8	41	47	40	62	50	12	5	--

As can be derived from the above discussion and tables, the various areas sampled differ on a wide range of variables. In other sections of this report we examine the effects this variance may have on socio-cultural variables, such as perceptions of cooperative organizations and economic gratification orientations, which are related to the development of the Panamanian small-scale fishing industry.

CHAPTER TWO

SMALL-SCALE FISHERMEN'S ATTITUDES TOWARD THE OCCUPATION OF FISHING IN THE REPUBLIC OF PANAMA

Richard B. Pollnac and Roberto Ruiz-Stout

Introduction

An important aspect of development and change among small-scale fishermen is fishermen's attitudes toward and perceptions of their occupation. An understanding of the attitudes, beliefs, and values associated with an individual's occupation may help explain resistance to change in some instances, and in others, it may facilitate development of programs to attract new members to the job force. This report examines small-scale fishermen's perceptions of the occupation of fishing in the Republic of Panama.

Positive Aspects of Fishing

Categories of responses to a question concerning aspects fishermen like most about fishing in comparison to other occupations can be found in Table 2.1.

Table 2.1. Distribution of responses reflecting positive aspects of the occupation of fishing.

Response Category	Frequency
1. Sport-pleasure	53
2. Monetary reward	47
3. Independence	25
4. Ease of work	5
5. Security	2
6. Do not know	7
7. Other	14

The most frequent response in table 2.1 refers to the pleasurable, gaming aspects of fishing. Fishing is compared to a sport. Individual fishermen emphasize the pleasurable aspects of being on the sea, in the fresh air, and the sporting aspect of struggling with fish. The next most frequent response concerns economic rewards. Fishermen note that they can make more money, in less time, than in any other occupation available to them. The third most frequent response category concerns the independent character of the fishing occupation. Fishermen report that they like being their own boss, free to work as they please, when they want to. Other response categories manifest relatively low frequencies.

The most frequent response categories to this question were examined in terms of their relationship to age, boat proprietorship, and formal education. It is first noted that there is a weak tendency for younger fishermen (those below the sample mean of 37.1 years) to respond that they like the occupation of fishing because it is like a sport ($x^2 = 3.654$, $p<.06$). This is in keeping with the impression that younger people are more adventuresome than older people.

A noteworthy finding is that boat owners are less likely to refer to the monetary reward of fishing than fishermen who do not own a boat ($x^2 = 5.823$, $p<.02$). This is somewhat surprising because the boat owner receives a greater monetary reward than a non-owner. The owner receives a full share of the catch for the use of his equipment. For example, if there are three fishermen in a boat the catch is divided into four shares, one of which goes to the owner. If the owner is also fishing from the boat, he receives two shares, or one-half the catch. The finding that non-boat owners are more likely to stress the monetary rewards of fishing than boat owners may reflect the relative salience of money to the two groups. Boat owners may have more confidence in the security of their income from fishing, thus the monetary reward, although important, would not be as salient as for non-boat owners. Conversely, we might note that boat owners have a significant amount of money tied up in their equipment and its maintenance and thus may not view their income as a large return on their investment.

Finally, there is a weak tendency for individuals who are more educated (above the sample mean of 5.1 years) to respond that they like the independence of the fishing occupation ($x^2 = 2.60$, $p<.10$).

Negative Aspects of Fishing

Categorized aspects of the occupation of fishing which are least liked by fishermen can be found in table 2.2.

Table 2.2. Distribution of responses reflecting negative aspects of fishing.

Response Category	Frequency
1. Nothing disliked	76
2. Exposure to elements	18
3. Lack, loss, or failure of equipment	15
4. Lack or loss of fish	14
5. Lack of bait	6
6. Low fish prices	4
7. Do not know	2
8. Other	18

As can be seen in table 2.2, most fishermen refuse to admit that there is anything they dislike about their occupation. The most frequently mentioned negative aspect is exposure to the elements: bad weather, rough seas, dampness, etc. Other frequent response categories include absence of either fish or equipment.

Categorized responses regarding negative aspects of fishing were examined in terms of respondent's age, boat proprietorship, and education. The only significant relationship found is that older fishermen (those over the sample mean of 37.1) are more likely to respond that there is nothing that they dislike about fishing than are younger fishermen ($x^2 = 6.973$, $p<.01$).

Attitudes Toward Son Becoming Fisherman

Another question reflecting attitudes toward the occupation of fishing concerns whether or not a fisherman would want his son to become a fisherman. Roughly one-half, or 49.6 percent, of the fishermen responded that they would like it if their son became a fisherman. This reflects a relatively positive attitude towards the occupation of fishing, but it is one which varies from community to community as can be seen in table 2.3.

Table 2.3. Distribution of fishermen who would like it if their son became a fisherman.

Community	Percent of Fishermen Who Would Like Son to Become a Fisherman
Panama City (Chorrillo)	21
Colon (La Playita)	53
Pedregal	50
Boca Parita	29
Puerto Armuelles	69
La Enea	44
Mensabe and South on Azuero Peninsula	60
Farallon	50
Remedios	71

The low percentage of fishermen in Panama City responding that they would like their son to become a fisherman probably reflects the relative abundance of alternative occupational opportunities in the city.

Other variables potentially related to a father's attitude toward his son becoming a fisherman were also examined. First, the hypothesis that individuals whose fathers were fishermen would be more likely to want their son to become a fisherman is not supported by the data ($x^2 = 0.129$, $p>.10$). Second, the hypothesis that individuals who own the means of production (e.g., boat owners) would be more favorable toward having their son follow in their footsteps is also rejected ($x^2 = 0.087$, $p>.10$). Finally, the hypothesis that individuals with more than the mean number of years of education ($\bar{x} = 5.1$) would be less likely to view fishing as a desirable occupation for their son is supported by the data ($x^2 = 2.71$, $p = 0.05$, one-tailed test).

Categorized rationales for both positive and negative responses to this question can be found in table 2.4.

Table 2.4. Distribution of primary rationales for attitude toward son's becoming a fisherman.

Rationale		Frequency
Positive:	Sport, exciting, distracting	6
Positive:	Income	10
Positive:	Take my place	22
Positive:	Independent	4
Negative:	Do something better	25
Negative:	Hard life	28
Negative:	Low income	4
Negative:	Dangerous, risky	6
Other:	Positive and negative	46

A large number of the responses are idiosyncratic, thus resulting in the large "Other" category. Turning to the categorized responses we find that the most frequent positive response refers to the idea that it is desirable for a son to follow in his father's footsteps. The next highest positive response category refers to the relatively high income of fishermen. This is of course balanced by those negative responses which refer to a fisherman's income as being inadequate. Turning to negative responses the most frequent refers to the hard life of the fisherman. Close behind this category in frequency is the desire for the son to do something better (e.g., be educated into a profession).

Summary

We find that in general the Panamanian small-scale fisherman has a rather positive attitude toward his occupation -- so positive that roughly one-half would like their sons to follow in their footsteps. Additionally, almost 50 percent could not find anything negative to say about fishing when asked what they disliked about the occupation. These positive attitudes are probably engendered by the "sporting" aspect of fishing which was mentioned by many fishermen. The relatively high monetary reward and the independent nature of fishing also contributes to the fisherman's high regard for his occupation.

Nevertheless, patterns of association between attitudes toward the occupation of fishing and other variables lead us to predict that this relatively positive image of the occupation may become more negative in the future. This prediction is based on findings reported above which suggest a tendency on the part of younger fishermen to be more critical of their occupation than older fishermen. If these attitudes are maintained by younger fishermen as they grow older, and if the upcoming generation of fishermen continue the tendency to be more critical of their occupation, we will find ourselves in a situation where the overall attitude toward fishing will become more negative. This prediction is also supported by the finding which indicates that the more education a fisherman has, the less likely he will be to perceive fishing as a desirable occupation for his son. If the situation which resulted in this finding continues, and if the educational level attained by the people of the Republic of Panama continues to rise as it has in the past, we would expect that fewer and fewer fishermen would

want their sons to become fishermen in the future. It is suggested that changes in the industry which would both reduce perceived negative aspects of fishing and enhance positive aspects could reverse this trend.

With respect to the present-day situation, however, we suggest that it would probably be difficult to convince many fishermen that an alternative occupation could be as rewarding unless the alternative rewards are presented in such a manner that they contrast favorably with the fisherman's perception of his present occupation. Additionally, changes in the fishery which fishermen perceive as being in conflict with positive aspects of small-scale fishing (e.g., a cooperative may be perceived as reducing a fisherman's degree of independence) will probably be resisted unless the proposed changes are introduced in such a manner that will either reduce or eliminate perceived conflict.

In sum, we have examined small-scale fishermen's attitudes toward the occupation of fishing and have suggested how this information can be used in applied situations.

CHAPTER THREE

KINSHIP LINKS AMONG SMALL-SCALE FISHERMEN IN THE REPUBLIC OF PANAMA

Richard B. Pollnac and Roberto Ruiz-Stout

Introduction

When changes are proposed at the productive level of any sector of the economy it is important to understand existing social relations between individual workers at the level involved. Work groups with which individuals are personally identified provide a degree of psychological security and satisfaction, and innovations perceived as threatening the structure of these groups often meet resistance (Foster, 1973). Among small-scale fishermen, changes in the nature or size of technology can result in drastic changes in work group composition (cf. Fraser, 1966; Pollnac, 1976). Additionally, changes restricting access to resources can result in denial of access to some group members who would normally enter the occupation (Gersuny and Poggie, 1973). These individuals would be dispossessed of what they normally considered a right, and resistance to the new regulations would probably develop. Finally, development of new organizational forms such as fishermen's cooperatives might be facilitated by making use of existing social structures such as kinship groups. It is reported that cooperatives using existing kinship structures and local leadership in operations obtain more positive results than others (UNRISD, 1975). An understanding of these potential problems will facilitate development of policy and plans which will minimize social dislocations and increase the probability that proposed changes will succeed.

Kinship plays an important and varied role in the structure of the occupation of fishing in many parts of the world. The importance of kinship in fishermen's work groups has been extensively cited in the literature from regions as widely separated as Ghana (Quinn, 1971), Peru (Sabella, 1974), Micronesia (Knudson, 1970), the Faroe Islands (Blehr, 1963), Ulithi (Lessa, 1966), Costa Rica (Pollnac, 1977), and the West Indies (Aronoff, 1967). The need for harmony on a vessel is essential for success at sea, and the kinship ties may enhance cooperativeness within the work group. Other factors may also increase the tendency toward kin based crews. For example, Gladwin (1970) notes that among the Mfante of Ghana, boat crews with family cores are more stable than non-kin linked crews. On Moala kinship ties are related to the sharing and loaning of capital equipment such as boats (Sahlins, 1962), while on Tikopia canoes are nominally owned by heads of kin groups, but actually by the kin group as a whole (Firth, 1965). Sabella (1974) suggests that the use of kin in the crew among small-scale fishermen from Peru is often related to keeping boat production within the family.

Among some fishing people, however, we find that kinship plays little or no role in crew composition. Glacken (1955) notes that family members fish from different vessels on Okinawa. This is done to minimize loss to individual families if a fatal accident occurs. Further, neither Taiwanese (Diamond, 1969) nor Malay (Firth, 1966) fishing crews are primarily based on kin ties. Norr (1972) reports a similar situation in South India and suggests that the skilled nature of the occupation of fishing results in worker recruitment on the basis of skill and interpersonal ability rather than social ties.

It also appears that recruitment to the occupation of fishing takes place along kinship lines in many societies. For example, in societies cited above wherein crew composition is based on kinship links, kinship doubtless plays a role in recruitment. Data from the Atlantic Coast of North America also indicates a great deal of kinship ties between fishermen (Liguori, 1968; Proskie and Adams, 1969; Gersuny and Poggie, 1973).

In this paper, kinship links between small-scale fishermen in the Republic of Panama will be examined. Specifically, the paper provides a description of the role of kinship in crew structure and recruitment to the industry. The paper also examines variance in the role of kinship among different age and residential groups.

Analysis

Turning first to the relationship between kinship and crew membership, we find that 61 percent of the fishermen interviewed do not fish with family members. Twenty-five percent have one family member in the crew, and 14 percent have two or more. It appears that there is less of a tendency for fishermen in the urban areas (Colon and Panama City) to fish with kinsmen than in the more rural areas (12 versus 52 percent respectively; $x^2 = 23.08$, $p<.001$). There is no significant difference between older (40 years or older) and younger fishermen with regard to kinship involvement in crew (44 versus 31 percent respectively; $x^2 = 2.62$, $p>.05$).

Only 31 percent of the fishermen interviewed have no other kinsmen who fish. Twenty-two percent have at least one kinsman who fishes and 47 percent have two or more. Once again we find rural-urban differences. Forty-eight percent of the urban (Panama City and Colon) fishermen have kinsmen who fish in contrast to 79 percent of the rural. This difference is statistically significant ($x^2 = 14.68$, $p<.001$). There is no significant difference between older (40 years or more) and younger fishermen with regard to percentage having kinsmen who fish (16 versus 26 percent respectively; $x^2 = 2.43$, $p>.05$).

Turning to occupational succession, we find that only 21 percent of the fishermen interviewed report their father's occupation as fisherman. Most (35 percent) replied that their father's occupation was farming, while the next most frequent response, longshoreman, was reported by only seven percent of the fishermen. There is no difference between the rural and urban areas with respect to percentage of fisherman fathers. Further, there is no significant difference between older (40 years or more) and

younger fishermen with regard to percentage of fisherman fathers (16 versus 23 percent respectively; $x^2 = 1.30$, $p > .05$). Finally, as noted in the previous chapter, approximately one-half of the fishermen interviewed would like it if their sons became fishermen. Kin involvement in fishing seems to have no effect on this attitude. Residence in Panama City and years of formal education, however, seem to be inversely related to a positive attitude towards one's son becoming a fisherman (see previous chapter).

Discussion

Overall, kinship appears to play a moderately important role among small-scale fishermen in the Republic of Panama. The large number of fishermen who have relatives who fish clearly indicates the salience of kinship links in this occupation. For the most part, these kin links are more important in the rural areas than in the urban.

These interrelationships between kinship and small-scale fishing in the Republic of Panama have several implications for research and development in this sector of the economy: (1) Changes in technology which would affect work group structure (i.e., by creating highly specialized jobs or radically increasing or decreasing crew size) should be examined to determine the effect they would have on the role of kinship in crew structure. Attitudes toward these potential effects should be investigated, and, if necessary, proposed changes should be adjusted to desired work group structure. (2) Changes such as limiting entry to the occupation need to be more carefully conducted in areas where occupational succession follows kinship lines. Alternative occupational opportunities need to be provided to take the place of the occupation that individuals had normally considered their birthright. To be most successful, these alternative occupational opportunities should provide the same degree of satisfaction as small-scale fishing. As a means of achieving this goal, we need to understand the fishermen's perceptions of his occupation in comparison with other occupations -- a subject investigated in the preceeding chapter. (3) Finally, economic studies involving fishermen's income should account for the degree of kinship involvement in crew structure. Individual income may appear to be low in some cases, but if kinship involvement is high and if proceeds of the catch are pooled for household use, household income may be higher than individual income would suggest.

In sum, we have examined the extent of kinship involvement in small-scale fishing in the Republic of Panama, and have found that is is relatively more extensive in the rural than in the urban area. Implications of kinship links in crew structure and occupational succession were discussed and considered of sufficient importance to warrent their consideration in any program of planned change which would affect the structure or recruitment of work groups among these small-scale fishermen.

CHAPTER FOUR

PERCEPTIONS OF FISHERMEN'S COOPERATIVES BY SMALL-SCALE FISHERMEN IN THE REPUBLIC OF PANAMA

Richard B. Pollnac and Roberto Ruiz-Stout

Introduction

Many governments, international organizations, and individuals view the fishermen's cooperative as the ideal means of improving small-scale fisheries. In some cases, marked success has been reported (FAO, 1971) and in others, failure (UNRISD, 1975). The successes have led many governmental and international aid organizations to make release of development funds contingent upon formation of fishermen's cooperatives for management purposes. This has led to increased pressure, in many instances, with regard to attempts to institute cooperative organizations. In many instances this type of organization is novel and can be regarded as an innovation. The institution of fishermen's cooperatives in these circumstances can thus be conceptualized as a problem dealing with the diffusion of an innovation, and with regard to an innovation's acceptance, Rogers and Shoemaker write that "it is the attributes of a new product, not as seen by the experts but as perceived by the potential adopters, that really matters." Foster (1973:130) puts it more succinctly when he writes:

> When people are confronted with new opportunities, acceptance or rejection depends not only upon the basic cultural articulation, a favorable pattern of social relations, and economic possibility, but also upon psychological factors. How does the novelty appear to the individual? That is, how does he perceive it? Does he see it in the same light as the technical specialist who presents it to him? Does it convey the same message?

Further, Levine (1973:146-147) provides a theoretical discussion of how cultural material is cognitively transformed when it is introduced into a group from the outside. It is therefore important to determine how the individual fisherman perceives a fishermen's cooperative organization.

An awareness of these perceptions is important for several reasons. First, it helps us understand fishermen's attitudes concerning cooperatives. Second, it facilitates recognition of potential problem areas resulting from misconceptions of the real effects of cooperatives. And third, it aids in developing information programs which will result in more realistic perceptions of the effects of fishermen's cooperatives, thus enhancing their chances of success.

This paper describes fishermen's perceptions of fishermen's cooperative organizations in the Republic of Panama. These perceptions are examined in relationship to other sociocultural variables to determine their interrelationships in an attempt to account for variability in the conceptualization of this type of organization. Results are examined and suggestions made concerning possible action to improve problem areas.

Methods

Sample. The sample consists of 153 small-scale fishermen from the Republic of Panama. Fishermen were interviewed in a wide range of locations extending from Colon on the Atlantic coast to Panama City on the Pacific, and at numerous locations along the Pacific coast from Panama City to the Costa Rican border (see figure 1). Several of the locations had operative cooperative or precooperative organizations (La Playita, Chorrillo, Boca Parita, La Enea, Pedregal), and at some, fishermen's organizations had failed (Puerto Armuelles, Remedios, Farallon). Forty-eight percent of the sample were either cooperative or precooperative members.

Tests. Perception of fishermen's cooperative organizations was determined from a content analysis of the responses to the following three open-ended questions:

(1) What are the benefits of belonging to a fishermen's cooperative?

(2) What is a fishermen's cooperative supposed to do?

(3) What would you do if you were president of a fishermen's cooperative?

Background sociocultural information (e.g., age, formal education) was determined from responses to direct questions. At La Playita questions were posed in either Spanish or English depending upon which language the respondent was most familiar with. In all other areas questions were posed in Spanish.

Analysis

Perceived Benefits of Cooperative Membership. One important facet of an individual's understanding of a cooperative concerns perceptions of benefits of cooperative membership. This variable was investigated by requesting individual fishermen to list the benefits of belonging to a fishermen's cooperative. Responses to this open-ended question were coded and tabulated for all respondents, and the results can be found in table 4.1.

Table 4.1. Perceived benefits of cooperative membership.

Response Category	Frequency Response 1	Response 2	Response 3
1. Facilitates marketing	22	2	3
2. Social benefits	21	9	1
3. Source of equipment and supplies	17	6	1
4. Facilitates cooperation among members	9	4	1
5. Availability of funds, loans, etc.	7	7	1
6. Facilitates obtaining government help	1	1	2
7. No benefits	5	-	-
8. Other	12	3	1
9. Do not know	59	-	-
Total	153		

As can be seen in table 4.1 some individuals provide more than one response. Turning to the first response category, which can be considered the most salient since it is the first to come to mind, we find that the most frequent response (39 percent) is "do not know." Since one of the goals is development of small-scale fisheries through establishment of fishermen's cooperatives, it is important to determine the sociocultural characteristics of individuals who do not understand the benefits of cooperative membership.

First, we find that it is primarily individuals who do not belong to a cooperative or precooperative who respond that they do not know the benefits of cooperative membership. Only 12 percent of cooperative or precooperative members respond "do not know" as contrasted with 63 percent of the non-members ($x^2 = 40.554$, $\phi = .514$, $p<.001$). Age also appears to be related to knowledge about benefits of belonging to a cooperative. Forty-five percent of the fishermen less than 40 years of age respond that they do not know the benefits of cooperative membership in contrast to only 28 percent of those 40 years or older ($x^2 = 4.749$, $\phi = .176$, $p<.05$). Interestingly enough, formal education seems to have little to do with knowledge of benefits of cooperative membership. A slightly greater percentage of those fishermen who have had less than the mean number of years of formal education ($\bar{x} = 5.1$) responds "do not know" than do those exceeding the mean (44 percent versus 34 percent respectively; $x^2 = 1.454$, $\phi = .094$, $p>.20$). Number of years fishing, however, is strongly related to knowledge of benefits derived from cooperative membership. Fifty-four percent of the fishermen who had been fishing less than the sample mean ($\bar{x} = 16.8$ years) respond "do not know" in contrast to only 16 percent of those exceeding the mean ($x^2 = 22.271$, $\phi = .389$, $p<.001$).

Turning to other perceived benefits of belonging to a cooperative, we find that marketing, social benefits, and provision of equipment and supplies are referred to with the greatest frequency. The marketing category in-

cludes responses which refer to marketing facilities or obtaining better prices for fish. The social benefits category is composed of responses which reflect a perceived social benefit (e.g., help when sick, better future for self and children). The other categories are self-explanatory.

Table 4.2 presents frequencies of response categories for cooperative/precooperative members and non-members. Responses cross-tabulated in table 4.2 are the first, most salient responses.

Table 4.2. Perceived benefits of cooperative membership cross-tabulated with cooperative/precooperative membership.

Response Category	Cooperative/Precooperative Member	Non-member
Facilitates marketing	19	3
Social benefits	13	8
Source of equipment and supplies	8	9
Facilitates cooperation among members	4	5
Availability of funds, loans, etc.	7	-
Facilitates obtaining government help	-	1
No benefits	5	-
Other	8	4
Do not know	9	50
Total	73	80

It is interesting to note, that of the high frequency categories, marketing is mentioned more frequently as a benefit by cooperative/precooperative members than by non-members ($x^2 = 15.386$, $\phi = .316$, $p<.001$). This suggests that non-members are not aware of this as one of the important functions that can be performed by a fishermen's cooperative. The difference in response frequencies for the social benefit and equipment/supplies categories are not statistically significant. Other response categories are of relatively low frequency and need not be discussed in terms of statistical significance. The "do not know" category is discussed above. It is interesting to note, however, that only cooperative/precooperative members say that membership in a cooperative provides no benefits.

Response categories cross tabulated with age divided at 40 years can be found in table 4.3. As can be seen in table 4.3, age is significantly related to only one of the high frequency response categories other than "do not know": perceived social benefits ($x^2 = 8.552$, $\phi = .234$, $p<.01$). It appears that older fishermen are more aware of the social benefits of cooperative membership than younger fishermen. Age has no significant effect on response frequencies for the equipment and supplies and marketing categories (chi square equals 1.679 and 1.596 respectively indicating that the probability that the response distributions could have occurred by chance exceeds .10).

Table 4.3. Perceived benefits of cooperative membership cross-tabulated with age.

Response Category	Age Less than 40	Age 40 or Older
Facilitates marketing	11	11
Social benefits	7	14
Source of equipment and supplies	13	4
Facilitates cooperation among members	6	3
Availability of funds, loans, etc.	5	2
Facilitates obtaining government help	-	1
No benefits	2	3
Other	8	4
Do not know	43	16
Total	95	58

Table 4.4 includes response categories cross-tabulated with formal education divided at six years. None of the three highest frequency response categories (marketing, social benefits, equipment/supplies) manifest statistically different response patterns with respect to formal education of respondent. We thus conclude that formal education has little to do with perception of benefits derived from participation in fishermen's cooperatives.

Table 4.4. Perceived benefits of cooperative membership cross-tabulated with education.

Response Category	Formal Education* Less than 6	6 or More	x^2	p
Facilitates marketing	8	14	1.041	>0.30
Social benefits	9	12	0.123	>0.70
Source of equipment and supplies	9	8	0.328	>0.50
Facilitates cooperation among members	2	7		
Availability of funds, loans, etc.	4	3		
Facilitates obtaining government help	-	1		
No benefits	3	2		
Other	5	7		
Do not know	31	28		
Total	71	82		

*Divided at sample mean ($\bar{x} = 5.1$).

Finally, turning to number of years fishing, we find that none of the three highest frequency response categories seem to be related to this variable (see table 4.5). The "do not know" response, which is inversely related to number of years fishing, is discussed above.

Table 4.5. Perceived benefits of cooperative membership cross-tabulated with number of years fishing.

Response Category	Years Fishing* Less than 17	17 or More	x^2	p
Facilitates marketing	10	12	1.896	>0.10
Social benefits	9	12	2.561	>0.10
Source of equipment and supplies	8	9	1.092	>0.20
Facilitates cooperation among members	3	6		
Availability of funds, loans, etc.	2	5		
Facilitates obtaining government help	1	-		
No benefits	2	3		
Other	6	6		
Do not know	49	10		
Total	90	63		

*Divided at sample mean ($\bar{x}$ = 16.8).

Conceptualization of a Cooperative's Function. Turning to another facet of an individual's conceptualization of a fishermen's cooperative, we next examine conceptualized function. This differs somewhat from perceived benefits in that it is concerned with what the fisherman thinks a cooperative is supposed to accomplish. It will, of course, overlap with perceived benefits, but the differences will provide us with a more complete picture of the fisherman's conceptualization of a cooperative organization.

The fishermen's conceptualization of the function of a cooperative was investigated by asking individual fishermen the open-ended question, "What is a fishermen's cooperative supposed to do?" Frequencies of the categorized responses to this question can be found in table 4.6.

Table 4.6. Fishermen's concepts of the function of a cooperative.

Response Category	Frequency		
	Response 1	Response 2	Response 3
Provide equipment and supplies	34	16	5
Help in all areas	32	3	-
Facilitate cooperation	14	5	1
Provide administration	9	2	-
Aid in marketing	8	9	1
Provide source for funds	8	6	1
Educate members	2	4	1
Other	14	7	3
Do not know	32	-	-
Total	153		

Table 4.6 indicates that the most frequent response to this question involves reference to provision of equipment or supplies. Fifty-five fishermen made reference to this function in their answers. The next most frequent response category is very general. Fishermen simply note that a cooperative is supposed to help them in all areas. "Do not know" is once again a high frequency category, but not as high as for the question concerning benefits of a cooperative. Another high frequency response refers to the idea that a cooperative is supposed to facilitate cooperation. The other response categories manifest relatively low frequencies, but it is interesting to note that functions such as providing administration and education of members are not mentioned among the fishermen's perceptions of the benefits of a cooperative. This question has thus broadened our understanding of the fishermen's conceptualization of a cooperative.

The primary response categories were cross-tabulated with cooperative/precooperative membership, age, number of years fishing, and formal education. Chi square was calculated for high frequency response categories.[1] The results of this analysis can be found in tables 4.7 through 4.10.

[1]Here high frequency response category refers to a category which was mentioned by at least 10 percent of the sample as either a first, second or third response. Primary response refers to the first, most salient response.

Table 4.7. Concepts of cooperative function cross-tabulated with age.

Response Category	Age		x^2	p
	Less than 40	40 or More		
Provide equipment and supplies	21	13	0.001	>0.90
Help in all areas	17	15	1.382	>0.20
Facilitate cooperation	6	8	2.422	>0.10
Provide administration	8	1		
Aid in marketing	7	1		
Provide source for funds	4	4		
Educate members	2	-		
Other	9	5		
Do not know	21	11	0.214	>0.50
Total	95	58		

Table 4.8. Concepts of cooperative function cross-tabulated with years fishing.

Response Category	Years Fishing*		x^2	p
	Less than 17	17 or More		
Provide equipment and supplies	19	15	0.156	>0.50
Help in all areas	15	17	2.384	>0.10
Facilitate cooperation	5	9	3.397	<0.10
Provide administration	5	4		
Aid in marketing	6	2		
Provide source for funds	4	4		
Educate members	2	-		
Other	7	7		
Do not know	27	5	10.906	<0.001
Total	90	63		

*Divided at sample mean ($\bar{x}$ = 16.8).

Table 4.9. Concepts of cooperative function cross-tabulated with cooperative/precooperative membership.

Response Category	Cooperative/Precooperative		x^2	p
	Member	Non-member		
Provide equipment and supplies	13	21	1.573	>0.10
Help in all areas	21	11	5.204	<0.05
Facilitate cooperation	11	3	5.882	<0.02
Provide administration	3	6		
Aid in marketing	5	3		
Provide source for funds	5	3		
Educate members	2	-		
Other	9	5		
Do not know	4	28	20.110	<0.001
Total	73	80		

Table 4.10. Concepts of cooperative function cross-tabulated with formal education.

Response Category	Formal Education* Less than 6	6 or More	x^2	p
Provide equipment and supplies	17	17	0.227	>0.50
Help in all areas	11	21	2.354	>0.10
Facilitate cooperation	9	5	1.980	>0.10
Provide administration	5	4		
Aid in marketing	3	5		
Provide source for funds	2	6		
Educate members	1	1		
Other	6	8		
Do not know	17	15	0.734	>0.30
Total	71	82		

*Divided at sample mean ($\bar{x}$ = 5.1).

As can be seen in tables 4.7 and 4.10, neither age nor formal education is significantly related to conceptualization of cooperative function. Years fishing and cooperative/precooperative membership are, however, related to some response categories. Tables 4.8 and 4.9 indicate that individuals who do not know the function of a cooperative are more likely to have fished for less than 17 years (sample mean equals 16.8 years) and not be a member of a cooperative or precooperative. There is also a statistically significant tendency for cooperative/precooperative members and individuals who have fished for more than 17 years to respond that the function of a cooperative is to facilitate cooperation among members. Finally, members are more likely than non-members to provide the general response that the function of a cooperative is to help in all areas.

Projected Actions of Individual Fishermen Hypothetically Placed in Charge of a Fishermen's Cooperative. The previous two sections examined individual fishermen's knowledge concerning benefits and functions of a cooperative organization. In this section we turn to an analysis of what the individual fisherman would do if he were in charge of a cooperative. Here the fisherman is requested to imagine himself in a position wherein he could control the operation of a cooperative. The information derived from this analysis thus provides an insight into both the functions and the benefits that individual fishermen would like to see associated with a cooperative. This contrasts with the previous two sections, which were primarily concerned with an individual's information concerning cooperative organizations. Here the fisherman can go beyond received knowledge and suggest techniques for making the organization more useful in his specific environment. This information is derived from a question which requested the fishermen to tell us what he would do if he were president of a fishermen's cooperative. Responses to this question were categorized, and the response categories can be found in table 4.11.

Table 4.11. Projected action of individual fishermen hypothetically placed in charge of a fishermen's cooperative.

Response Category	Frequency		
	Response 1	Response 2	Response 3
Provide equipment	39	19	6
Provide adequate administration	21	3	1
Obtain funds	17	7	2
Improve marketing and processing	16	8	4
Foment cooperation among members	8	4	2
Provide equipment maintenance	3	3	-
Educate members	2	-	1
Other	23	8	3
Do not know	24	-	-
Total	153		

Table 4.11 clearly indicates that many of the fishermen interviewed would like to see the cooperative provide more and better equipment. Provision of adequate administration was mentioned by a fair number of fishermen, suggesting that they view proper administration as an important facet of operating a cooperative. Obtaining funds and improvement of marketing and processing are next highest in frequency and reflect an ongoing concern of small-scale fishermen. Once again, the "do not know" category is relatively large.

Primary response categories are again cross-tabulated with cooperative/precooperative membership, age, number of years fishing, and formal education. High frequency response categories are examined for differential distributions across these variables using the chi square test of statistical significance. The results of this analysis can be found in tables 4.12 through 4.15.

Table 4.12. Projected action of individual fishermen hypothetically placed in charge of a fishermen's cooperative cross-tabulated with age.

Response Category	Age		x^2	p
	Less than 40	40 or More		
Provide equipment	21	18	1.511	>0.20
Provide adequate administration	16	5	2.055	>0.10
Obtain funds	8	9	1.836	>0.10
Improve marketing and processing	9	7	0.259	>0.50
Foment cooperation among members	5	3		
Provide equipment maintenance	3	-		
Educate members	2	-		
Other	13	10		
Do not know	18	6	2.015	>0.10
Total	95	58		

Table 4.13. Projected action of individual fishermen hypothetically placed in charge of a fishermen's cooperative cross-tabulated with number of years fishing.

Response Category	Years Fishing* Less than 17	17 or More	x^2	p
Provide equipment	21	18	0.535	>0.30
Provide adequate information	15	6	1.596	>0.20
Obtain funds	8	9	1.092	>0.20
Improve marketing and processing	9	7	0.048	>0.80
Foment cooperation among members	4	4		
Provide equipment maintenance	2	1		
Educate members	1	1		
Other	12	11		
Do not know	18	6	3.075	<0.10
Total	90	63		

*Divided at sample mean ($\bar{x}$ = 16.8).

Table 4.14. Projected action of individual fishermen hypothetically placed in charge of a fishermen's cooperative cross-tabulated with cooperative/precooperative membership.

Response Category	Cooperative/Precooperative Member	Non-member	x^2	p
Provide equipment	16	23	0.938	>0.30
Provide adequate administration	4	17	8.016	<0.01
Obtain funds	13	4	6.340	<0.02
Improve marketing and processing	12	4	5.333	<0.05
Foment cooperation among members	3	5		
Provide equipment maintenance	1	2		
Educate members	1	1		
Other	16	7		
Do not know	7	17	3.924	<0.05
Total	73	80		

Table 4.15. Projected action of individual fishermen hypothetically placed in charge of a fishermen's cooperative cross-tabulated with formal education.

Response Category	Formal Education* Less than 6	6 or More	x^2	p
Provide equipment	21	18	1.165	>0.20
Provide adequate administration	13	8	2.351	>0.10
Obtain funds	8	9	0.003	>0.95
Improve marketing and processing	5	11	1.650	>0.10
Foment cooperation among members	3	5		
Provide equipment maintenance	1	2		
Educate members	1	1		
Other	9	14		
Do not know	10	14	0.256	>0.50
Total	71	82		

*Divided at sample mean ($\bar{x}$ = 5.1).

Once again, as can be seen in tables 4.12 and 4.15, neither age nor formal education is significantly related to projected action of fishermen hypothetically placed in charge of a fishermen's cooperative. Further, years of fishing is only weakly related to the "do not know" response category. It appears, however, that membership in a cooperative or precooperative significantly affects answers to this question. Table 4.14 indicates that cooperative/precooperative members are less likely to refer to adequate administration in their first response. Additionally, cooperative/precooperative members are more likely to note that if they were president of a fishermen's cooperative they would obtain funds and improve marketing and processing. Finally, cooperative/precooperative members are less likely to respond that they do not know what they would do if they were president of a fishermen's cooperative.

Sociocultural Correlates of Lack of Knowledge about Fishermen's Cooperative Organizations. In this final section of the analysis we examine the interrelationships between professed lack of knowledge about fishermen's cooperative organizations and other sociocultural variables. Lack of knowledge is determined from responses to the three questions discussed above. Individuals are assigned scores of one for each of the questions to which they respond "do not know." These scores are summed resulting in a dependent variable ranging from zero to three, with three denoting the highest degree of lack of knowledge about fishermen's cooperatives. The independent variables were measured by responses to direct questions. These variables include the following: (1) age, (2) number of years fishing, (3) cooperative/precooperative member, (4) number of years in cooperative/precooperative, (5) past but not present cooperative/precooperative membership, (6) formal education, (7) number of times per week watch television, (8) number of times per week listen to radio, (9) number of times per week read newspaper. The interrelationships between the independent and dependent variables can be found in table 4.16.

Table 4.16 indicates that six of the nine independent variables are significantly related to the dependent variable -- five of them at better than the 0.01 level. The two variables with the highest correlations concern cooperative/precooperative membership. As would be expected there is an inverse relationship between cooperative/precooperative membership and lack of knowledge about a fishermen's cooperative. It follows that amount of time spent as a cooperative member would also be negatively related to lack of knowledge about cooperative organizations, and table 4.16 indicates that this is so.

It appears that age and number of years fishing are also inversely related to the dependent variable. This suggests that those who have lived or fished longer have had a greater chance to obtain information concerning cooperatives. Finally, two of the mass media exposure variables are inversely related to lack of knowledge about fishermen's cooperatives: television watching and newspaper reading. The correlation with the television variable is relatively weak, but statistically significant. The correlation between the dependent variable and newspaper reading, however, is quite respectable. Apparently, individuals who watch television frequently, and to a greater extent, those who frequently read newspapers,

Table 4.16. Interrelationships between lack of knowledge concerning fishermen's cooperative organizations and other sociocultural variables.

	1	2	3	4	5	6	7	8	9	10
1. Age (years)	1.00	0.67	0.32	0.40	-0.10	-0.26	0.14	-0.07	0.13	-0.25
2. Number of years fishing		1.00	0.25	0.43	0.06	-0.18	0.03	0.05	0.15	-0.36
3. Cooperative/Precooperative member			1.00	0.71	-0.44	0.05	0.15	-0.11	0.15	-0.48
4. Years in cooperative/precooperative				1.00	-0.31	0.02	0.16	-0.09	0.25	-0.42
5. Past but not present cooperative member					1.00	0.08	-0.12	0.10	-0.01	-0.01
6. Formal education						1.00	-0.17	-0.01	0.42	-0.15
7. Times per week watch television							1.00	-0.15	0.16	-0.16
8. Times per week listen to radio								1.00	-0.04	0.07
9. Times per week read newspaper									1.00	-0.35
10. Lack of knowledge about fishermen's cooperative organizations (scale)										1.00

N = 153. If $r \geq |0.16|$ $p<0.05$; if $r \geq |0.21|$ $p<0.01$.

are more likely to possess knowledge of fishermen's cooperative organizations. There are two possible interpretations of this finding: Either some information concerning cooperatives is derived from television and newspapers, or individuals who are inquisitive enough to read newspapers and watch television are more likely to search out information on cooperatives. This finding does, however, converge with other research which indicates that mass media exposure is strongly related to innovative behavior (Rogers, 1969; Rogers and Shoemaker, 1971).

Finally, a stepwise multiple regression analysis was conducted to determine the interrelationships between the dependent variable and all the independent variables. In the analysis presented here, the first variable entered is the one which explains the most variance in the dependent variable; the next entered is the one which explains the most with the first controlled. This stepwise procedure is continued until the increase in amount of variance explained decreases to less than a previously set level. In this analysis we cease entering variables when the increase in amount of variance explained falls to less than one percent. The results of this analysis can be found in table 4.17.

Table 4.17. Stepwise multiple regression of sociocultural variables with lack of knowledge concerning fishermen's cooperative organizations.

Step Number	Variable Entered	Multiple R	R^2	F Ratio	D.F.		p
1	Cooperative member	0.476	0.227	44.246	1	151	<0.001
2	Newspaper reading	0.553	0.306	32.991	2	150	<0.001
3	Past cooperative member	0.596	0.355	27.328	3	149	<0.001
4	Years fishing	0.623	0.388	23.456	4	148	<0.001

Table 4.17 indicates that after cooperative/precooperative membership is controlled, frequency of newspaper reading explains the greatest amount of variance with respect to lack of knowledge about fishermen's cooperatives. Cooperative/precooperative membership and frequency of newspaper reading together account for 31 percent of the variance in the dependent variable. Past cooperative membership adds five percent to the amount of variance explained, and number of years fishing adds approximately three percent more. With these four variables controlled for, the remaining five independent variables account for an insignificant proportion of the variance in the dependent variable. The first four variables entered, however, account for 39 percent of the variance, which is a respectable amount and statistically significant at better than the 0.001 level. On the basis of this analysis we can confidently state that if a fisherman is or has been a cooperative/precooperative member, frequently reads newspapers, and has been fishing for quite a while he will be likely to have more knowledge concerning fishermen's cooperative organizations than people lacking these attributes.

Conclusions

We have seen a great deal of overlap in response patterns to the three questions concerning various aspects of a fisherman's knowledge of cooperative organizations. The response category appearing most frequently dealt with provision or availability of equipment. This category appears in 143 responses, a frequency more than double any other category. It thus seems that fishermen view the cooperative primarily as a means of obtaining equipment. The fact that none of the independent sociocultural variables (age, education, cooperative/precooperative membership, years fishing) are significantly related to the distribution of this response category indicates that it is a widely shared attribute, forming part of the conceptualization of fishermen's cooperatives among fishermen in our sample.

Overall the next most frequent response dealt with marketing attributes of fishermen's cooperatives. There were a total of 71 responses which reflect this attribute. The analyses presented above show that cooperative/precooperative members are more likely to see this as an important attribute of cooperative organizations than non-members. Since marketing problems are often the greatest impediment to small-scale fisheries development, it appears that this positive attribute of fishermen's cooperatives should be stressed when trying to establish new organizations. An attempt should be made to educate the fishermen concerning the importance of the marketing function of fishermen's cooperatives.

The cooperative is also frequently perceived as being a source of funds. The total responses reflecting this attribute numbered 56. The fisherman views the cooperative as a mechanism for obtaining funds from government sources as well as a means of accumulating a pool of funds gained from dues, percentage on fish sold, and social activities. The distribution of this response category, however, indicates that cooperative/precooperative members mention this attribute significantly more than non-members. Once again, this indicates a lack of knowledge concerning cooperative organizations on the part of non-members which should be rectified if the cooperative movement is to proceed.

Forty-eight responses reflect the attribute of cooperation among members. Once again the only sociocultural variable significantly related to this attribute was cooperative/precooperative membership. There was, however, a relatively weak tendency for older fishermen to make reference to this category also.

Finally, the next most frequent high frequency response category referred to provision of adequate administration. In this case, however, it was non-cooperative/precooperative members who mentioned this category most frequently. This unexpected relationship suggests that something other than cooperative/precooperative membership is affecting the response pattern. It was therefore decided to examine response patterns of individuals who belonged to a cooperative in the past, and who had left for some reason. A total of 27 non-cooperative/precooperative members had previously belonged to a cooperative. Of these, 26 percent responded that they would improve administration if they were president of a coop-

erative. This contrasts with only 11 percent of the others -- a difference which is statistically significant ($x^2 = 4.121$, $\phi = .16$, $p<.05$). It is thus past members of cooperatives who tend to respond that proper administration is an important attribute.

Another important aspect of our findings concerns the sociocultural correlates of lack of knowledge about fishermen's cooperatives. It was demonstrated above that age, number of years fishing, cooperative/precooperative membership, years in cooperative/precooperative, television viewing, and newspaper reading are all significantly related to knowledge about cooperative organizations. A multiple regression analysis indicated that the most important correlates are cooperative/precooperative membership and newspaper reading. Exposure to mass media has often been cited as an important factor associated with change (Rogers and Shoemaker, 1971), and this analysis supports these findings. The fact that formal education is not significantly related to any aspect of our findings is extremely interesting and will be examined in the next chapter.

Overall our findings indicate that although there is some agreement concerning the meaning of a fishermen's cooperative, there is also variability in knowledge concerning this type of organization and its benefits and functions. Such variability in beliefs can lead to problems in instituting and maintaining the organizations because of varying expectations on the part of participants. It is suggested that effective techniques be developed to communicate the total meaning of this form of organization to the individual fishermen in areas where fishermen's cooperatives are either planned or in operation.

CHAPTER FIVE

CORRELATES OF FISHERMEN'S COOPERATIVE MEMBERSHIP IN THE REPUBLIC OF PANAMA

Richard B. Pollnac and Roberto Ruiz-Stout

Introduction

The fishermen's cooperative has been viewed by many as being the ideal organizational form for use in the development of small-scale fisheries. FAO (1971) notes that in addition to governmental and international organizations, the fishermen themselves often think of forming a cooperative when their situation is unsatisfactory. Gersuny and Poggie (1974) argue cogently that a cooperative can function as an organization which deals with the uncertainties of the fishermen's occupational life. They point out that collective action can be used to buffer, level, and anticipate environmental impacts. The cooperative buffers environmental influences by providing the organized fisherman with the means to secure essential services and goods (e.g., ice-making equipment, marketing specialists). It levels environmental factors by reducing the effects of fluctuations in production or consumption (e.g., through the use of cold-storage facilities, marketing information, and transportation). Finally, it minimizes uncertainty through anticipation of, and preparation for, certain contingencies, such as equipment loss or sickness. It does this through provision of insurance or welfare funds.

One would therefore expect that such organizations would have profound effects on the life-styles of their members. As discussed in the preceeding chapter, the fishermen themselves believe that the cooperative is a source for equipment, marketing services, and funds. It would thus be revealing to compare cooperative and non-cooperative members with regard to a wide range of variables. For example, we expect that cooperative members would have access to better equipment, manifest a superior material style of life, and have a positive temporal perspective. We also expect that they would be more positive toward the occupation of fishing than non-members. The purpose of this chapter and the next is to examine the interrelationships between fishermen's cooperative membership and several of these sociocultural, psychological, and technological variables in the Republic of Panama.

Tests

Cooperative or precooperative membership was measured by response to a direct question. Years of membership was also determined. Fishing technology used was determined from responses to a check list including vessel size, type and age; motor horsepower and age; and use of various net types,

handlines, etc. Material style of life was measured using a check list of household items. Other sociocultural variables (e.g., education, exposure to mass media) were measured with the use of direct questions. Attitudes toward fishing were determined by content analyses of open-ended questions (see chapter two). Temporal perspective was measured with the use of economic gratification questions (e.g., If you were to inherit $1,000, what would you do with it?).

Analysis and Discussion

Cooperative Membership. Forty-eight percent of the 153 fishermen interviewed are either cooperative or precooperative members. Table 5.1 presents frequency of membership across the seven major areas in the sample.

Table 5.1. Distribution of cooperative/precooperative membership across the seven areas sampled.

Area	Cooperative/Precooperative Member	Non-member
Chorrillo, Panama	9	5
La Playita, Colon	31	5
Farallon	--	25
Azuero Peninsula	17	16
Remedios	--	7
Pedregal	16	6
Puerto Armuelles	--	16
Total	73	80

As can be seen in table 5.1, in areas where fishermen's cooperatives are operating, the majority of fishermen interviewed report themselves as being members. When non-cooperative/precooperative members were asked why they did not join, the most frequent answer (46 percent) was that there was no cooperative operating in the area where they fish. Other reasons given for non-membership concern a desire to be independent, feelings that no benefits could be gained from membership, complaints about lack of equipment, ill feelings among members, etc. Thirty-four percent of the non-members had belonged to a fishermen's organization in the past. Most frequent rationales for leaving include internal problems in cooperative management (39 percent), cooperative equipment failure (19 percent), dissolution of group (19 percent), and personal reasons (19 percent).

Exposure to Mass Media, Formal Education, and Cooperative Membership. The exposure to the mass media variable was measured by requesting individual fishermen to indicate the number of times per week they read newspapers and magazines, watch television, and listen to the radio. Frequency of exposure to each of these four mass media were summed. forming a scale of total exposure. The analysis of this data can be found in table 5.2.

Table 5.2. Cooperative/precooperative membership and exposure to mass media.

Media	Weekly Frequency ($\bar{x}$) Non-members	Members	F Ratio	D.F.		p
Read newspapers	1.84	2.67	3.606	1	151	>0.05
Watch television	1.95	2.78	3.662	1	151	>0.05
Listen to radio	5.40	4.80	1.941	1	151	>0.05
Read magazines	0.98	1.58	3.255	1	151	>0.05
Media exposure scale	10.16	11.82	3.695	1	151	>0.05

Although the results in table 5.2 are not statistically significant, it can be seen that there is an overall tendency for cooperative members to be more exposed to the mass media than non-members. The relatively weak relationships might be the result of a variable intervening between media exposure and cooperative/precooperative membership.

In the preceding chapter, we reported a significant relationship between knowledge about fishermen's cooperative organizations and newspaper reading and television watching. Focusing on exposure to newspapers, which had the highest correlation with the lack of knowledge about fishermen's cooperative scale ($r = 0.35$, $p < .01$), it is possible to posit and test a simple causal model: First, the more formal education an individual has, the more likely it will be that he will read newspapers. Second, the more frequently one reads newspapers, the more likely it will be that he will be exposed to information concerning fishermen's cooperatives, either in the newspapers or other printed material. Third, the more information a person has concerning a cooperative, the more likely it will be that he will either form or join one. The intercorrelations between these variables can be found in table 5.3, and the simple causal model which reflects their interrelationships is depicted in figure 2. The correlations between the variables can also be found in parentheses adjacent to the arrows connecting the variables.

Table 5.3. Interrelationships between variables related to mass media exposure and fishermen's cooperative membership.

	1	2	3	4
1. Education	---	0.42*	0.15	0.05
2. Newspaper reading		---	0.35*	0.15
3. Knowledge about cooperatives			---	0.48*
4. Cooperative/precooperative member				

N = 153

*Equals $p < 0.01$.

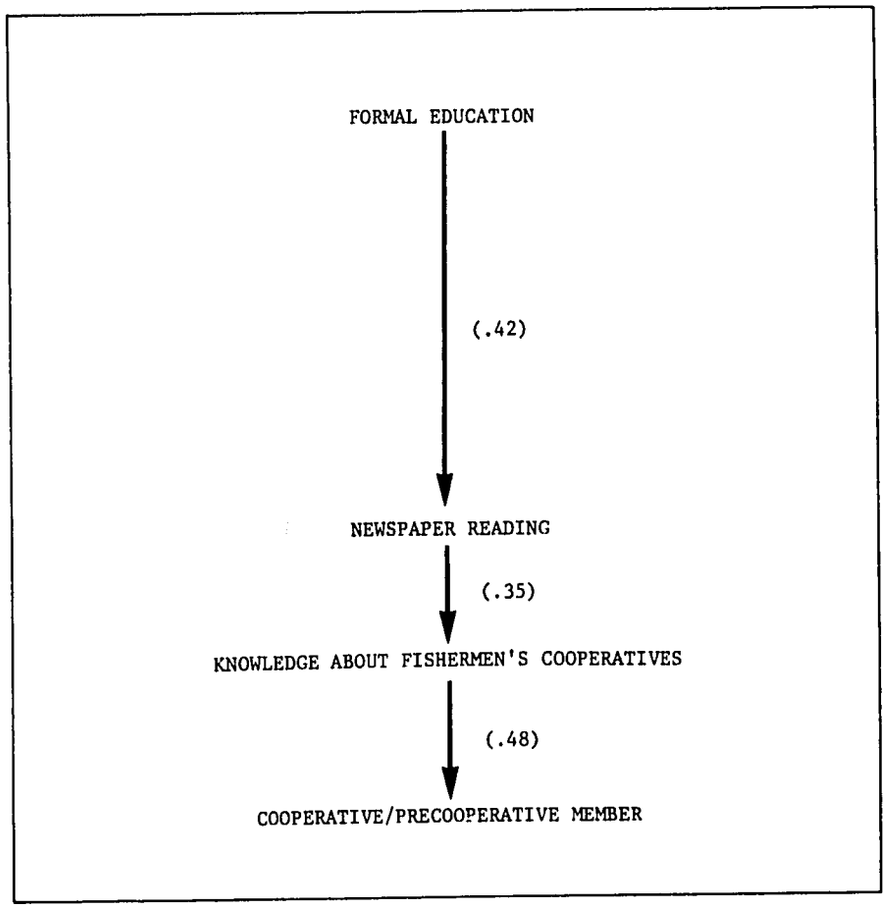


Figure 2. Model depicting proposed causal relationships between variables related to mass media exposure and cooperative/precooperative membership.

A causal model, such as that presented in figure 2 can be tested using a variety of techniques. A technique based on partial correlations (Blalock, 1964) is used here because the dependent variable is dichotomous, and the use of Beta weights as path coefficients would be questionable. This technique predicts that if the causal model depicted in figure 2 is acceptable, the following relationships should exist:

1. $r_{13.2} = 0.0$
2. $r_{24.3} = 0.0$
3. $r_{14.23} = 0.0$

In table 5.4 predicted and actual relationships are presented.

Table 5.4. Predictions and degrees of fit of mass media exposure -- cooperative/precooperative membership model.

	Expected	Actual
$r_{13.2}$	0.0	0.004
$r_{24.3}$	0.0	-0.022
$r_{14.23}$	0.0	0.013

As can be seen in table 5.4, differences between the actual and predicted partial correlations are insignificant. It should be noted, however, that we have not completely established the validity of the model -- the situation wherein all arrows are reversed would lead to identical predictions. Nevertheless, despite its mathematical acceptability, the situation in which the arrows are reversed is not a realistic theoretical alternative. We therefore suggest that the model presented in figure 2 is both theoretically and mathematically acceptable and tentatively present it as depicting the relationship between formal education, mass media exposure, and cooperative membership.

The model presented here is also important because it helps explain the unexpected lack of significant relationships between formal education and knowledge about cooperative organizations which was reported in the previous chapter. This model suggests that exposure to mass media, what Rogers (1969) refers to as the "magic multiplier," acts as an intervening variable. Thus, until exposure to mass media is taken into account, the indirect relationships between formal education and knowledge or acceptance of an innovation (here the cooperative) could be obscured.

Cooperative Membership and Attitudes toward Fishing. If a fishermen's cooperative functions as an organization which helps fishermen deal with occupational uncertainties, as Gersuny and Poggie (1974) have argued, we would expect cooperative/precooperative members to have more positive attitudes toward their occupation than non-members. Fishermen were asked what they disliked about fishing, and approximately 50 percent responded

that there was nothing they disliked. Fifty-nine percent of the cooperative/precooperative members made this positive response in contrast to only 41 percent of the non-members. This difference is statistically significant ($x^2 = 4.758$, $\phi = 0.176$, $p<.05$), thus supporting our expectations.

If the occupation of fishing is perceived more favorably by cooperative/precooperative members, we might also expect that they would have positive attitudes towards their sons becoming fishermen. This hypothesis, however, is not supported by the data. Fifty-six percent of the non-members and 45 percent of the cooperative/precooperative members report that they would like it if their sons became fishermen -- a difference that is not statistically significant ($x^2 = 1.697$, $p>.05$). This probably reflects the fact that a father's aspirations with regard to his son's occupation takes into account more factors than merely positive or negative attitudes toward the occupation. In a previous chapter we demonstrated that both area of residence and formal education are related to this variable, suggesting that knowledge of possible alternatives affects a father's occupational aspirations for his son. Nevertheless, the analysis supports the hypothesis that cooperative/precooperative members maintain a more positive perception of the occupation of fishing than non-members.

Cooperative Membership and Fishing Technology. It was noted above that fishermen perceive cooperative organizations as a source of equipment. Fishermen's cooperatives doubtless provide their members with access to needed technologies. As noted in chapter 1, many cooperative organizations maintain some marketing facilities and provide a limited amount of equipment such as nets, boats, and motors which are used by some members or rotate to all. The purpose of this section however is to examine the extent to which cooperative membership affects the technology of the individual fisherman.

Turning first to boats and motors, we find that 36 percent of the cooperative/precooperative members and 30 percent of the non-members own the boat they use for fishing. This difference is not statistically significant ($x^2 = 1.744$, $p>.05$). It is interesting to note, however, that 50 percent of the cooperative/precooperative members fish from a boat older than the sample mean ($\bar{x} = 5.6$ years). This contrasts with only 24 percent of the non-members -- a statistically significant difference ($x^2 = 6.110$, $p<.02$). This difference, however, may be due to the fact that a larger proportion of the cooperative/precooperative members know their vessel's age (63 versus 48 percent). Boat material and length for members and non-members can be found in tables 5.5 and 5.6.

Table 5.5. Vessel material cross-tabulated with cooperative/precooperative membership.

Material	Cooperative/Precooperative Non-members	Members
Iron	--	2
Fiberglass and wood	3	4
Fiberglass	23	3
Dugout (wood)	54	61
No boat	--	3
Total	80	73

Table 5.6. Vessel length cross-tabulated with cooperative/precooperative membership.

Length (feet)	Cooperative/Precooperative Non-members	Members
Missing	7	6
6-10	--	4
11-15	4	2
16-20	17	25
21-25	15	22
26-30	36	12
31-35	1	--
36-40	--	1
41-	--	1

At first glance, it appears that non-members have access to better technology in the form of larger, fiberglass boats. This difference is not quite so striking, however, if one takes into account the fact that of the 23 non-members who fish from fiberglass boats, 12 are from Remedios and Farallon where pre-existing fishermen's organizations were instrumental in introducing this advanced technology. Further, 11 are from Mensabe and south on the Azuero Peninsula where some fishermen use fiberglass boats provided by the government plant at Mensabe. Since most of the fiberglass boats are in the 26-30 foot range, this distribution also accounts for the high frequency of boats in this range used by non-members.

Seventy-four percent of cooperative/precooperative members and 76 percent of non-members use mechanized vessels. Modal horsepower is 20 and modal age of motors is three years for both members and non-members. Differences between the two groups are not statistically significant.

Finally, other types of fishing equipment used are compared in table 5.7.

Table 3.7. Fishing equipment employed by cooperative/precooperative members and non-members.

Equipment	Cooperative/Precooperative Non-members	Members
Hook and line	52	60
Traps	--	1
Cast net	8	28
Monofilament gill net	36	36
Multifilament gill net	2	10
Beach net	2	6
Lobster net	5	1
Barrier net	5	--

Cooperative Membership and Material Style of Life. If fishermen's cooperatives are improving the lot of small-scale fishermen, we would expect cooperative members to manifest a material style of life superior to that of non-members. Material style of life was measured from responses to a checklist which contained various material items. These items and their distributions can be found in table 5.8.

Table 5.8. Cooperative/precooperative membership cross-tabulated with selected material items.

Item	Cooperative/Precooperative Non-member	Member	x^2	p (one-tailed)
Own house	79%	66%	3.237	<0.05
Indoor plumbing	33	26	0.770	>0.05
Electricity	38	66	12.192	<0.001
Radio	75	70	0.505	>0.05
Television	23	37	3.858	<0.05
Refrigerator	23	27	0.490	>0.05
Sewing machine	29	27	0.035	>0.05
Indoor toilet	18	15	0.165	>0.05

N = 153.

Table 5.8 indicates that the results are statistically significant in the expected direction in only two cases: electricity and television ownership. In one case, house ownership, the results are significantly the opposite of our predictions. Nonetheless, the fact that more cooperative/precooperative members than non-members have electricity suggests a superior material style of life on their part, of which television ownership is only one example. Electric lights and other appliances which were not included on the checklist are also implied, or at least their potential is indicated. Cooperative/precooperative membership thus appears to significantly affect the material style of life of its members, probably through increased earnings resulting from the organization's dealing with environmental uncertainties as discussed above.

Temporal Perspective and Cooperative Membership. There are several aspects of temporal perspective which may be related to cooperative membership. First, membership in a cooperative or precooperative does not always provide immediate rewards. The member finds that he is paying dues for future benefits: a dividend at year's end, access to better equipment in the future, etc. This suggests that cooperative members may be more willing to defer gratification than non-members, to invest for future benefits (cf. Pollnac, Gersuny, and Poggie, 1975). Second, if a cooperative organization functions to deal with uncertainties in fishermen's lives, we would expect members to have a more positive perception of the future than non-members who are daily faced with these uncertainties without mediating influences. Cooperative membership and perception of the future will be examined in the next chapter. Here we will examine the relationship between gratification orientations and cooperative/precooperative membership.

With respect to gratification orientations, respondents were asked two questions:

(1) If you were to suddenly receive $200 as a gift or inheritance, what would you do with it?

(2) If you were to suddenly receive $1,000 as a gift or inheritance, what would you do with it?

Responses to these questions were coded as reflecting a deferred gratification orientation if they reflected a future rather than an immediate gain (e.g., invest in fishing equipment, business, agriculture, bank). Other responses (e.g., buy a house, automobile) were coded as immediate. Table 5.9 compares deferred economic gratification response frequencies for members and non-members.

Table 5.9. Economic gratification patterns and cooperative/precooperative membership.

	Cooperative/Precooperative Non-members	Members	x^2	p	N
Do with $200 (% deferred)	63	71	0.816	>0.05	123
Do with $1,000 (% deferred)	66	60	0.518	>0.05	152

As can be seen in table 5.9, members and non-members do not differ significantly with regard to proportion of deferred responses. As least 60 percent of both groups provide deferred responses to both questions. It has been argued elsewhere that certain factors associated with the occupation of fishing result in a deferred orientation on the part of fishermen, e.g., periodicity of income and small-scale entrepreneurship (Pollnac, Gersuny, and Poggie, 1975). The data presented here appear to support these findings and suggest that factors such as cooperative membership have little to do with deferred gratification orientations.

Conclusions

In sum, we have examined the correlates of fishermen's cooperative membership among small-scale fishermen in the Republic of Panama. A causal model was developed and tested relating cooperative/precooperative membership to formal education as mediated by exposure to mass media and knowledge about cooperative organizations. Exposure to mass media, especially newspapers, was found to be an essential factor in the causal chain. The relationship between cooperative/precooperative membership and individual fishing technology was ambiguous. Nevertheless, it is noted that these organizations do provide some essential marketing services as well as equipment. There was also some indication that cooperative/precooperative members manifest a slightly better material style of life. Further, the proposition that a cooperative functions to deal with the uncertainties of the fishermen's occupational life was supported. Cooperative/precooperative members were found to be more positive toward the occupation of fishing than non-members. Overall, our findings suggest that the cooperative/precooperative fishermen's organizations in the Republic of Panama have no negative effect on the small-scale fisherman; in general, the effects of these organizations seem to be positive.

CHAPTER SIX

COOPERATIVE MEMBERSHIP AND OPTIMISM AMONG SMALL-SCALE FISHERMEN IN PANAMA[1]

Michael C. Robbins, Linda C. Robbins, and Richard B. Pollnac

Introduction

As discussed in the previous chapter, Gersuny and Poggie (1974) argue cogently that a cooperative can function as an organization which deals with the uncertainties of the fishermen's occupational life. They point out that collective action can be used to buffer, level, and anticipate environmental impacts. These important functions of organizations are discussed in detail in Thompson (1967). It is proposed that these functions of cooperatives alleviate stress among fishermen who gain their living from an exceptionally variable resource base. A fisherman's income is dependent on catch size which is difficult to predict. There are times when catches exceed demand, thus lowering prices paid and sometimes resulting in loss due to spoilage. There are also times when boats return empty or weather prevents fishing (cf. Pollnac, Gersuny, and Poggie, 1975; Pollnac and Poggie, 1976). This periodicity in catch is leveled somewhat by technologies provided by cooperative organizations which are often beyond the means of individual fishermen. Cold storage, transportation facilities, and marketing specialists form part of a technological core which is supported by the organizational framework of many fishermen's cooperatives.

The marine environment also has important impacts on equipment. The ceaseless motion in combination with sudden, violent storms at sea make fishing equipment especially liable to sudden damage or loss. Additionally, the corrosive effects of salt water hasten deterioration of capital equipment. Norr and Norr (1974) argue that the rapid depreciation of fishing equipment, in combination with occasional losses, result in high rates of occupational mobility. This uncertainty with respect to productive equipment is stressful for individual fishermen, and fishermen's cooperatives can function to minimize this uncertainty by several means. They often provide a pool of equipment which can be used by members in need, thus minimizing the non-productive period due to loss. Cooperatives can also provide funds for resident mechanics who guide members in preventative maintenance and provide needed repairs. Finally, cooperatives can also serve as vehicles for acquisition of loans in times of need, either from internal funds or by facilitating contact with lending agencies.

The mediating influence of fishermen's cooperatives becomes even more important in developing countries where changes in technology and inflation create uncertainties and problems which can be more effectively dealt

with by organizations than individuals. The cooperative functions as a buffer between the changing environment and fishermen by providing an institutional framework for the transfer of information concerning new technologies (cf. Rogers and Shoemaker, 1971; Morss, et al, 1976). The cooperative also provides a link with lending agencies which facilitates purchase of expensive capital equipment in an inflationary environment.

As an organization which deals with the stress-producing, long-term problems which are an integral part of the marine environment, the fishermen's cooperative can be viewed as a coping system (cf. Powell, 1975). It is suggested that fishermen within such systems feel more secure and have more positive temporal perspectives than those faced by the uncertainties and periodicity of the marine environment without the mediating influence of a coping system. Specifically, we hypothesize that cooperative members (CM) will be more optimistic about attaining their most desired life goals than non-members (NM).

Tests

Degree of optimism concerning attainment of life goals was measured with the use of the ladder of life test (cf. Cantril, 1963). The ladder of life test consisted of showing the respondent a ladder diagram with ten rungs. He was told that the top rung represented the best possible life and the bottom, the worst. He was then requested to tell us where he stood on the ladder at the present time, five years in the past, and five years in the future.

Analysis

It is important to note that 25 individuals refused to indicate where they would be on the ladder of life five years in the future. They made responses such as "who knows," "God only knows." Responses such as these suggest a feeling of lack of control or uncertainty about the future. If, as was hypothesized, a cooperative organization functions to reduce such uncertainty, we would expect CM to be more likely to hazard a guess about their future than NM. An analysis of the data indicates that only seven percent of the CM refused to hazard a guess, in contrast to 25 percent of the NM. This difference is statistically significant ($x^2 = 9.918$, $p<.01$). It thus appears that CM are less uncertain about their future than NM -- a difference that may be the result of the buffering, leveling, and anticipatory functions of cooperative organizations.

Means of responses on the ladder of life test can be found in table 6.1.

Table 6.1. Comparisons of mean position on ladder of life for cooperative members and non-members.

Time	Non-members	Members	F Ratio	D.F.		p
5 years ago	3.75	3.19	1.461	1	149	>0.05
Today	4.70	4.66	0.007	1	151	>0.05
5 years from today	8.40	8.59	0.207	1	126	>0.05

As can be seen in table 6.1, there are no significant differences between CM and NM. The analysis presented in table 6.1, however, restricts comparisons to perceived and expected degrees of goal attainment at single points in time. It is possible that an examination of tendencies toward change (or stability) over time in expectations of attaining life goals may reveal important differences between CM and NM; hence, responses to the ladder of life test conceptualized as expected degree of attainment of life goals are further analysed as a probabilistic temporal process.

"...In a stochastic (or probabilistic) process a phenomenon is represented as a set of states that are maintained over time or are altered in accordance with a set of transition probabilities" (White, 1974:373). Several conditions make this mode of analysis appropriate for the present study. (1) The number of positions (or "states" in the language of stochastic processes) on the ladder of life test is finite. This is given by the nature of the choice task. (2) Observations of respondents' perceptions of their positions at more than one, equally spaced, time interval (five-year period) are available. This is given by the nature of the panel design. (3) A transition probability matrix can be constructed from the proportion of respondents expecting to be in a specific position or state on the ladder of life test at one time period (e.g., future) according to their perceived position or state at another (e.g., present). And, (4) the mathematical machinery of Markov chains can be employed to model the process of expected life-goal attainment (cf. Kemeny and Snell, 1960; Kemeny, et al, 1974). The Markov model assumes that the number of positions or states is finite, observations are available at equally-spaced time intervals, and a respondent's state at time $t + 1$ should depend at most upon his state at time t. The assumptions of maximum dependence of a respondent's state at time $t + 1$ on his state at time t, and stationarity over time of the probabilities governing transitions between states in the system, are of course subject to doubt and usually require empirical verification. In the present study, however, this hardly matters, for we do not intend to use the actual longitudinal projections extrapolated from the model. Rather, what we are interested in detecting are certain consequences that would result if transitions among states, determined by a matrix of transition probabilities, occurred over an indefinite period. These ultimate consequences are interpreted as tendencies implicit in the nature of the transition matrices of expected goal attainment of CM and NM. Put another way, the utility of the model is not contingent upon whether or not the empirical patterns "fit" a Markov chain process, but rather on its value as a frame of reference for analyzing the cross-sectional data and for comparing the structure of potential shifts between the two groups.[2]

Given the nature of these data then, and the possibilities for a stochastic process analysis, our aim here is to explore the postulate that, for reasons described above, a tendency is displayed for CM to be more optimistic than NM because (1) a greater proportion of CM than NM expect to ultimately attain their most desired life-goals and (2) at a faster rate. To accomplish this we shall: (1) Compare the structure of the transition probability matrices of CM and NM constructed from respondents' expected future positions on the ladder of life test and their perceived positions at present. (2) Compare the proportional distribution of CM

and NM in the state-sets (vectors) at both t (present) and time $t + 1$ (future) and at projected time intervals in the future as extrapolated from the transition matrices used to generate them. And (3) compare the rate of change (or transition velocity) of CM and NM to their ultimate state in the life-goal attainment process.

In table 6.2, we present the probability vectors of CM and NM at both time t (present) and time $t + 1$ (future). The components of these vectors specify the proportion of respondents in each position (or state) at both time periods.[3] These data indicate that at both time t (present) and time $t + 1$ (future) the differences between the two groups are minimal. For example, although approximately 13 percent more NM than CM perceive themselves to be on the bottom-most rung of the ladder of life test at present, about 15 percent more NM than CM also see themselves to be on the top. It is also apparent that there is even less difference between where the two groups expect to be in the future. Focusing on each time period separately then, few if any differences are apparent between the two groups.

Table 6.2. Vectors at time t and $t + 1$.

	Present (time t)				
	S_1	S_2	S_3	S_4	S_5
Coop (N = 67)	.194	.254	.358	.060	.134
Non-coop (N = 59)	.322	.186	.170	.034	.288
	Future (time $t + 1$)				
	S_1	S_2	S_3	S_4	S_5
Coop (N = 67)	.015	.015	.149	.209	.612
Non-coop (N = 59)	.051	.051	.119	.203	.576

Table 6.3 displays the transition probability matrices for each group. Each element of the matrices indicates the proportion of the sample who expect to be in a certain state in the future according to where they perceive themselves to be at present. For example, consider the top row of the CM transition matrix. The proportion of CM at S_1 at present who expect to be in S_1 in the future is .00. The proportion of CM at S_1 at present who expect to be at S_2 in the future is .077, at S_1 in the present and S_3 in the future .385, at S_1 in the present and S_4 in the future .077, at S_1 in the present and S_5 in the future .461 and so on. Mathematically,

Table 6.3. Transition probability matrices for cooperative members & non-members.

Cooperative Members (N = 67)

From: Present \ To: Future	S_1	S_2	S_3	S_4	S_5
S_1	.000	.077	.385	.077	.461
S_2	.059	.000	.294	.412	.235
S_3	.000	.000	.000	.250	.750
S_4	.000	.000	.000	.000	1.000
S_5	.000	.000	.000	.000	1.000

Non-members (N = 59)

From: Present \ To: Future	S_1	S_2	S_3	S_4	S_5
S_1	.105	.053	.158	.210	.474
S_2	.000	.182	.364	.273	.182
S_3	.000	.000	.000	.400	.600
S_4	.000	.000	.000	.000	1.000
S_5	.059	.000	.000	.059	.882

these statements are equivalent to saying "the probability a CM at S_1 in the present will remain in S_1 in the future is .00; of attaining S_2 .077," etc. The matrix then, specifies the relative probabilities of the five possible transitions from state to state over one five-year interval. Hence, it is called a "transition probability matrix." With the data transformed into these arrays, some additional comparisons between CM and NM can be made. For example, the proportions of each sample above, below, and on the main diagonal provide an approximate, but convenient, index of the relative amount of optimism, pessimism, and inertia respectively between the two groups. These figures are provided in table 6.4. They are presented in two ways. At the top are the percentages with those remaining in S_5 included in the measure of inertia. Below are found the figures with those remaining in S_5 included in the measure of optimism and those remaining in S_1 included in the measure of pessimism. The latter is probably more reasonable since S_5 is the highest step on the ladder and confidence in remaining there five years into the future

Table 6.4. Matrix index of optimism.*

	Optimism	Pessimism	Inertia
Coop	.851 (57)	.015 (1)	.134 (9)
Non-coop	.644 (38)	.034 (2)	.322 (19)
($S_1 \longrightarrow S_1$ = Pessimism)			
($S_5 \longrightarrow S_5$ = Optimism)			
Coop	.985 (66)	.015 (1)	.000 (0)
Non-coop	.898 (53)	.068 (4)	.034 (2)

*Numbers given in parentheses.

should indicate some optimism. Likewise, expecting to remain on the bottom should indicate some pessimism. These tend to show some differences between the two groups in the expected direction. While for the most part both groups are predominantly optimistic, viewed either way, there is a greater tendency for CM to display proportionately more optimism and less pessimism and inertia with regard to attaining their most desired life-goals than NM. An even more impressive difference between the groups emerges from a closer inspection of the nature of the differences between the two transition matrices. For the CM, S_5 is a terminal or absorbing state which once attained is never left (i.e., the probability of remaining in S_5 is 1.00). It can also be seen that is is possible to reach this state from every other state (though not necessarily in one step or five-year interval). These features define this form of transition matrix as an absorbing Markov chain (Kemeny, et al, 1974: 214-219). This fact guarantees one important consequence -- the probability that the population will eventually be absorbed is 1. That is, if the process of life-goal attainment continues as before, then everyone in the CM sample will eventually reach the highest or more desired life-goal or state (S_5) and remain in it.[4]

The procedure for demonstrating this is straightforward and can be accomplished using a little matrix algebra. If $\underline{p}$ is a row vector, the components of which specify the proportion of the population in each state at the present (see top of table 6.2), and $\underline{P}$ is the matrix of transition probabilities from time $\underline{t}$ (present) to $\underline{t} + 1$ (future) (see table 6.3), then $\underline{p}\,\underline{P} = \underline{p}^{(\underline{t}+1)}$, where $\underline{p}^{(\underline{t}+1)}$ is the future vector the components of which specify the proportion of the population in each of the states at $\underline{t} + 1$ (five years in the future, see bottom of table 6.2). It can also be shown that $\underline{p}\,\underline{P}^n = \underline{p}^{(\underline{t}+n)}$, that is by raising $\underline{P}$ to the n^{th} power and then multiplying by $\underline{p}$ one obtains the proportion in each state at time $\underline{n}$. For example, to extrapolate the proportion of the population in each of the states at time $\underline{t} + 2$ (10 years into the future), we use the equation $\underline{p}\,\underline{P}^2 = \underline{p}^{(\underline{t}+2)}$. To determine if the process will eventually terminate in an absorbing state and the number of time intervals this will take, we

simply estimate, by successive exponentiation of the CM matrix in table 6.3, the time interval in the future (or power of $\underline{P}$) where each column has the same values to two significant digits. In the case of CM, this occurs at the 5^{th} power of $\underline{P}$ -- all the elements of the first four columns of $\underline{P}^5$ are .000, and all the elements of the fifth column are 1.000. Thus, in accordance with the absorbing nature of the CM transition matrix, everyone in the CM sample can be expected to reach the most desired life goal (or state S_5) and remain there after five time intervals.

Table 6.5. Cooperative member absorbing-state matrix.

$$\underline{P}^5 = \begin{array}{c} \\ S_1 \\ S_2 \\ S_3 \\ S_4 \\ S_5 \end{array} \begin{array}{c} \begin{array}{ccccc} S_1 & S_2 & S_3 & S_4 & S_5 \end{array} \\ \begin{pmatrix} .000 & .000 & .000 & .000 & 1.000 \\ .000 & .000 & .000 & .000 & 1.000 \\ .000 & .000 & .000 & .000 & 1.000 \\ .000 & .000 & .000 & .000 & 1.000 \\ .000 & .000 & .000 & .000 & 1.000 \end{pmatrix} \end{array}$$

Turning to the NM transition matrix, we see by comparison that this is not the case. This matrix has the characteristics of a regular Markov chain whereby some power of the transition matrix has all positive, non-zero elements (Kemeny, et al, 1974). This indicates that there is always some probability of going from any state to any other state at any transition (i.e., after any five-year interval elapses) and this includes the highest state S_5. This means that although there is always some probability of attaining (and remaining in) S_5, the most desired life state, there is also always an associated probability of leaving it. Because this is a regular (as opposed to an absorbing) chain, it further guarantees the fact that at no time will all NM attain and remain in the highest ladder of life state. Instead, if the transition probabilities remain the same, a fixed point, or equilibrium vector, will be reached wherein some proportion of the sample will always be distributed in other states as well. These proportions will always remain invariant when further multiplied by the transition matrix. The equilibrium vector is indicated by the power of the matrix wherein all columns are identical (to two significant digits). In the case of NM, this occurs at the 7^{th} power of $\underline{P}$ and results in the following equilibrium vector: $S_1 = .057$, $S_2 = .004$, $S_3 = .010$, $S_4 = .068$, $S_5 = .861$.[5]

Table 6.6. Non-member fixed-state matrix.

$$\underline{P}^7 = \begin{array}{c} \\ S_1 \\ S_2 \\ S_3 \\ S_4 \\ S_5 \end{array} \begin{array}{c} \begin{array}{ccccc} S_1 & S_2 & S_3 & S_4 & S_5 \end{array} \\ \begin{pmatrix} .057 & .004 & .010 & .068 & .861 \\ .057 & .004 & .010 & .068 & .862^* \\ .057 & .004 & .010 & .068 & .861 \\ .057 & .004 & .010 & .068 & .861 \\ .057 & .004 & .010 & .068 & .861 \end{pmatrix} \end{array}$$

*Error due to rounding.

Thus in sum, the results of the stochastic analysis suggest that the two groups differ in the following important respects: (1) a greater proportion of CM than NM are optimistic about attaining their most desired life-goals; (2) a greater proportion of CM than NM ultimately expect to attain their most desired life-goals: and (3) once attained, a greater proportion of CM than NM will remain in their most desired life-state (S_5). Finally, it can be observed that CM will reach their ultimate state (total attainment of their most desired life-goal) before NM will reach theirs (proportional distribution in the state-set specified by the equilibrium vector). It will be recalled that after five, five-year intervals into the future ($\underline{P}^5$) all CM would have attained S_5, the highest position on the ladder of life test. In contrast, it would take seven, five-year intervals into the future ($\underline{P}^7$) for NM to reach their fixed point vector. Thus we can infer that the CM will attain their ultimate state two time intervals earlier than the NM (or faster) if the process continues as it started.

It is perhaps worth adding that even if we convert the NM regular matrix in table 6.3 to an absorbing state matrix by eliminating those respondents who are in S_5 at present but do not expect to remain there (i.e., transform elements $\underline{p}_{51}$ and $\underline{p}_{54}$ to .000 and $\underline{p}_{55}$ to 1.000), their time to absorption will still be slower. It would take seven intervals for this to occur as opposed to five for the CM.

Overall, these results support the postulate that there is a tendency for CM to ultimately display more optimism and attain their most desired life-state faster than NM.

To conclude, the logic of probabilistic temporal models in the form of Markov chain processes has been used to detect and compare tendencies toward change and stability in expectations of achieving most desired life-goals. It is argued that whether or not the actual predictions generated by the model are empirically "true" is irrelevant. What is significant is that the application of the model and the logic of processual inferences to the cross-sectional data on CM and NM expectations has enabled us to discover differences in support of the postulate that

there is a tendency for CM to be more optimistic than NM. Had we not used this model these differences might not otherwise have been apparent.

Conclusions

Viewed in concert, the results of this study provide modest but consistent support for the hypothesis that small-scale Panamanian fishermen who are members of cooperatives are more optimistic about attaining the best possible life they aspire to than fishermen who are not members. This conclusion is adduced from the following results: (1) More CM than NM are willing and able to estimate their future position on the ladder of life. (2) Of those that do, more CM expect to attain the highest goals they aspire to than NM. And (3) CM expect to attain their best possible life faster than NM. Nevertheless, until further research can be extended in several directions, this conclusion, and its many and varied implications, must remain tentative. Among the several paths this might take are: (1) Attempts to assess the causal direction implied by the relationship between expected goal attainment and cooperative membership. Do cooperatives somehow produce more optimistic fishermen or do more optimistic fishermen simply join cooperatives? And, if the former is true, what is it specifically about belonging to a cooperative that predisposes members to become more optimistic (economic security, information access)? (2) Attempts to assess and compare the content and meaning of the empirical goals that make up the "best (or "worst") possible life" and points in between. How similar or different are the constituents of the goals of cooperative and non-cooperative members? How do these change (or remain stable) over time as a consequence of belonging or not belonging to cooperatives? (3) Attempts to discover and assess the correlates and consequences of optimism-pessimism. Are more optimistic fishermen also more likely to delay gratifications, innovate and achieve economic success more than less optimistic fishermen? Are more pessimistic fishermen more likely to experience frustration, anxiety and perhaps engage in deviant behavior? More research is clearly indicated to answer these questions.

Notes

[1]We wish to thank Andy Walker of the University of Missouri Computer Center for his aid in writing the matrix programs used in this study. We are also grateful for the use of the computer facilities of the University of Rhode Island Computer Center.

[2]Fuguitt (1965) has employed Markov chain models in a similar manner to study demographic trends in small towns. He also observes that this is analogous to using the "net reproduction rate" as a descriptive measure of fertility at a single point in time even though it is couched in longitudinal terms.

[3]The 10-step ladder of life test was collapsed to five steps: 1 + 2 = 1, 3 + 4 = 2, 5 + 6 = 3, 7 + 8 = 4, and 9 + 10 = 5. This was done so that sample sizes in each state would not be inoperatively small. This resulted in no appreciable difference.

[4]A major theorem of absorbing Markov chains is that the probability that the process will be absorbed is 1. Kemeny, et al (1973: 214-219) provide a basic idea of the proof of this theorem.

[5]A more elegant, and less tedious, procedure for discovering the equilibrium vector of a regular Markov chain is to solve a system of linear equations. Since $\underline{P}$ is a regular transition matrix we know that $\underline{P}$ has a unique fixed probability vector $\underline{p}^*$, the components of which are all positive. Further, the values of the components of $\underline{p}^*$ will not change when multiplied by any power of $\underline{P}$ or $\underline{p}^* \underline{P} = \underline{p}^*$. Using the transition probability matrix in table 6.3, the following matrix equation will hold:

$$(x^1,x^2,x^3,x^4,x^5) \begin{pmatrix} .105 & .053 & .158 & .210 & .474 \\ .000 & .182 & .364 & .273 & .182 \\ .000 & .000 & .000 & .400 & .600 \\ .000 & .000 & .000 & .000 & 1.000 \\ .059 & .000 & .000 & .059 & .882 \end{pmatrix} = (x^1,x^2,x^3,x^4,x^5)$$

This results in the following system of linear equations:

$$\begin{aligned} x_1 + x_2 + x_3 + x_4 + x_5 &= 1 \\ .105x_1 + .000x_2 + .000x_3 + .000x_4 + .059x_5 &= x_1 \\ .053x_1 + .182x_2 + .000x_3 + .000x_4 + .000x_5 &= x_2 \\ .158x_1 + .364x_2 + .000x_3 + .000x_4 + .000x_5 &= x_3 \\ .210x_1 + .273x_2 + .400x_3 + .000x_4 + .059x_5 &= x_4 \\ .474x_1 + .182x_2 + .600x_3 + 1.000x_4 + .882x_5 &= x_5 \end{aligned}$$

from which we readily compute $\underline{p}^*$ = (.057, .004, .010, .068, .861).

CHAPTER SEVEN

GRATIFICATION ORIENTATIONS AMONG SMALL-SCALE FISHERMEN IN THE REPUBLIC OF PANAMA

Richard B. Pollnac and Roberto Ruiz-Stout

Governments and other institutions, as well as individuals, continually make decisions concerning allocation of available funds -- decisions which in the aggregate affect them and the societies in which they exist. At the lowest level in this decision-making process we find the individual The individual's low level, however, does not reflect a low level of importance; in fact, it suggests a basic importance. One needs only reflect on the American government's use of tax reductions to stimulate the economy. The use of this procedure assumes that individuals will immediately spend such windfalls, thus increasing business activity. But individuals do not only practice immediate gratification -- they sometimes invest resources for future gains. As Doob (1971:409-410) has noted, there is a time and a place for varying temporal orientations. Some individuals under certain conditions defer gratification, that is, they postpone immediate desires in order to obtain more substantial rewards in the future. Other individuals immediately gratify their desires. Changing social conditions, however, may substantially alter this pattern (cf. Thompson, 1975).

Many scholars (e.g., Dundes, 1969; Graves, 1966) contend that deferred gratification is an important cultural pattern in modern Euro-American society. Weber (1930) suggests that the Protestant ethic promotes this behavior pattern, which is alleged to be central to modern day industrial and capitalistic society. In contrast to these arguments, however, everyday experience suggests that modern Euro-American economies are based on immediate gratification. Almost anything can be obtained with easy credit plans. As was noted above, recent government tax cuts are based on the assumption that individuals will immediately spend increased income and stimulate the economy. It therefore seems that modern societies are characterized by easy credit and immediate gratification patterns which serve to fuel the economy (Pollnac, Gersuny, and Poggie, 1975). Research indicating a tendency for deferred gratification behavior to increase, level off, then decrease as degree of modernization increases is in agreement with these observations (Pollnac and Robbins, 1972).

Despite these varying interpretations, it is clear that there is a complex relationship between gratification patterns and individual or societal economic development. Further, a recent study indicates that cooperative credit schemes are often reduced in effectiveness due to unproduc-

tive use of available funds (UNRISD, 1975). It seems therefore that an understanding of the variables influencing gratification orientations can be of immense value in planning community change.

A great deal of research has related deferred gratification to a host of variables. For example, variability in gratification orientations has been related to modernization and acculturation (Doob, 1960; Graves, 1967; Rogers, 1969; Inkles, 1969; Pollnac and Robbins, 1972; Robbins and Thompson, 1974; Thompson, 1975), age (Mischel and Metzner, 1962; Lessing, 1968; Pollnac and Robbins, 1972), socioeconomic status (Graves, 1967; Wober and Musoke-Mutanda, 1971; Thompson, 1975), urbanization (Gold, 1967; Robbins and Thompson, 1974; Thompson, 1975), economic predictability and security (Rodgers, 1967; Meade, 1971; Robbins and Thompson, 1974; Thompson, 1975), community level of economic development and industrialization (Turner, 1971; Rosen, 1971), reward salience (Mischel, Ebbesen, and Zeiss, 1972; Robbins and Thompson, 1974; Thompson, 1975), efficacy and optimism (Pollnac, Gersuny, and Poggie, 1975; Thompson, 1975), occupation and periodicity of income (Pollnac, Gersuny, and Poggie, 1975).

Thompson's research is of special methodological significance. He found little overall relationship between various independent variables and deferred gratification behavior until he examined the interrelationships within specific sub-groups of his sample. Most important, he demonstrates that there are cross-group differences in the variables related to economic gratification patterns and relates these differences to socioeconomic security (Thompson, 1975). The present paper builds upon the above findings. Specifically, we examine the interrelationships of economic gratification patterns with age, occupation, income, self-evaluation of socioeconomic position at various time periods, material culture, ownership of means of production, education, exposure to mass media, and urbanization among small-scale fishermen in the Republic of Panama.

Methods

Sample. Data for this report are based on interviews with 153 Panamanian small-scale fishermen conducted from Colon on the Atlantic coast to Panama City on the Pacific and at various locations along the Pacific coast to the Costa Rican border. The sample is further broken down into three subgroups on the basis of exposure to a modern urban lifestyle: (1) an urban subgroup consisting of fishermen from La Playita, Colon, and Chorrillo, Panama City; (2) an intermediate subgroup of fishermen from Pedregal, Puerto Armuelles, and Boca Parita; and (3) a rural subgroup of fishermen from Farallon, La Enea and south on the Azuero Peninsula, and Remedios. The urban subgroup is located in towns with populations exceeding 50,000, the intermediate adjacent to or in towns with populations exceeding 10,000 but less than 50,000, and the rural subgroup is adjacent to towns with populations of 5,000 or less. Locations of the various fishermen's groups are more thoroughly described in the first chapter of this report.

Tests. The dependent variable, economic gratification patterns, was measured with the use of two questions: (1) If you were to receive $200

as a gift or inheritance what would you do with it? (2) If you were to receive $1,000 as a gift or inheritance what would you do with it?* Responses to each question were coded as deferred if the response reflected an investment for future gain (e.g., purchase fishing equipment, put in bank, buy a business), or immediate if lacking an investment factor (e.g., buy things for the house, clothing). Responses including both categories were coded as mixed. Distributions of response categories can be found in table 7.1. The immediate category was assigned a value of one, the mixed a value of two, and the deferred a value of three. The values assigned to each of the two questions were summed for each fisherman resulting in a scale having a range from two to six. This scale will be referred to as the EGPCOMP Scale. Responses to the $200 and $1,000 questions will be referred to as the EGP200 and EGP1000 Scales respectively.

Table 7.1. Distribution of categorized responses to economic gratification pattern questions.

		Frequency	
Response	Category	$200 Question	$1,000 Question
Invest in fishing equipment	deferred	58	64
Invest in business	deferred	10	16
Invest in agriculture	deferred	--	3
Invest (non-specific)	deferred	10	6
Bank	deferred	4	5
Put aside	deferred	--	2
Mixture	mixed	11	22
For house	immediate	10	20
Other (e.g., food, clothing, alcohol)	immediate	20	15
Total		123	153

Among the independent variables age was measured by response to a direct question. With respect to occupation the sample consisted entirely of fishermen, but it was expected that length of time as a fisherman would be an important factor, so respondents were asked how long they had been fishing. The fisherman's father's occupation was also determined as well as whether or not the fisherman had a job other than fishing. The past month's income from fishing and other occupations were separately recorded.

Self-evaluation of socioeconomic position was determined with the use of the ladder of life test (cf. Cantril, 1963). The ladder of life test consisted of showing the respondent a ladder diagram with ten rungs. He was told that the top rung represented the best possible life and the bottom, the worst. He was then requested to tell us where he stood on the ladder at the present time, five years in the past, and five years in the future.

Material culture was measured with the use of a checklist containing eight material items: (1) own a house; (2) indoor plumbing; (3) indoor

*The rate of exchange of the balboa, the Panamanian currency, is approximately 1B = $1US. For the purposes of this paper we have used the dollar sign throughout.

toilet; (4) electricity; (5) radio; (6) television; (7) refrigerator; (8) sewing machine. Each item was assigned a score of one if present and zero if absent. The scores for all eight items were summed forming a scale of material items. Item total correlations were calculated and all were high (ranging from 0.51 to 0.75) except for house ownership. House ownership was eliminated from the scale, and item-total correlations were recalculated. All item-totals were high (ranging from 0.46 to 0.77; $p<.01$). The resultant scale, composed of seven items, is referred to as the material culture scale. House ownership is considered as a separate dichotomous variable.

Ownership of the means of production was considered as a potential indicator of economic security. This variable was measured by asking the individual fisherman if he owned the boat he fished from.

Exposure to mass media was measured by asking the fisherman how many days per week he listened to the radio, read newspapers, watched television, read magazines, and went to the cinema. The frequencies for the five mass media were summed forming a scale with a potential range of from zero to 35. Item total correlations were calculated and were found to range from 0.39 to 0.69, all significant at better than the .01 level. This scale is referred to as the mass media exposure scale.

Education was measured with a direct question concerning number of years of formal schooling. Finally, urbanization was evaluated on the basis of the categorization of the sample described above which divided the sample into urban, intermediate, and rural subsamples.

Study One: Total Sample Combined

Analysis. The interrelationships between the dependent and independent variables can be found in table 7.2.

Table 7.2 presents an analysis of the interrelationships between the independent variables and the EGPCOMP and EGP1000 scales. The $200 question was not posed to 30 members of the sample, thus sample sizes vary for the two scales. Additionally, some respondents did not answer the income questions and refused to hazard a guess concerning the future component of the ladder test. Tests of significance take these variations in sample size into account.

Overall, the interrelationships between the dependent and independent variables are relatively weak. Only two of the independent variables are significantly related to each of the scales: a fisherman father and boat ownership with the EGPCOMP scale, and age and fisherman father with the EGP1000 scale. Since the independent variables taken one at a time account for only a small proportion of the variance in the dependent variables, a stepwise multiple regression was conducted to determine the relationships between some of the independent variables in combination and economic gratification patterns. In this procedure, all of the independent variables are intercorrelated with the dependent variable and the

Table 7.2. Interrelationships between the independent and dependent variables for the total sample combined.

Independent Variable	EGPCOMP	EGP1000
Age	.161	.184*
Years fishing	-.065	-.003
Father fisherman	-.244**	-.306**
Two occupations	-.080	-.131
Income from fishing	-.175	-.087
Other income	.031	-.137
Own boat	.298**	.104
Own house	.084	-.126
Material culture scale	-.072	-.151
Formal education	-.038	-.029
Mass media exposure scale	.065	.070
Ladder today (T_0)	-.050	-.078
Ladder five years ago (T_{-5})	.046	.068
Ladder five years in future (T_{+5})	.132	-.018
Ladder $T_0 - T_{-5}$	-.071	-.108
	N = 123	N = 153

* equals $p<.05$.

** equals $p<.01$.

independent variable which explains the most variance in the dependent is entered into the equation first. The next variable entered is the one which explains the most variance with the first controlled. This procedure is continued until all variables are entered or until a previously set criterion is reached. The criterion set here is that variables explaining less than one percent of the variance are not entered in the stepwise procedure. The results of this analysis can be found in tables 7.3 and 7.4.

Table 7.3. Stepwise multiple regression of independent variables on EGPCOMP scale, partials, and interrelationships of variables entered for total sample.

			Partial	Zero Order Correlations		
Variable Entered and Controlled	R	R^2	r_{13}	1	2	3
1. EGPCOMP scale	-	-	-	-	.298	-.244
2. Own boat	.298*	.089	-.235		-	-.068
3. Father fisherman	.373*	.139	-			-

N = 123. * equals $p<.01$.

Table 7.4. Stepwise multiple regression of independent variables on EGP1000 scale, partials, and interrelationships of variables entered for total sample.

Variable Entered and Controlled	R	R^2	r_{13}	r_{14}	r_{15}	2	3	4	5
1. EGP1000 scale	-	-	-	-	-	-.306	.184	-.131	-.108
2. Father fisherman	.306*	.094	.163	-.134	-.080	-	-.096	.010	.104
3. Age	.343*	.118	-	-.136	-.083		-	.000	.003
4. Two occupations	.367*	.134		-	-.106			-	-.148
5. Ladder $T_0 - T_{-5}$	.380*	.144			-				-

N = 153.

* equals $p<.01$.

Table 7.3 indicates that boat ownership explains the most variance (8.9 percent) in the EGPCOMP scale. When boat ownership is controlled the relationship between father fisherman and the EGPCOMP scale decreases to -.235, but it still has a stronger relationship with the dependent variable than any of the other variables so it is entered next. Boat ownership and father fisherman combined have a multiple correlation of .373 with the dependent variable, accounting for 13.9 percent of its variance. When these two independent variables are controlled each of the other independent variables account for less than one percent of the variance in the EGPCOMP scale, thus the stepwise procedure is terminated. Table 7.4 is interpreted in a similar manner. Here we find that the four variables entered account for only 14.4 percent of the variance in the EGP1000 scale.

Discussion. Overall, the interrelationships between the independent and dependent variables are disappointingly weak. Additionally, two of the significant correlations are not in the expected direction. For example, Pollnac and Robbins (1972) found a significant negative relationship between age and deferred gratification behavior in Buganda and argue that younger Baganda defer more than older because there is a higher probability that their expectations will be fulfilled. Here we find a significant positive correlation between the EGP1000 scale and age. The correlations presented here and in Pollnac and Robbins (1972) are relatively weak, however, and do little more than add to the research which has indicated either no relationship or an inconsistent one between the two variables (Doob, 1971; Robbins and Thompson, 1974; Pollnac, Gersuny, and Poggie, 1975).

The second finding which is in an unexpected direction is that individuals whose fathers are fishermen are less likely to have deferred orientations than those whose fathers practice other occupations. Pollnac, Gersuny, and Poggie (1975) argue that the periodicity and small-scale entrepreneurship involved in the occupation of fishing results in a deferred orientation. It was therefore expected that individuals who come from a tradition of fishing would be more deferred than other individuals. Here, we find just the opposite (see table 7.2). For both the EGPCOMP and EGP1000 scales, there is a negative relationship between a fisherman father and deferred economic gratification patterns. On retrospect, however, this surprising relationship can be accounted for in the Panamanian context if we take several other variables into consideration. First, Pollnac, Gersuny, and Poggie (1975) compare fishermen to millworkers in New England and argue that fishermen are more deferred because the periodicity of income from fishing is greater than that from millworking; thus fishermen need to have a deferred orientation to efficiently manage their income during slow periods. In Panama, however, 34 percent of the fishermen in our sample come from agricultural backgrounds. Overall, it can be argued that farming has greater periodicity of income than fishing, thus if periodicity is the factor affecting economic gratification patterns, we would expect individuals from agricultural backgrounds to manifest more deferred economic gratification behavior than those from other occupational backgrounds. An examination of the data indicates that 17 percent of the fishermen whose fathers were farmers

give an immediate response to the $1,000 question in contrast to 48 percent of those whose fathers were not farmers. This difference is statistically significant ($x^2 = 13.408$, $\phi = .294$, $p<.001$).

It must be noted, however, that there is an alternative explanation for this unexpected relationship which does not take periodicity into account. When asked what they like most about fishing, the second most important factor mentioned by Panamanian small-scale fishermen is that they can make more money, in less time, than in any other available occupation (see chapter two). It seems, therefore, that the individual from a non-fishing background who becomes a fisherman is upwardly mobile in an economic sense. He has taken a chance and improved his position, thus he may feel that he has more control over his destiny -- a factor related to a deferred orientation (cf. Thompson, 1975). In contrast, fishermen from a fishing family simply follow in the footsteps of their fathers, accepting the path of least resistance, never testing their efficacy. Both the data and the literature provide some support for this alternative explanation. First, coming from a farming background is significantly ($r = .169$ $N = 153$, $p<05$) related to perceived degree of socioeconomic advancement in the last five years (Ladder T_0-T_{-5}). Coming from a fishing background is not related to this variable. Second, Aronoff (1967:44) has suggested that the lack of the psychological ability to plan ahead and save limits the number of Saint Kitts agricultural workers who can become fishermen. This suggests that individuals who go into fishing from an agricultural background have this ability.

Finally, the relationship between control of the means of production (boat ownership) and the EGPCOMP scale was in the expected direction. We had hypothesized that boat ownership would be an indicator of economic security -- a variable found to be related to a deferred gratification orientation (Thompson, 1975). Nevertheless, once again, there is a likely alternative explanation for this relationship. First, Aronoff (1967) has argued that a deferred orientation is necessary to obtain such equipment in the first place. Second, maritime boats and motors need almost continual preventative maintenance as well as periodic repairs which require parts. The boat owner must have a future orientation to take the time to perform the preventative maintenance which, after all, only reduces the chance of the need for a major repair in the future. He also needs a future orientation to put money aside for the periodic repairs which require parts if he wants the least amount of interruption in his future production. Thus boat ownership has three components which may contribute to a deferred orientation.

Overall, the relatively weak relationships between the independent and dependent variables suggest that the data base is too heterogeneous. In the next section we examine the determinants of economic gratification patterns within the three major divisions of the sample.

Study Two: Inter-Group Differences in Correlates of Economic Gratification Patterns

Analysis. As was indicated above, the weak relationships encountered in Study One could be the result of an overly heterogeneous sample. Perhaps the combination of individuals from widely divergent sociocultural matrices weakened or totally obscured significant within group associations between the variables. For example, we may find a negative relationship between two variables in one subsample and a positive in another as a result of varying environmental influences. If the two subsamples are combined, the overall relationship will be substantially weakened, and it will appear that the variables are unrelated. Operating under the assumption that there are significant intergroup differences in the correlates of economic gratification patterns among small-scale fishermen in the Republic of Panama, the total sample was divided into the three subgroups described above: an urban, a rural, and an intermediate. It is suggested that such a division reflects the greatest overall variance with regard to the sociocultural environment of the fishermen. An analysis of variance was conducted comparing the independent variables and the EGPCOMP scale across the three subsamples to partially determine the extent of this variance. The results of this analysis can be found in table 7.5.

Table 7.5. Analysis of variance of dependent and independent variables across the three subsamples.

Variable	Subsample			F Ratio	D.F.		p
	Urban	Intermediate	Rural				
Age	43.70	32.00	35.3	9.639	2	150	<.001
Years fishing	22.00	13.80	14.7	7.978	2	150	<.001
Father farmer	00.10	00.38	00.52	12.092	2	150	<.001
Father fisherman	00.20	00.16	00.24	0.572	2	150	>.05
Income from fishing	106.87	44.61	85.49	3.332	2	124	<.05
Other income	55.06	29.64	22.91	2.165	2	148	>.05
Total income	166.04	75.32	109.76	5.220	2	123	<.01
Own boat	00.42	00.37	00.21	2.862	2	150	>.05
Own house	00.46	00.91	00.81	16.489	2	150	<.001
Material culture scale	3.32	1.89	2.31	6.539	2	150	<.01
Mass media exposure scale	16.02	9.84	8.93	31.607	2	150	<.001
Formal education	5.88	4.78	4.66	5.856	2	150	<.01
Ladder T_{-5}	4.04	3.60	2.93	2.139	2	150	>.05
Ladder T_0	4.82	4.49	4.71	0.144	2	150	>.05
Ladder T_{+5}	8.74	8.97	7.94	2.450	2	125	>.05
Ladder $T_0 - T_{-5}$	0.77	0.89	1.78	1.019	2	150	>.05
Ladder $T_{+5} - T_0$	3.70	4.25	3.00	1.885	2	125	>.05
Ladder $T_{+5} - T_{-5}$	4.81	5.44	5.16	0.341	2	125	>.05
EGPCOMP scale	4.97	5.16	4.46	3.310	2	120	<.05

According to the analysis of variance presented in table 7.5, the three subsamples differ significantly with respect to nine of the independent

variables as well as the EGPCOMP scale. Table 7.5 indicates that the urban sample is the oldest and the intermediate the youngest. The same pattern holds for number of years fishing and is probably due to the strong relationship between age and number of years fishing. A larger percentage of the fishermen in the rural areas have fathers who were farmers than in the urban area -- an expectable difference. The percentage of fishermen whose fathers were fishermen does not significantly differ across the three subsamples. Income from fishing is highest in the urban areas and lowest in the intermediate. Other income does not differ significantly. Total income, however, differs significantly following the same pattern as fishing income. Boat ownership does not differ significantly across the three subsamples, but house ownership does with the largest proportion of house owners in the intermediate area and the lowest in the urban. The material culture scale manifests a pattern which is the inverse of house ownership with the highest values in the urban area and the lowest in the intermediate. Mass media exposure and formal education are highest in the urban area and lowest in the rural. Responses to the ladder of life test did not differ significantly across the three subsamples. Finally, the dependent variable, the EGPCOMP scale, differs significantly across the three areas with the greatest amount of deferred orientation being manifested in the intermediate area and the lowest in the rural. As can be seen in the degrees of freedom column, sample sizes vary across the variables due to missing data. Overall, the three subsamples differ significantly with respect to a substantial proportion of the independent variables. The differences in combination with obvious rural/urban differences (e.g., differences in exposure to a modern urban life style, occupational and educational opportunities, differential distribution of wealth) suggest that there are situational constraints which could result in differential patterning of the determinants of economic gratification orientations.

The interrelationships between the EGPCOMP scale and the independent variables within each of the subsamples can be found in table 7.6.

Total sample size for the EGPCOMP scale is 123, and significance levels take into account changes in sample size due to missing data concerning income and Ladder T_{+5}. This missing data results from the fact that some fishermen claimed they could not remember their income, and others refused to hazard a guess as to where they would stand on the ladder of life five years in the future. It is suggested that refusal to respond to the future component of the ladder test indicates a feeling of lack of control over the future or a fatalistic attitude. This variable was therefore dichotomized with individuals who give a response receiving a value of one and those who refuse to respond a value of zero. This new variable is referred to in table 7.6 as Ladder T_{+5} response.

It is obvious that the situational differences between the three areas of the sample result in differential patterning of the correlates of economic gratification orientations. There are no cases of significant correlations in opposite directions for the same variable, and in instances where the signs do differ, the non-significant correlation is quite weak. This indicates that there are no radical differences in patterning, at least with respect to the zero-order correlations. In

the urban area, age, income from fishing, and several aspects of the ladder of life test are significantly related to the EGPCOMP scale. In the intermediate area, boat ownership and having a father who was a fisherman are significantly correlated with the dependent variable, while in the rural area only fisherman father is significantly related to economic gratification orientations.

Table 7.6. Correlations between the EGPCOMP scale and the independent variables within subsamples.

Variable	Subsample Urban	Intermediate	Rural
1. Age	.330*	.183	.051
2. Years fishing	.238	.013	-.193
3. Father farmer	-.063	.234	.145
4. Father fisherman	.112	-.396*	-.371**
5. Two occupations	.031	-.216	-.167
6. Income from fishing	-.353*	-.058	-.005
7. Other income	.131	-.171	-.136
8. Total income	-.133	.089	-.067
9. Own boat	.243	.425**	.084
10. Own house	.020	.295	.041
11. Material culture scale	.039	.013	-.136
12. Mass media exposure scale	.019	.194	-.167
13. Formal education	-.135	-.019	-.018
14. Ladder T_{-5}	-.255	.084	.180
15. Ladder T_0	.080	-.051	-.054
16. Ladder T_{+5}	.391*	.030	-.014
17. Ladder $T_0 - T_{-5}$	.293	-.084	-.190
18. Ladder $T_{+5} - T_0$	.182	.097	-.059
19. Ladder $T_{+5} - T_{-5}$	.589**	-.007	-.121
20. Ladder T_{+5} response	-.178	.019	-.237

N: Urban = 37, intermediate = 38, rural = 48.

* equals $p < .05$.
** equals $p < .01$.

A stepwise multiple regression analysis, as described in Study One, was performed to determine the interrelationships between some of the independent variables in combination and the EGPCOMP scale within each subsample. The income and Ladder T_{+5} variables (variables 6, 7, 8, 16, 18, and 19 in table 7.6) are eliminated from this analysis due to missing data. The ladder T_{+5} dichotomy (those who responded versus those who refused to respond, table 7.6, variable 20) was included in this analysis however. Once again, entry into the regression equation was restricted to variables which contribute at least one percent of the variance with previously entered variables controlled. The results of these analyses for each of the subsamples can be found in tables 7.7 through 7.9.

Table 7.7. Stepwise multiple regression of independent variables on EGPCOMP scale, partials, and interrelationships of variables entered for urban subsample.

Variable Entered and Controlled	R	R^2	Partial Correlations r_{13}	r_{14}	r_{15}	r_{16}
1. EGPCOMP scale	-	-	-	-	-	-
2. Age	.330[a]	.109	-.408[b]	-.190	.024	.125
3. Ladder T_{-5}	.507[b]	.257		-.347[a]	-.035	.104
4. Ladder T_{+5} response	.589[b]	.346			-.234	.123
5. Two occupations	.618[b]	.382				.179
6. Father fisherman	.634[b]	.402				

Zero Order Correlations

	1	2	3	4	5	6
1. EGPCOMP scale	-	.330[a]	-.225	-.178	.031	.112
2. Age		-	.331[a]	.007	.025	-.019
3. Ladder T_{-5}			-	-.259	-.120	-.076
4. Ladder T_{+5} response				-	-.402[a]	.053
5. Two occupations					-	.169
6. Father fisherman						-

N = 37.

[a] equals $p < .05$.
[b] equals $p < .01$.

Table 7.8. Stepwise multiple regression of independent variables on EGPCOMP scale, partials, and interrelationships of variables entered for intermediate subsample.

Variable Entered and Controlled	R	R^2	Partial Correlations r_{13}	r_{14}	r_{15}	r_{16}	r_{17}	r_{18}
1. EGPCOMP scale	-	-	-	-	-	-	-	-
2. Own boat	.425[b]	.180	-.421[b]	.251	.361[a]	-.153	.174	.168
3. Father fisherman	.570[b]	.325		.358[a]	.303[a]	-.192	.141	.122
4. Ladder T_{+5} response	.642[b]	.412			.320[a]	-.170	.139	.137
5. Own house	.687[b]	.472				-.136	.105	.109
6. Two occupations	.694[b]	.482					.148	.128
7. Age	.702[b]	.493						.135
8. Mass media exposure scale	.709[b]	.502						

	Zero Order Correlations 1	2	3	4	5	6	7	8
1. EGPCOMP scale	-	.425[b]	-.396[b]	.019	.295	-.216	.183	.194
2. Own boat		-	-.037	-.437[b]	-.074	-.188	.060	.100
3. Father fisherman			-	.163	-.218	-.040	-.113	-.142
4. Ladder T_{+5} response				-	.011	-.006	-.014	-.077
5. Own house					-	-.103	.142	.124
6. Two occupations						-	.225	.092
7. Age							-	.029
8. Mass media exposure scale								-

N = 38.

[a] equals $p<.05$.
[b] equals $p<.01$.

Table 7.9. Stepwise multiple regression of independent variables on EGPCOMP scale, partials, and interrelationships of variables entered for rural subsample.

Variable Entered and Controlled	R	R^2	Partial Correlations r_{13}	r_{14}	r_{15}	r_{16}	r_{17}	r_{18}
1. EGPCOMP scale	-	-	-	-	-	-	-	-
2. Father fisherman	.371[b]	.138	.290[a]	-.247	.121	-.098	-.138	.136
3. Ladder T_{-5}	.459[b]	.210		-.210	.150	-.207	-.176	.190
4. Ladder T_{+5} response	.495[b]	.245			.205	-.203	-.138	.164
5. Material culture scale	.526[b]	.277				-.242	-.208	.108
6. Mass media exposure scale	.565[b]	.319					-.229	.112
7. Two occupations	.596[b]	.355						.146
8. Own house	.607[b]	.369						

	Zero Order Correlations 1	2	3	4	5	6	7	8
1. EGPCOMP scale	-	-.371[b]	.180	-.237	-.136	-.167	-.167	.041
2. Father fisherman		-	.223	.021	.607[b]	.209	.104	-.221
3. Ladder T_{-5}			-	-.159	.076	.344[a]	.121	-.095
4. Ladder T_{+5} response				-	.192	-.008	.188	-.111
5. Material culture scale					-	.225	.303[a]	.350[a]
6. Mass media exposure scale						-	.050	.042
7. Two occupations							-	.166
8. Own house								-

N = 48.

[a] equals $p<.05$.
[b] equals $p<.01$.

In the urban area five of the independent variables account for 40 percent of the variance in the EGPCOMP scale. In the intermediate area seven account for 50 percent, and in the rural seven account for 37 percent. Overall, these results are a great deal stronger than those reported for Study One and justify division of the sample into three subsamples.

Discussion. The urban subsample manifests a strong positive relationship between perceived socioeconomic position five years in the future and the EGPCOMP scale. The relationship between economic gratification orientations and the perceived distance between socioeconomic position five years in the past and five years in the future is even stronger. Overall, the relationship with the ladder of life test indicates that the more deferred an individual is, the lower he will evaluate his socioeconomic position five years ago, the larger the perceived progress from five years ago to five years in the future, and the more optimistic he is concerning the future.

In light of Thompson's (1975) research, it is significant that these strong correlations occur only in the urban area. Thompson constructed an optimism-efficacy index which included a question concerning an individuals's perception of his future status relative to his present status. His measure is therefore related to the ladder test used here. Thompson's optimism-efficacy index was significantly correlated with the gratification orientation index only within his urban sample ($r = .332$, $N = 100$, $p<.001$). The fact that both his study and ours find strong zero-order correlations with optimism only in the urban area is extremely interesting. Thompson argues that deferred gratification is an unattractive strategy in the urban area in Uganda due to ambiguities and uncertainties concerning social status and the general insecurity of the urban environment. The relationship between optimism-efficacy and gratification patterns in the urban area leads him to suggest that "...urbanites are more likely to adopt a strategy of delayed gratification when they perceive that their efforts will be rewarded and they have achieved a measure of optimism with regard to future outcomes" (1975:204). His argument is supported by the fact that urban residence is negatively related to deferred gratification orientations.

It can be argued that the Panamanian urban sample is also subject to a certain amount of insecurity and external control. Seventy-two percent of the urban sample live in La Playita, Colon. When interviews were conducted in this community, the people were in a state of anxiety due to a rumor circulating concerning construction of a new boulevard which would force destruction of their community, and result in their being moved to a new location. Fishermen complained of being required to learn new fishing areas, of being too far from consumers, and of the overall disruption caused by the projected move. This is a good example of uncertainty caused by forces beyond the control of the population. Conditions such as these did not exist in any other section of the sample, nevertheless, the urban sample is intermediate with respect to a deferred orientation -- the rural sample is less deferred and the intermediate more (see table 7.5). It is also important to note that the urban sample is intermediate with respect to optimism as measured

by the ladder test. Nevertheless, the strong positive relationship between degree of optimism and deferred gratification orientations in urban areas in both Panama and Uganda suggest that in situations characterized by uncertainty, one must be optimistic in order to view a deferred orientation as a realistic behavioral alternative. Perhaps the relatively high degree of optimism and deferred orientation in the urban area in Panama can be attributed to the fact that the Panamanian social environment is overall more predictable, progressive, and oriented toward general human welfare than that of Uganda at the time Thompson conducted his research.

The strong negative relationship between income from fishing and the EGPCOMP scale in the urban area is rather surprising. It was assumed that individuals with the most economic access would be most likely to defer since those with limited access can least afford to defer gratification (Rodgers, 1967; Pollnac and Robbins, 1972). These findings, however, suggest that those with the highest incomes are already economically secure; thus extra money can be safely expended on luxury items. The fact that this strong relationship was found only in the urban area can probably be explained by the fact that luxury items are more salient in the cities, being on display in numerous shops, etc. Further, several investigators report that reward salience is negatively associated with deferred gratification behavior (e.g., Mischel, Ebbesen, and Zeiss, 1972; Robbins and Thompson, 1974). These interpretations are supported by close examination of the separate components of the EGPCOMP scale. It can be argued that perception of a sum of money as something to be invested in a situation of high reward salience will be related to its relative amount in comparison to the amount the individual customarily manages. As these two sums approximate each other, the individual will be less likely to perceive the additional funds as an amount worthy of investment. If these assumptions are correct, it is expected that income from fishing will be more strongly related to the EGP200 scale than the EGP1000 scale. Mean income from fishing in the urban area was $106.87 for the month preceding the interview (see table 7.5). Eight fishermen reported an income of $200 or more indicating that $200 is probably not viewed as an unusually large amount of money by urban fishermen. The analysis of this data indicate that the relationship between income from fishing and the EGP200 scale is in fact strongly negative ($r = -.453$, $N = 37$, $p < .01$) while its relationship with the EGP1000 scale is close to zero ($r = -.007$, $N = 45$, $p > .05$). Thus, the strong negative relationship between income from fishing and the EGPCOMP scale can be attributed to its EGP200 component, the high degree of reward salience in the urban area, and the degree to which $200 is perceived as an amount worthy of investment.

It is difficult to interpret the positive relationship between age and the EGPCOMP scale in the urban area. The conflicting results concerning the interrelationships between these two variables which appear in the literature are discussed above. Nevertheless, this relationship can be interpreted if it is assumed that older individuals in the urban area are more secure and less subject to a situation of high reward salience. Older fishermen have had more time to acquire equipment and their maturity probably makes them less susceptible to impulse buying in a situation where luxury items are quite salient. These assumptions are borne

out by a within urban subsample correlation analysis which indicates that older individuals have been fishing longer ($r = .417$, $N = 50$, $p<.01$), are more likely to own their own boat ($r = .408$, $N = 50$, $p<.01$), are more optimistic about their future status ($r = .420$, $N = 43$, $p<.01$), and more likely to own their own home ($r = .397$, $N = 50$, $p<.01$), all indicating a degree of security. Age also has a strong positive relationship with the EGP200 scale ($r = .391$, $N = 37$, $p<.01$), indicating less of a tendency for small-item impulse buying among older fishermen. Additionally, older individuals possess less items on the material culture scale ($r = -.473$, $N = 50$, $p<.01$), suggesting that they are less likely to spend money on household luxuries -- remember, however, that it was indicated above that they tend to own their own houses and boats. It thus appears that the positive relationship between age and the EGPCOMP scale in the urban area can be explained by the fact that older fishermen are more secure and less subject to reward salience than younger fishermen.

Turning to the multiple regression analysis, six of the independent variables explain 40 percent of the variance in the EGPCOMP scale. Zero-order and partial correlations will be examined in an attempt to account for this strong multiple correlation. Only statistically significant partials will be examined to preclude the possibility of attempting to explain a chance deviation from a correlation of zero. The relationship between age and the EGPCOMP scale was discussed above. When the effects of age are partialled out, the relationship between the EGPCOMP scale and Ladder T_{-5} increases to -.408. This indicates that after the effects of age on the EGPCOMP scale are removed, the individual's perception of his socioeconomic position five years in the past accounts for a significant amount of the residual variation. The partial correlation is negative indicating that the higher one perceives his past socioeconomic position, the less deferred he is. This along with the positive correlation between perceived socioeconomic progress from five years in the past to five years in the future discussed above suggest that it is amount of perceived socioeconomic progress which is strongly related to gratification orientations. Those who perceive themselves as being relatively high in the past would manifest less progression to the present and the future, thus explaining the strong negative relationship. When the effects of the first two variables entered are controlled, the partial correlation between the EGPCOMP scale and the Ladder T_{+5} response dichotomy increases to a significant level. The surprising factor is that it is in a negative direction indicating that with the first two variables controlled, those who are deferred are <u>less</u> likely to hazard a guess concerning their future status. It was assumed that refusal to predict future status would be an indicator of a fatalistic, non-efficacious attitude toward the future which would not be conducive to a deferred gratification orientation. The finding here is the opposite of that expectation, and we can offer no explanation at the present time. Nevertheless, the three variables entered on the basis of significant partial correlations account for 35 percent of the variance in the EGPCOMP scale, a modest, but very respectable amount.

<u>The intermediate subsample</u> manifests a different pattern of interrelationships than the urban subsample. Here, fisherman father is nega-

tively and boat ownership positively related to the EGPCOMP scale. Both of these relationships were discussed above in Study One. Briefly, it was argued that if it is the periodicity factor affecting gratification orientations, those from farming backgrounds, where periodicity of production is greater than in fishing, would be more deferred. It was also argued that fishermen view their occupation as economically attractive, thus suggesting that those who change their occupation to fishing are upwardly mobile and have demonstrated that they are able to control their destiny, a factor favorable to a deferred orientation, while those who follow in their father's footsteps are maintaining the status quo -- never testing themselves. In the intermediate sample, a larger proportion of the fishermen come from agricultural backgrounds (see table 7.5), suggesting a greater potential for upward mobility. Only 10 percent of the urban fishermen have fathers who farmed. Additionally, many of the other occupations listed for fishermen's fathers in the urban area suggest that some of the present-day fishermen are in fact downwardly mobile -- a state of affairs not conducive to a deferred gratification orientation. Thus, differential distributions of fathers' occupations may account for differences in relationships between the two variables in the two areas. With regard to boat ownership, it was argued above that ownership of the means of production results in economic security which facilitates a deferred orientation -- alternately, it takes a deferred orientation to accumulate the funds to purchase a boat and provide it with proper maintenance.

Turning to the multiple regression, we find that seven of the independent variables account for 50 percent of the variance in the EGPCOMP scale. Concentrating on variables whose before-entry partial correlations are statistically significant, we find that they explain 47 percent of the variance in the dependent variable. The dependent variable's relationship with boat ownership and fisherman father have been discussed above. However, it is interesting to note that after the effects of these two variables have been removed, the amount of variance in the residual which is accounted for by the Ladder T_{+5} response dichotomy increases to a significant amount. What is even more interesting is the fact that the partial correlation is in a positive direction -- the direction we predicted and opposite to that found in the urban area. It thus seems that in the intermediate sample, refusal to predict future status on the ladder diagram -- a potential indicator of a fatalistic, non-efficacious attitude -- is related to an immediate gratification orientation. We cannot explain why we found the predicted relationship in the intermediate and not in the urban sample. Finally, house ownership manifested a significant positive partial correlation from the time that boat ownership was entered into the multiple correlation. The relationship is in the expected direction -- house ownership probably enhances individual economic security, thus favoring a deferred orientation.

The rural subsample analysis indicates that only one independent variable has a statistically significant zero-order correlation with the EGPCOMP scale -- fisherman father. The negative relationship between fisherman father and the EGPCOMP scale has been thoroughly discussed above. Once again, differential distribution of occupations may account

for the significance of this correlation in the rural area as contrasted to the urban.

Turning to the stepwise multiple regression analysis, only two variables have statistically significant zero-order or partial correlations with the dependent variable -- father fisherman and socioeconomic position five years in the past. In the rural subsample, however, the Ladder T_{-5} partial correlation indicates a positive relationship with the EGPCOMP scale. In the urban sample, it was negative. With regard to the urban sample, we argued that the negative relationship is due to the fact that perceived progress is the important correlate of deferred gratification orientations. Table 7.6 indicates that in the rural sample, perceived progress is negatively related to the EGPCOMP scale. None of these negative correlations reach statistical significance, but in combination they suggest that their direction might be correct. The relative weakness of these correlations, however, suggests that speculation as to their determinants would be premature. Overall, the determinants of economic gratification patterns are less clear in the rural subsample than in the other two subsamples.

Conclusions

In general, our findings indicate a strong situational component influencing differential patterning of determinants of gratification patterns. Periodicity, relative security, and optimism are proposed as general factors influencing gratification orientations among small-scale fishermen in the Republic of Panama. Subsample differences indicate that perceived socioeconomic progress, age, and income from fishing are important variables in the urban area; boat ownership in the intermediate area; and having a fisherman father in both the intermediate and rural areas. Some differences in the patterning of these variables are explained on the basis of variability in relative security, reward salience, and occupational structure. Several of the alternative explanations of surprising relationships between the variables, although plausible, are after-the-fact and therefore need further testing. Nevertheless, it should be noted that much of the satisfaction and some of the frustration of scientific research is encountered in surprising relationships which force the investigator to speculate, reconsider, and reformulate theory and method -- a process which has been referred to as abductive hypothesis generation, and one which results in increasingly law-like statements about the phenomena under investigation (cf. Pollnac and Hickman, 1975).

The importance of situational constraints with respect to the determinants of gratification orientations have been emphasized in several studies (Robbins and Thompson, 1974; Thompson, 1975). The results presented here emphasize the fact that in order to understand the multiple determinants of this important variable in the developmental process in any one region, sub-regional variation with respect to the sociocultural environment must be taken into account. It cannot be assumed that fishermen from one area will respond to increased wealth in the same manner as those from other areas. If development funds are injected into a

region with the goal of sustained development through reinvestment of reasonable amounts of profit, then situational determinants of deferred gratification are of utmost significance. Part of the developmental scheme should be involved with creating environments favorable to deferred orientations. Additionally, Robbins and Thompson (1974) argue the importance of constantly monitoring the manner in which such new opportunities are perceived by members of the local population. Such monitoring would reveal a great deal about the variance in success of such programs.

CHAPTER EIGHT

BELIEFS CONCERNING FAILURE TO REPAY LOANS AMONG SMALL-SCALE FISHERMEN IN THE REPUBLIC OF PANAMA

Richard B. Pollnac and Roberto Ruiz-Stout

Introduction

Credit is often necessary for small-scale producers. This is especially true among small-scale ocean fishermen whose productive equipment (e.g., boats, nets, motors) often requires a substantial investment. Fishing equipment is frequently subject to breakdown or loss due to the severe conditions imposed on it by the sea, and continued production may require obtaining credit for repair or replacement. Further, the periodic nature of the resource (i.e., fishing may be good for a day or two and then poor for several weeks or more) often requires some sort of credit to sustain the fisherman and his family through less productive periods (cf. Pollnac, 1976). Traditionally, local moneylenders and middlemen would provide these credit services for the small-scale fisherman. Today, however, governments are playing an increasing role in providing credit to small-scale producers. Often this credit is funneled through local institutions, such as development banks or cooperative organizations.

A recent survey of the efficacy of cooperative credit notes that while small-scale producers often complain of insufficient credit, those in charge of credit programs complain of inadequate repayment (UNRISD, 1975). This same study provides many examples of both the inadequacy and misuse of cooperative credit funds. Problems frequently cited include application of funds to unproductive purposes and low levels of repayment.

As noted in an earlier chapter, many Panamanian small-scale fishermen perceive the fishermen's cooperative as being a source of funds (credit). Several precooperatives and cooperatives, however, fell into difficulty when either they or their members failed to repay loans. It is suggested here that an understanding of the fishermen's perceptions of problems associated with loan repayment may be of assistance in formulating educational programs associated with credit schemes or in the reformulation of credit programs to better fit the needs of fishermen.

As a means of gaining an understanding of the small-scale fisherman's perceptions of loan repayment, an open-ended question was asked during the survey concerning factors resulting in default on loans. The remainder of this chapter deals with responses to this question.

Analysis and Discussion

Responses to the question concerning why some people fail to repay loans could be classified into three major categories: (1) forces beyond control of debtor; (2) personal faults of debtor; (3) do not know. Responses such as "bad situation will not let them"; "they have bad luck and fail in project"; "their catch is not enough for home consumption," etc., were classified into the first category. The second category, personal faults of debtor, contains responses such as "they waste their money"; "they are irresponsible"; "they are negligent," etc. Thirty-three percent of the responses fell in the first category, 58 percent in the second, and nine percent into the third.[1]

High frequency response categories (categories one and two) were cross-tabulated with a number of other variables to determine the correlates of the various responses. The results of this analysis can be found in table 8.1.

Table 8.1. Beliefs concerning failure to repay debts cross-tabulated with selected variables.

Variable	Beyond control	Personal faults	x^2	p
Age ≥ 40 years	39	36	0.148	>.10**
Cooperative/precooperative member	35	53	3.999	<.05**
Do not know benefits of cooperative	51	35	3.503	<.10**
Deferred ($200 question)	56	71	2.672	<.10*
Deferred ($1,000 question)	59	69	1.345	>.10*
Education ≥ 6 years	51	55	0.217	>.10**
Fisherman father	12	24	2.915	<.10**
Urban residence	27	31	0.248	>.10**
Read at least one newspaper per week	57	54	0.112	>.10**

N = 140.
*One-tailed test.
**Two-tailed test.

The tabular entries in table 8.1 indicate the percentage of the individuals included in each response category who manifest the indicated variable. For example, 39 percent of the individuals whose responses were categorized as "forces beyond control of debtor" were 40 years of age or older. The statistical analysis of the age variable ($x^2 = 0.148$, $p > .10$) indicates that age seems to have no influence on beliefs concerning failure to repay debts. The probability that the differences in percentage could have occurred by chance alone is greater than one in ten.

[1]Total less than 100 percent due to rounding.

It appears, however, that cooperative/precooperative members are less likely than non-members to attribute failure to repay debts to forces beyond control of the debtor. Only 35 percent of the fishermen providing this response were members. The rest (65 percent) were non-members. There is also a weak tendency for those who know the benefits of a cooperative to attribute default to personal characteristics.

It was noted in the previous chapter that individuals who feel that they have more control over their destiny, who are more efficacious, are more likely to have a deferred orientation. We therefore expected that deferred individuals would be less likely to attribute default on loans to factors beyond the control of the individual. This hypothesis is weakly supported with regard to the $200 question (see previous chapter for a discussion of this variable). Thirty-one percent of the fishermen with a deferred orientation attribute default to forces beyond control of the debtor in contrast to 46 percent of the immediate. However, the $1,000 question does not support this hypothesis. In general, there seems to be little or no relationship between the selected variables and beliefs concerning reasons for default.

Conclusion

In sum, we find that the majority of small-scale fishermen attribute failure to repay loans to personal faults of debtors. A substantial number (one-third), however, feel that default is usually due to circumstances beyond control of the borrower. There appears to be a weak tendency for non-cooperative/precooperative members, individuals who do not know the benefits of belonging to a cooperative, immediate gratifiers, and individuals whose fathers were not fishermen to attribute default to forces beyond the control of the debtor.

CHAPTER NINE

CONCLUSIONS

The preceding chapters have provided us with a partial but useful description of selected aspects of small-scale fishermen of Panama. We found that in general the Panamanian small-scale fisherman has a relatively positive attitude towards his occupation, and that about 50 percent look favorably upon their sons becoming fishermen like themselves. The relatively high income, sporting aspect, and independent nature of fishing all contribute toward the fisherman's high regard for his occupation and suggest that today it would be difficult to convince many fishermen that an alternative occupation could be as rewarding. The findings, however, indicated that through time fishermen's attitudes toward fishing may become more negative, and it was suggested that changes in the industry which would reduce negative and enhance positive aspects of fishing may reverse the trend.

We also found that kinship appears to play a moderately important role among small-scale fishermen in Panama, especially in the more rural areas. Kinship was found to be a factor in both recruitment to the occupation and crew structure, thus suggesting that it is an important element to be considered in any changes in the industry which would affect crew structure or entry into the occupation. Economic studies of the small-scale fishery should also take this factor into consideration.

Several sections of this report dealt with fishermen's cooperative organizations. The first, which was concerned with fishermen's perceptions of cooperative organizations, found that although there was some agreement concerning the idea of cooperatives, there was a great deal of variability in knowledge concerning their benefits and functions. Correlates of this variability were examined, and it was found that formal education, as mediated by mass media exposure, contributed to knowledge about cooperative organizations. It was suggested that the amount of variability concerning benefits and functions of cooperative organizations could lead to problems in development and operation due to varying expectations on the part of participants and that educational programs should be developed to correct this problem.

Correlations of cooperative/precooperative membership were examined and it was found that formal education, as mediated by mass media exposure and knowledge about cooperatives, was positively related to cooperative/precooperative membership. It was noted that cooperatives provide essential marketing services as well as equipment, but the relationship between individual equipment and cooperative/precooperative membership was ambiguous. There was some indication that cooperative/precooperative

members enjoy a slightly better material style of life and that they were overall more positive toward their occupation. The proposition that a cooperative functions to deal with the uncertainties of the fisherman's occupational life was supported, and we found that cooperative/precooperative members are more optimistic about attaining the best possible life than non-members. Overall, the findings suggested that these organizations have no negative effect on fishermen, and that, in general, the effects seem to be positive.

Injection of development funds into a region with the goal of sustained development through reinvestment of reasonable amounts of profit requires a deferred gratification orientation on the part of recipients. It was found that, in general, the Panamanian small-scale fisherman will invest excess funds into productive equipment; nevertheless, situational components resulted in a differential patterning of this orientation. Subsample differences indicated that perceived socioeconomic progress, age, and income from fishing are important determinants in the urban area, boat ownership in the intermediate areas, and having a fisherman father in both the intermediate and rural areas. Differences in the patterning of these variables were partially explained on the basis of variability in relative security, reward salience, and occupational structure. The results suggested that injection of development funds would have varying consequences across the different regions, and that part of the development scheme should be involved with creation of environments favorable to deferred orientations.

Finally, turning to credit, which is an important element among small-scale producers and usually forms an essential ingredient in development programs, we found that the majority of small-scale fishermen attribute default to personal failings. Nevertheless, one-third of the fishermen feel that failure to repay loans is due to circumstances beyond control of the borrower. We found, however, that those who attribute default to forces beyond control of the debtor are usually non-cooperative/precooperative members, individuals who do not know the benefits of belonging to a cooperative, immediate gratifiers, and individuals whose fathers were not fishermen.

Overall, the papers present information which increases our understanding of the Panamanian small-scale fisherman and suggests elements which could have some impact on the ongoing development of the fishery. Several sections of the report deal directly with aspects of the fishery which were suggested as important in Panama in a 1975 seminar-workshop (Arellano-Lennox, 1976). In concluding his seminar paper, Arellano-Lennox said that "...technical experts who come to underdeveloped countries should understand the socioeconomic conditions and provide services that meet these realities" (1976:84). It is hoped that this report is a step in the direction of meeting this request.

Arellano-Lennox, Carlos. "Artisan Fisheries of Panama." In T. S. Estes, ed., Proceedings of the Seminar-Workshop on Artisan Fisheries Development and Aquaculture in Central America and Panama (Kingston, RI: University of Rhode Island, 1976).

Aronoff, J. Psychological Needs and Cultural Systems (Princeton: Van Nostrand and Company, 1967).

Blalock, Hubert M. Causal Inferences in Nonexperimental Research (Chapel Hill: University of North Carolina Press, 1964).

Blehr, O. "Action Groups in a Society with Bilateral Kinship: A Case Study from the Faroe Islands," Ethnology, 2:269-275 (1963).

Cantril, H. "A Study of Aspirations," Scientific American, 108:41-45 (1963).

Diamond, Norma. K'un Shen: A Taiwan Village (New York: Holt, Rinehart and Winston, 1969).

Doob, L. Becoming More Civilized (New Haven: Yale University Press, 1960).

_____. Patterning of Time (New Haven: Yale University Press, 1971).

Dundes, A. "Thinking Ahead: A Forkloristic Reflection of the Future Orientation in American World View," Anthropological Quarterly, 42:53-72 (1969).

Food and Agriculture Organization of the United Nations. Manual on Fishermen's Cooperatives (Rome: 1971).

Firth, Raymond. Malay Fishermen, 2nd ed. (Hamden, Connecticut: Archon Books, 1966).

_____. Primitive Polynesian Economy (London: Routledge and K. Paul, 1965).

Foster, George M. Traditional Societies and Technological Change, 2nd ed. (New York: Harper and Row Publishers, 1973).

Fraser, Thomas M. Fishermen of South Thailand (New York: Holt, Rinehart, and Winston, Inc., 1966).

Fuguitt, G. "The Growth and Decline of Small Towns as a Probability Process," American Sociological Review, 30:403-411 (1965).

Gersuny, Carl and John J. Poggie. "A Fishermen's Cooperative: Open System Theory Applied," Maritime Studies and Management, 1:215-222 (1974).

_____. "The Uncertain Future of Fishing Families," The Family Coordinator, 241-244 (April 1973).

Glacken, Clarence J. The Great Loochoo (Berkeley: University of California Press, 1955).

Gladwin, Hugh. "Decision Making in the Cape Coast (Fante) Fishing and Fish Marketing System." Ph.D. dissertation, Stanford University, 1970.

Gold, D. "Psychological Changes Associated with Acculturation of Saskatchewan Indians," The Journal of Social Psychology, 71:177-184 (1967).

Graves, T. "Alternative Models for the Study of Urban Migration," Human Organization, 25:295-299 (1966).

_____. "Psychological Acculturation in a Tri-ethnic Community," Southwestern Journal of Anthropology, 23:337-350 (1967).

Inkles, A. "Making Men Modern: On the Causes and Consequences of Individual Change in Six Developing Countries," American Journal of Sociology, 75:208-225 (1969).

Kemeny, J. and L. Snell. Finite Markov Chains (New York: Van Nostrand, 1960).

_____ and G. Thompson. Introduction to Finite Mathematics, 3rd ed. (Englewood Cliffs: Prentice-Hall, 1974).

Knudson, Kenneth E. "Resource Fluctuation, Productivity, and Social Organization on Micronesian Coral Islands." Ph.D. dissertation, University of Oregon, 1970.

Lessa, William A. Ulithi: A Micronesian Design for Living (New York: Holt, Rinehart, and Winston, Inc., 1966).

Lessing, E. "Demographic, Developmental, and Personality Correlates of Length of Future Time Perspective (FTP)," Journal of Personality, 36:183-201 (1968).

Levine, Robert A. Culture, Behavior and Personality (Chicago: Aldine Publishing Co., 1973).

Liguori, V.A. "Stability and Change in the Social Structure of Atlantic Coast Commercial Fisheries." Ph.D. dissertation, Princeton University, 1968.

Meade, R. "Future Time Perspectives of College Students in America and India," Journal of Social Psychology, 83:175-182 (1971).

Mischel, W., E. Ebbesen, and A. Zeiss. "Cognitive and Attentional Mechanisms in Delay of Gratification," Journal of Personality and Social Psychology, 21:204-218 (1972).

Mischel, W. and R. Metzner. "Preference for Delayed Reward as a Function of Age, Intelligence, and Length of Delay Interval," Journal of Abnormal and Social Psychology, 64:424-431 (1962).

Morss, Elliott R., et al. Strategies for Small Farmer Development, Volumes I and II (Boulder, Colorado: Westview Press, 1976).

Norr, Kathleen. "A South Indian Fishing Village in Comparative Perspective." Ph.D. dissertation, University of Michigan, 1972.

_____ and James L. Norr. "Environmental and Technical Factors Influencing Power in Work Organizations: Ocean Fishing in Peasant Societies," Sociology of Work and Occupations, 1:219-251 (1974).

Pollnac, Richard B. Continuity and Change in Marine Fishing Communities, A State-of-Art Paper prepared for U.S.A.I.D. Anthropology Working Paper 10 (University of Rhode Island, 1976).

_____. Kinship Links among Small-Scale Fishermen in the Gulf of Nicoya, Costa Rica. Anthropology Working Paper 17 (University of Rhode Island, 1977).

_____, Carl Gersuny, and John J. Poggie. "Economic Gratification Patterns of Fishermen and Millworkers in New England," Human Organization, 34:1-7 (1975).

_____ and J. Hickman. "Abduction and Statistical Inference of Interaction Patterns," Sociologus, 25:28-61 (1975).

_____ and John J. Poggie. "Economic Gratification Orientations among Small-Scale Fishermen in Panama and Puerto Rico," paper delivered at the Applied Anthropology Meetings (St. Louis, 1976).

_____ and M. Robbins. "Gratification Patterns and Modernization in Rural Buganda," Human Organization, 31:63-72 (1972).

Powell, Francis D. Theory of Coping Systems (Cambridge, Massachusetts: Schenkman Publishing Co., 1975).

Proskie, J. and J. C. Adams. Survey of the Labour Force in the Offshore Fishing Fleet - Atlantic Coast (Ottawa: Department of Fisheries and Forestry, 1969).

Quinn, Naomi R. "Mfantese Fishing Crew Composition: A Decision Making Analysis." Ph.D. dissertation, Stanford University, 1971.

Robbins, M. and R. Thompson. "Gratification Orientations and Individual Modernization in Buganda." In: J. Poggie and R. Lynch, eds., Rethinking Modernization (Westport, Connecticut: Greenwood Press, 1974), 234-291.

Rodgers, W. "Changing Gratification Orientations: Some Findings from the Out-Island Bahamas," Human Organization, 16:200-205 (1967).

Rogers, E. Modernization Among Peasants (New York: Holt, Rinehart, and Winston, Inc., 1969).

Rogers, Everett M. and F. Shoemaker. Communication of Innovations, 2nd ed. (New York: The Free Press, 1971).

Rosen, B. "Industrialization, Personality and Social Mobility in Brazil,' Human Organization, 30:131-148 (1971).

Sabella, James C. "The Fishermen of Caleta San Pablo." Ph.D. dissertation, Cornell University, 1974.

Sahlins, Marshall D. Moala: Culture and Nature on a Fijian Island (Ann Arbor: University of Michigan Press, 1962).

Thompson, James D. Organizations in Action (New York: McGraw-Hill Book Co., 1967).

Thompson, R. "Gratification Patterns in Buganda: An Explanation of Intracultural Diversity," American Ethnologist, 2:193-206 (1975).

Turner, J. "Patterns of Value Change During Economic Development: An Empirical Study," Human Organization, 30:126-136 (1971).

United Nations Research Institute for Social Development. Rural Cooperatives as Agents of Change: A Research Report and a Debate (Geneva: 1975).

Weber, M. The Protestant Ethic and the Spirit of Capitalism (New York: Scribner's, 1930).

White, D. "Mathematical Anthropology." In: J. Honigmann, ed., Handbook of Social and Cultural Anthropology (Chicago: Rand McNally, 1974), 369-446.

Wober, M. and F. Musoke-Mutanda. Candy, Canes and Chronometry Among Ugandan School-Children. Occasional Paper 4, Department of Sociology, Makerere University (Kampala, 1971).