

Happiness, Well-being and Psychocultural Adaptation to the Stresses Associated with Marine Fishing

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Abstract

The purpose of this paper is to develop a heuristic model to account for the attachment that many particularly successful fishermen seem to have to their occupation. It is argued here that the relatively risky nature of the occupation of fishing attracts and holds individuals manifesting an active, adventurous, aggressive, and courageous personality; hence, these risky components of the job have a positive influence on their levels of happiness. There is more to fishing than money. What other occupation is reflected in a popular recreational activity like marine sport fishing? It takes one into a different environment, away from shore-based activities and allows participants to become involved in the thrill of the hunt, pitting ones' luck and skill against others as well as against elusive prey hidden beneath the water. As a consequence, some fishermen resist leaving the occupation even when economic returns suggest they should.

The paper first develops a heuristic human ecology model that illustrates relationships between aspects of the physical, political, and social environments that generate stress among commercial fishermen. The model is then elaborated to include psychological, biobehavioral, technological, ideological and social adaptations that mediate between the stress causing variables and the individual fisherman, reducing or eliminating the stress. A possible genetic component is also discussed. The model is discussed in terms of its application to fisheries management in New England and elsewhere.

Keywords: *fishing, job satisfaction, happiness, fishery management*

Introduction

The purpose of this paper is to develop a heuristic model to account for the attachment that many particularly successful fishermen seem to have to their occupation. Many attempts to reduce pressures on the resource by providing alternative sources of income for fishermen have been stymied by this seemingly irrational attachment. For example, it was reported that some fishermen in Nova Scotia were reluctant to sign up for government assistance during a fishery closure because it would require them to give up their licenses (Binkley 2000). Tango-Lowy and Robertson (2002) found that less than one-third (28%) of commercial fishermen interviewed said they were willing to participate in open-ocean aquaculture—an occupation one would expect to provide some of the same satisfactions as the capture fishery. Fishing vessel buyback programs, aimed at reducing pressure in the fishery while providing fishermen with money to shift occupations also fall victim to fishermen's reluctance to leave fishing. For example, the General Accounting Office estimated in 2000 that some 30% of the participants used the money they received for their boats to buy new boats and equipment (UPI 2001). The same report cited a New Bedford fisherman member of the New Bedford Fishermen's Family Assistance Center as saying that the buyback program actually provided some fishermen with the means to upgrade their fishing operations. Some also used the money to buy fishing permits (Van Zile 2001). Similar responses have been reported for the West Coast (Chambers 2004).

This attachment to the occupation is also found among small-scale fishermen in developing country contexts. For example, Pollnac et al. (2001) have reported a similar reluctance to change occupation among Southeast Asian fishermen. They cite numerous alternative income project failures and present evidence indicating that, contrary to the expecta-

tion of fisheries managers, fishermen are not likely to be interested in alternative employment. They point out that fishermen interviewed in the Philippines, Indonesia and Vietnam like their occupation so much that only a minority would change to another occupation, with similar income, if it were available (Pollnac et al. 2001, 541). Further evidence that the attachment to fishing is not confined to modern, Western economies is provided by Sievanen et al. (2005) who present evidence that contradicts the assumption that as fishermen engage in more lucrative livelihoods, such as seaweed farming, pressure will be reduced on the fisheries. It concludes that in some cases seaweed farming has somewhat reduced certain types of fishing activities, but in others, the fishermen's family members performed most of the day-to-day labor on the seaweed plantings while the adult males continued to fish. Similarly, research conducted in 31 coastal communities in the insular Pacific indicated that alternative income producing programs failed to reduce fishing pressure (World Bank 2000). Examples of reversions back to fishing after temporarily switching to alternative livelihoods in developing countries are provided by Pomeroy (1992) and Smith and Smith (1980).

Why are fishermen so attached to fishing that they are reluctant to change occupation? They must like their occupation—it must make them happy, but given the apparently negative aspects of their job, this seems hardly rational. Fishing is dangerous—the fishery ranks among the most dangerous occupations (e.g., for the USA, Canada and Great Britain see Pollnac et al. 1998; Binkley 1995; and Thompson et al. 1983, respectively). These dangers are not confined to large scale, cold water fisheries—there is growing evidence of high accident rates among tropical, small-scale fishermen as well (see Walton 1993 for the Pacific Islands and Sharma 1996 for West Africa). The economic returns from fishing also vary greatly—a good trip can be followed by a series of bad trips and vice-versa. Hence, the occupation of fishing is risky—there are risks to both person and production. Even the development of modern technology (e.g., fish finders, improved fishing gear, safety technology and support) has not eliminated the risks. Such risks should lead to mental stress for participants, and stress should be an unpleasant state, so why do fishermen like their job?

Coping with Risk

Perceptions of risk vary the full polar range across individuals. With regard to risk to person, on one side of the range are those who enjoy extreme sports such as rock climbing and mountain snow boarding, while on the other are those who prefer to walk on maintained, level trails (see Priest 1994). Similarly, concerning risk to economic well-being the

same range of extremes are found with some content with a fixed salary occupation and the security of federally insured savings, and others prefer to become venture capitalists or play high-stake games of chance.

Some research has indicated that social and cultural values influence what is considered risky (Douglas and Wildavsky 1982; Covello and Johnson 1987). With regard to fishing, it has been noted that the value of bravery and fearlessness in the face of the dangers of the sea can be found in expressive culture relating to fishing peoples (see Pollnac et al. 1998; Binkley 1995)—for example, disasters at sea and the perils of the wild, stormy ocean are recounted in numerous sea chanteys, popular movies such as *Captains Courageous* and *The Perfect Storm*, and popular television documentaries on dangerous fisheries (e.g., the Discovery Channels' *Deadliest Catch*). Being part of a society that positively values the bravery of fishermen probably has some impact on fishermen's subjective perceptions of risk.

It has also been argued that certain psychological defense mechanisms and personality characteristics may minimize perceptions of and/or the stresses created by the sea's threats to person and production. Binkley (1995) suggests that a fatalistic attitude may function as a psychological protective mechanism for facing up to the dangers at sea. Pollnac, Poggie and their colleagues have found that denial of and/or habituation to the dangers can minimize perceptions of risk (Poggie et al 1995, 1996; Pollnac et al. 1995, 1998). Some have suggested that drugs, legal and illegal, can reduce stress associated with risk (cf. Kline et al. 1989).

Belief that ritual practices (e.g. taboos) and/or supernatural beings can shield one from the effects of the dangers can also function to reduce perceptions of relative risk or ameliorate resultant stresses. Long ago, Malinowski (1961) observed among Trobriand Island fishing people a relative lack of ritual associated with safe and secure inshore fishing in the inner lagoon as contrasted with the large amount of ritual associated with fishing in the blue water sea. Much later, quantitative research found a significant relationship between number of taboos and relative danger of fishing (Poggie et al. 1976; Poggie and Pollnac 1988). Interestingly, fishermen coming from fishing families in southern New England knew fewer taboos, suggesting to the authors that they were somehow pre-adapted to the dangers and needed less supernatural support (Poggie and Pollnac 1988). A similar finding and interpretation was reported for small scale fishermen from Orissa, India (Ray and Tietze 1985).

Finally, Pollnac et al. (1998) and Pollnac and Poggie (2006) attribute reduced perceptions of risk among fishermen to a personality type that can be characterized as being active, adventurous, aggressive, and courageous. Here, this cluster of personality traits is referred to as Personality Type 1,

which is manifested at different levels among fishermen. They cite numerous ethnographic examples wherein fishermen are noted as having these characteristics. They argue that the occupation of fishing selects for these personality characteristics; whereby fishermen not possessing these characteristics will be less likely to be satisfied with their occupation and will either drop out of fishing or be less successful, using other methods (e.g., the psychological defense mechanisms, personality characteristics and/or drugs as cited above) to cope with the stress. This is not to say that Personality Type 1 fishermen do not use these other coping techniques, they simply need to use them less frequently, and when they do, they are more effective. Hence, over time—everything else being equal—the proportion of fishermen possessing these characteristics will increase (Pollnac and Poggie 2006). They support their contention by demonstrating, once again in a quantitative analysis of job satisfaction, that fishermen like the thrill of the hunt, the challenge of facing the power and expanse of the sea, and the overall adventure of pitting oneself against the elements and finding fish as manifested by a dimension of job satisfaction that is not usually found in other occupations—a self-actualization component including “adventure” and “challenge” that has repeatedly emerged in such studies (see Pollnac et al. 2001; Binkley 1995; Gatewood and McCay 1990; Pollnac and Poggie 1988; Apostle et al. 1985).

The relationships between the variables in the model, as developed thus far, can be found in Figure 1. Figure 1 indicates that aspects of the marine environment (danger, elusive prey) result in risks to both production and person. Technology and knowledge, of course, have reduced some, but not all of these risks. (e.g., fish finders, fish aggregating devices, etc. reduce the elusiveness of the prey, and safety technology and procedures reduce the danger). It is the fishermen’s perception of the risks that influences stress. The various coping mechanisms influence these perceptions. Fishermen manifesting Personality Type 1 view the situation as less risky, but they also thrive on risk—some refer to this type in its extreme as adrenalin junkies. Other psychological coping mechanisms (e.g., Personality Type 2, habituation and denial) also serve to reduce the perceptions of relative risk. Ritual and religious belief influence perceptions of risk through actions on the part of the fisherman which influence supernatural powers to provide protection or help in guiding the fish to the gear or the gear to the fish. Drugs can reduce perceptions of risk and provide a false sense of efficacy, as well as directly reduce the stresses. It is important to note that Figure 1 is a heuristic model. The relationships depicted are not deterministic; they are probabilistic, derived from empirical research and propositions in the literature. The model is meant to provide a guideline for understanding the phenomena discussed and as a guide for further research, helping us to focus on the right questions. Because of its role in job satisfaction, the cluster of personality characteristics designated as Personality Type 1 in the model will be the focus in our quest to understand fishermen’s attachment to their occupation.

Happiness and Job Satisfaction

Involvement in behaviors one likes results in satisfaction and happiness. Recently it seems that measures of happiness are being taken more seriously, at least by some economists (e.g., Dixon 1997; Ng 1997; Oswald 1997). Further, there is an increasing emphasis among behavioral scientists on the transitory nature of the relationship between income and happiness (e.g., Kahneman et al. 2006; Layard 2005), and at least one national leader, the king of Bhutan has declared that gross national happiness (GNH) should be the measure of his country’s development (Esty 2004).

Since one’s occupation in most societies consumes much of an individual’s time, it appears that one’s level of happiness would be affected by satisfaction with aspects of their occupation. As noted by Pollnac and Poggie (2006) in their review of the literature, levels of job satisfaction have been associated with a number of socially significant variables such as mental health and longevity, family relationships, and job performance (Pollnac et al. 2001; Binkley 1995; Gatewood and

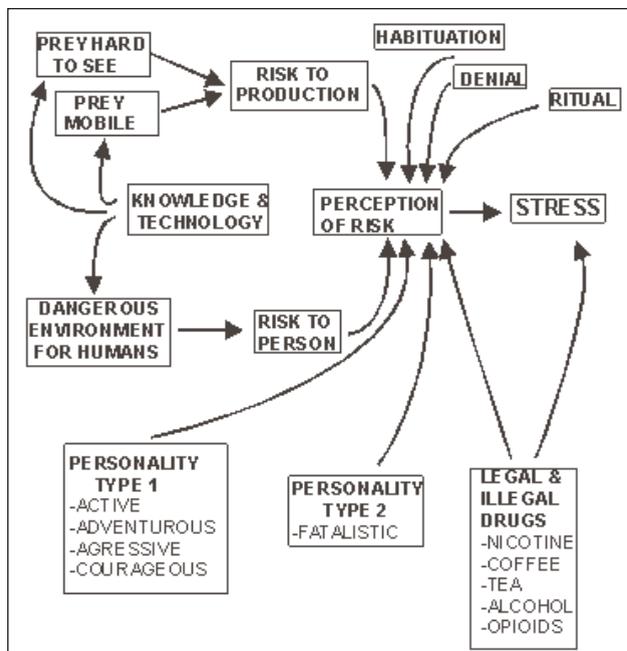


Figure 1. Heuristic model illustrating relationships between perception of risk and variables discussed in the text.

McCay 1990; Pollnac and Poggie 1988; Apostle et al. 1985)—all factors impacting and impacted by one's level of happiness. It is argued here that the relatively risky nature of the occupation of fishing attracts and holds individuals manifesting an active, adventurous, aggressive, and courageous personality; hence, these risky components of the job have a *positive* influence on their levels of happiness. The next important question involves the source of this personality type.

Genetics, Culture and Personality

What is the source of the active, adventurous, aggressive, and courageous personality type that adapts fishermen to the risks of their occupation? Is it derived from the enculturation or socialization process (Benedict 1928, 1932; Mead 1949, 1953) that is differentially influenced by varying ecological conditions and/or subsistence systems (e.g., Levine 1982; Edgerton 1971, 1978; Whiting and Whiting 1974; Goldschmidt 1965)? Or does it have its source in an individual's genetic make-up, a topic made less controversial by recent research (Pinker 2002). Or is it a combination of these two sources? Aspects of this personality type have been found to be related to a general latent psychological factor identified as an externalizing disposition that has a relatively large genetic component (LeGrand et al. 2005; Hicks et al. 2004). The externalizing disposition is composed of a complex of behavioral traits including an extroverted risk-taking personality and hyperactive behavior, as well as the potential for antisocial, oppositional behavior and substance abuse. Other research has found substantial genetic contributions to novelty and stimulation seeking—both aspects of an adventure seeking personality (Benjamin et al. 1996 and Larsson et al. 2006, respectively).

The possible existence of a genetic component related to an active, adventurous, aggressive, and courageous personality type should not be surprising. Fishermen manifesting this personality type are more successful as would be the hunters and gatherers who provided sustenance for human populations through most of the time humans have been on earth. This genetic component, which would have been advantageous for early humans, served us well, but when it was no longer needed, its frequency in human populations probably started a slow decline. It still exists, however, and those lucky (or unfortunate) to have it have to find other outlets for their need for novelty and adventure—risky sports and high stakes gambling, recreational hunting, marine sport fishing, and risky jobs like firefighting, policing, futures trading in the stock market, etc. Those who do not find other outlets or who may be misguided turn to self destructive behavior such as addictive gambling, crime (high risk) and substance abuse (LeGrand et al. 2005). Fortunately for fishermen, the occupation of fishing, a risky

occupation, can provide a certain level of adventure accompanied by various risks and hence, serve as a socially acceptable outlet for their need for action and adventure while increasing their levels of satisfaction and happiness.

Pollnac and Poggie (2006) argue that the source of this combination of personality characteristics (Personality Type 1) is a combination of individual, cultural and genetic factors, an approach that best fits arguments by modern studies in behavioral genetics (Baker 2004; Pinker 2002). However, they caution that these personality traits will not be manifested equally among all fishermen. Within a cultural matrix there will be variation in child socialization and other environmental factors, and variation in the cultural matrix can dampen the effects of the hypothesized genetic predisposition. Hence, they write that there will be variability in the traits within any fishing population. These variations are indicated by the statistically significant relationships between the self actualizing job satisfaction component and independent variables such as age, years fishing and crew position, marital status, fishing types, locales and sectors of the fishery reported by Pollnac and Poggie (1988, 2006) in their research. They note that other coping methods (as illustrated in Figure 1) can be used by those who manifest lower levels of the adaptive personality type; e.g., denial, habituation, a fatalistic personality, religious practices, ritual behavior, or the use of legal or illegal drugs, such as nicotine, alcohol, heroin, etc. (cf. Kline et al. 1989). Further, they indicate that those who cannot cope with the occupation of fishing may find another job or possibly become deviant (Edgerton 1978). Finally they write:

Hence, while the adaptive personality type will dominate in the sub-culture of fishing, other adaptive mechanisms will also facilitate participation or

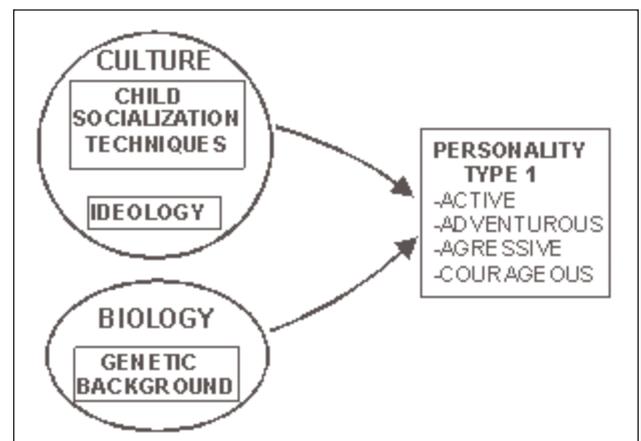


Figure 2. Heuristic model illustrating relationships between Personality Type 1 and variables discussed in the text.

Table 1. Relationships between personality type, occupation and job satisfaction

Personality Type 1		Occupation		Level of Job Satisfaction
Socialized	Genotype	Risky	Non-risky	
+	+	+	-	Very High
+	+	-	+	Very Low
-	+	+	-	High
-	+	-	+	Low
+	-	+	-	High
+	-	-	+	Low
-	-	+	-	Low
-	-	-	+	High

define alternative roles in the community. In this sense, the subculture of fishing represents a type of “organization of diversity” (Wallace 1961) . . . (Pollnac and Poggie 2006, 331).

Factors influencing personality type and the proposed relationships between Personality Type 1, risky/non-risky occupation types, and job satisfaction/happiness are depicted in Figure 2 and Table 1, respectively. Like Figure 1, Figure 2 is a heuristic model. It is meant as a guide for understanding the phenomena and for developing research. Table 1 is a preliminary model of how combinations of different genotypes, socialized personality types, and occupations dichotomized as risky/non-risky would influence the level of job satisfaction; hence, happiness of participants. It is recognized that in the real world the levels of manifestation of the personality type and risk of occupations will vary along a continuum. The table is meant to show that we can expect various combinations of the variables and different combinations will result in varying levels of job satisfaction or happiness.

Fishery Management, Happiness and Resilience to Change

These observations concerning job satisfaction and happiness have significance with regard to understanding the implications of changes in the fishery and the degree of fishermen’s resilience to these changes. The “self actualization” component, which appears in all quantitative analyses of job satisfaction among fishermen, supports the claim that fishing provides non-monetary benefits. Several researchers have suggested that non-monetary satisfactions, or satisfaction bonus, can push a fishery beyond maximum economic yield, increasing the chances for overexploitation (Smith 1981; Anderson 1980). Pollnac and Poggie (2006) cite examples of fishermen who are so attached to their occupation that they refuse to leave the fishery even though their incomes are declining. Further evidence is provided by McGoodwin (1990)

whose review of the literature, indicates that fishermen refuse to leave their occupation even as catches and incomes fall. He notes that this attachment to the occupation confounds fisheries managers and economists who do not understand the non-economic satisfactions derived from fishing.

In the introduction to this paper numerous examples of research confirming fishermen’s attachment to their work were provided. Hence, if we expect to reduce fishing pressure by convincing fishermen to shift to alternative occupations through provision of training programs, these jobs must provide some of the same non-monetary benefits as fishing. As Pollnac and Poggie’s analysis clearly demonstrates (see Figure 3, derived from data in Pollnac and Poggie 2006), factory-type jobs such as fish plant worker fail to provide the same level of satisfaction on the “self actualization” component as commercial fishing. Fishermen would probably resist entering such an occupation, and if they did, they would probably be so unhappy that they would suffer the negative impacts of job dissatisfaction.

A poignant example of the effects of the loss of activities fulfilling the needs of an active, adventurous, aggressive, and courageous personality type is provided by the Alaskan Eskimo. Hughes (1960, 133) as a result of research in Gambell, St. Lawrence Island in the 1950s, writes:

It is this role of the professional hunter—and its excitement, suspense, and freedom of activity, but also its dangers, insecurities, and frustrations—that changes with the changing occupational requirements of life in the modern world.

Concomitant with such changes, many Eskimo communities became plagued with alcoholism and associated antisocial behavior such as family violence (Hensel et al. 2003; Chance 1990)—the socially unacceptable manifestations of an expressive personality that appear when acceptable outlets are lost (LeGrand et al. 2005). The inescapable lure of alcohol and its negative impacts was so evident that most Alaskan Eskimo villages banned alcoholic drinks in their communities. Despite the banning of alcohol, other destructive manifestations of an expressive personality such as compulsive gam-

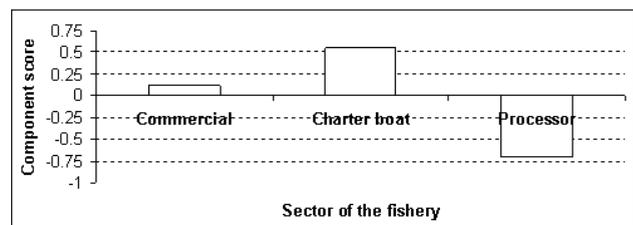


Figure 3. Satisfaction with self-actualization component in different fishing sectors in Southeast Alaska (based on data from Pollnac and Poggie 2006)

bling, antisocial behavior and the ultimate response to unsatisfied needs—high suicide rates (McNabb 1990)—continue. We are not claiming that there are not other factors influencing this behavior (cf. Chance 1990) or that the Eskimo are the only culture experiencing adverse responses to acculturation (see Maybury-Lewis 1997). An adequate explanation of behavior requires a multivariate approach, but we would contend that reductions in the risks associated with past subsistence patterns account for at least some of the variance. As discussed above, individuals manifesting Personality Type 1 thrive on these risks, and whether this personality type is culturally or genetically derived, or some combination of both, the effects would still be the same.

Hence, alternative occupation programs must take fishermen's love of adventure and risk into account to attract fishermen from their attachment to commercial fishing. Figure 3 suggests that charter boat operation, would be one attractive alternative to fishing in some areas. It results in an even higher level of satisfaction on the self-actualization component than commercial fishing in the Alaskan research. The acceptability of occupations in recreational fishing may not hold in some areas, especially where there is animosity between commercial and sport fishermen; nevertheless, it seems obvious that fishermen would prefer a substitute occupation dealing with catching fish in the ocean rather than a land based occupation. For example, one of the authors of this paper observed similar phenomena in Belize, where some fishermen displaced by marine protected areas became happily involved as marine tour and fly fishing guides in the rapidly developing marine based tourist industry. The problem there, as voiced by fishermen, is that the level of demand is lower than the supply of trained guides; hence resulting in displaced fishermen without acceptable alternative employment and high levels of dissatisfaction. The same probably applies to charter boat operations and other acceptable alternatives—does the potential supply of workers provided by displaced fishermen exceed potential demand?

In sum, successful fishermen have low fungibility. They are strongly attached to their occupation and it makes them happy. They resist leaving the fishery, and when they do enter a new occupation, they frequently find that it fails to satisfy their basic need for adventure. They become unhappy and try to return to fishing; hence, in the face of a changing world where management is trying to reduce the sizes of fishing fleets, the fishermen cannot easily adapt—they lack the resilience to cope with the dull, boring alternatives available in most communities. A commercial crabber from Alaska said, "As any fisherman's wife will tell you, fishing is an addiction. And for commercial fishermen, consider it a gambling addiction" (Arnold 2006). This is an insightful observation, fishing *is* like an addiction, and most fishermen would

do anything to avoid the potentially painful withdrawal symptoms.

Endnotes

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References

- Anderson, L. 1980. Necessary components of economic surplus in fisheries economics. *Canadian Journal of Fisheries and Aquatic Science* 37, 858-870.
- Apostle, R.L., L. Kasdan and A. Hanson. 1985. Work satisfaction and community attachment among fishermen in southwest Nova Scotia. *Canadian Journal of Fisheries and Aquatic Sciences* 42, 256-267.
- Arnold, C. 2006. A crabbers' life. *National Fisherman* 87, 6, 22-25.
- Baker, C. 2004. *Behavioral Genetics*. Washington, DC: American Association for the Advancement of Science.
- Benedict, R.F. 1928. Psychological types in the cultures of the Southwest. *Proceedings of the 23rd International Congress of Americanists*, 527-581.
- Benedict, R.F. 1932. Configurations of culture in North America. *American Anthropologist* 34, 1-27.
- Benjamin, J., L. Li, C. Patterson, B.D. Greenberg, D.L. Murphey, and D.H. Hamer. 1996. Population and familial association between the D4 dopamine receptor gene and measures of novelty seeking. *Nature Genetics* 12, 81-84.
- Binkley, M. 2002. *Set Adrift: Fishing Families*. Toronto: University of Toronto Press.
- Binkley, M. 2000. 'Getting by' in tough times: Coping with the fisheries crisis. *Women's Studies International Forum* 23, 3, 323-332.
- Binkley, M. 1995. *Risks, Dangers and Rewards in the Nova Scotia Offshore Fishery*. Montreal: McGill-Queen's University Press.
- Chambers, S. 2004. May we quota you: Buyback just a beginning. *National Fisherman* 84, 12, 25-26.
- Chance, N.A. 1990. *The Inupiat and Arctic Alaska: An Ethnography of Development*. Chicago: Holt, Rinehart and Winston.
- Covello, V.T. and B.B. Johnson. 1987. The social and cultural construction of risk: Issues, methods and case studies. In B.B. Johnson and V.T. Covello, (eds.), *The Social and Cultural Construction of Risk*. Boston: D. Reidel Publishing Co.
- Dixon, H.D. 1997. Economics and happiness. *The Economic Journal* 107 November, 1812-1814.
- Douglas, M. and A. Wildavsky. 1982. *Risk and Culture: An Essay on Selection of Technological and Environmental Dangers*. Berkeley: University of California Press.
- Edgerton, R.B. 1971. *The Individual in Cultural Adaptation: A Study of Four East African Societies*. Los Angeles: University of California Press.
- Edgerton, R.B. 1978. The study of deviance—marginal man or everyman? In G.D. Spindler (ed.), *The Making of Psychological Anthropology*, 444-476. Berkeley: University of California Press.

- Gateway, J.B. and B. McCay. 1990. Comparison of job satisfaction in six New Jersey fisheries. *Human Organization* 49, 1, 14-25.
- Goldschmidt, W. 1965. Theory and strategy in the study of cultural adaptability. *American Anthropologist* 67, 402-408.
- Hensel, C., S. Hakkenson, Jr., and G. Mohatt. 2003. "It's been good not drinking": Alaska native narratives of lifetime sobriety. *Arctic Anthropology* 40, 2, 75-82.
- Hicks, B.M., R.F. Krueger, W.G. Iacono, M. McGue and C.J. Patrick. 2004. Family transmission and heritability of externalizing disorders: A twin-family study. *Archives of General Psychiatry* 61, 922-928.
- Hughes, C.C. 1960. *An Eskimo Village in the Modern World*. Ithaca, NY: Cornell University Press.
- Kahneman, D, A.B. Krueger, D. Schkade, N. Schwarz and A.A. Stone. 2006. Would you be happier if you were richer? A focusing illusion. *Science* 312, 1908-1910.
- Kline, A., M.C. Robbins, and J.S. Thomas. 1989. Smoking as an occupational adaptation among shrimpfishermen. *Human Organization* 48, 4, 351-355.
- Larsson, H., H. Andershed and P. Lichtenstein. 2006. A genetic factor explains most of the variation in psychopathic personality. *Journal of Abnormal Psychology* 115, 2, 221-230.
- Layard, R. 2005. *Happiness: Lessons from a New Science*. London: Penguin Press.
- LeGrand, L., N. Iacono, G. William and M. McGue. 2005. Predicting addiction. *American Scientist* 93, 140-147.
- Levine, R.A. 1982. *Culture, Behavior, and Personality*. Chicago: Aldine.
- Malinowski, B. 1961. *Argonauts of the Western Pacific*. NY: E.P. Dutton & Co., Inc.
- Maybury-Lewis, D. 1997. *Indigenous Peoples, Ethnic Groups, and the State. Cultural Survival Studies in Ethnicity and Change*. Boston: Allyn and Bacon.
- McGoodwin, J.R. 1990. *Crisis in the World's Fisheries: People, Problems, and Politics*. Stanford: Stanford University Press.
- McNabb, S. 1990. Native health status and native health policy: Current dilemmas at the federal level. *Arctic Anthropology* 27, 1, 20-35.
- Mead, M. 1949. *Coming of Age in Samoa*. New York: Mentor.
- Mead, M. 1953. *Growing up in New Guinea*. New York: Mentor.
- Ng, Y. 1997. A case for happiness, cardinalism, and interpersonal comparability. *The Economic Journal* 107, 1848-1858.
- Oswald, A.J. 1997. Happiness and economic performance. *The Economic Journal* 107, 1815-1831.
- Pinker, S. 2002. *The Blank Slate: The Modern Denial of Human Nature*. NY: Viking-Penguin.
- Poggie, J.J., R.B. Pollnac and C. VanDusen. 1996. Intracultural variability in the cognition of danger among southern New England fishers. *Marine Resource Economics* 11, 23-30.
- Poggie, J.J., R.B. Pollnac and S. Jones. 1995. Perceptions of vessel safety regulations: A southern New England fishery. *Marine Policy* 19, 5, 411-418.
- Poggie, J.J., R.B. Pollnac and C. Gersuny. 1976. A multivariate analysis of ritual behavior among fishermen in southern New England. *The Journal for the Scientific Study of Religion* 15, 257-262.
- Poggie, J.J. and R.B. Pollnac. 1988. Danger and rituals of avoidance among New England fishermen. *Maritime Anthropological Studies* 1, 6678.
- Pollnac, R.B. and J.J. Poggie. 1988. The structure of job satisfaction among New England fishermen and its application to fisheries management policy. *American Anthropologist* 90, 888-901.
- Pollnac, R.B. and J.J. Poggie. 2006. Job satisfaction in the fishery in two Southeast Alaskan towns. *Human Organization* 65, 3, 329-339.
- Pollnac, R.B., J.J. Poggie and C. VanDusen. 1995. Cultural adaptation to danger and the safety of commercial oceanic fishermen. *Human Organization* 54, 2, 153-159.
- Pollnac, R.B., J.J. Poggie and S.L. Cabral. 1998. Thresholds of danger: Perceived risk in a New England fishery. *Human Organization* 57, 1, 53-59.
- Pollnac, R.B., R.S. Pomeroy and I.H.T. Harkes. 2001. Fishery policy and job satisfaction in three southeast Asian fisheries. *Ocean and Coastal Management* 44, 531-544.
- Pomeroy R.S. 1992. Aquaculture development: An alternative for small scale-fisherfolk in developing countries. In R.B. Pollnac and P. Weeks (eds.), *Coastal Aquaculture in Developing Countries: Problems and Perspectives*, 73-86. International Center for Marine Resource Development, University of Rhode Island.
- Priest, S. 1994. The how and why of risk taking behaviors. Paper presented in the symposium, Pushing the Envelope: Models, Theories and Outcomes of Risk in Society at the 5th International Symposium on Society and Resource Management. June 7-10, Fort Collins, Colorado.
- Ray, R. and U. Tietze. 1985. The influence of traditional caste on present economic and occupation status, perception of nature and trade, child socialization and religious practices and rituals. In U. Tietze (ed.), *Artisanal Marine Fisherfolk of Orissa*, 150-167. Cuttak, India: Goswami Press.
- Sharma. 1996. Choppy seas, unsafe work. *Samudra* 14, 29-30.
- Sievanen, L., B. Crawford, R.B. Pollnac, and C. Lowe. 2005. Weeding through assumptions of livelihood approaches in ICM: Seaweed farming in the Philippines and Indonesia. *Ocean and Coastal Management* 48, 297-313.
- Smith, C.L. 1981. Satisfaction bonus from salmon fishing: Implications for management. *Land Economics* 57, 181-196.
- Smith, I.R. and R.P. Smith. 1980. A fishing community's response to seaweed farming. *ICLARM Newsletter*, 6-8.
- Tango-Lowy, T. and R.A. Robertson. 2002. Predisposition toward adoption of open ocean aquaculture by Northern New England's inshore, commercial fishermen. *Human Organization* 61, 3, 240-251.
- Thompson, P., T. Wailey and T. Lummis. 1983. *Living the Fishing*. London: Routledge and Kegan Paul.
- United Press International (UPI). 2001. New England's buyback program called a success, but challenges persist. UPI. Feb. 14, 2001.
- Van Zile, D. 2001. Council challenge: What to buy back for \$10 million. *National Fisherman* 82, 5, 11.
- Walton, H. 1993. Public education for safety at sea. *South Pacific Fisheries Commission Fisheries Newsletter* 66, 33-35.
- Wallace, A.F.C. 1961. *Culture and Personality*. NY: Random House, Inc.
- Whiting, B. and J.W.M. Whiting. 1974. *Children of Six Cultures*. Cambridge, MA: Harvard University Press.
- World Bank. 2000. *Voices from the Village: A Comparative Study of Coastal Resource Management in the Pacific Islands*. Pacific Islands Discussion Paper Series No. 9. Washington D.C.: The World Bank.