

Measuring Subjective and Objective Well-being: Analyses from Five Marine Commercial Fisheries

Courtland L. Smith and Patricia M. Clay

Well-being is an important indicator of how participants in an industry are doing. Since the 1970s, anthropologists have been developing and utilizing “well-being” as an indicator, along with identifying the advantages and disadvantages of such a metric. Building on this experience, a “well-being” index is useful if it (1) is easily developed from available data; (2) enables temporal and spatial comparisons; (3) can be applied at multiple scales; and (4) possesses subjective and objective elements. The subjective element reflects how individuals and members of occupational communities perceive their situation. Using five case studies of North American marine commercial fisheries, an approach to representing subjective and objective measures of well-being is illustrated and evaluated. These studies show that commercial fishing has historically been a highly valued occupation from both subjective and objective perspectives. However, the status of commercial fishing has been in a state of decline over the past several decades with corresponding impacts on well-being. Suggestions for expanding the measurement of well-being and making it applicable to a broader set of activities and to time-series analysis are included.

Key words: well-being, subjective-objective measures, commercial fishing, North American

Perspectives on Well-being

Well-being is a concept common to anthropology, economics, psychology, sociology, and other social sciences. It is frequently tied to financial status, yet well-being is broader than economic or material well-being alone. It includes subjective elements that indicate how a condition is perceived by participants, as distinct from an objective and independently observable assessment of conditions. To construct a well-being indicator, we need to know first what is important to individuals and communities. Many studies identify candidate variables such as income or education level (Clay and Abbott-Jamieson 2006; NOAA

1987). These can be objectively measured over time, but people also have impressions or perceptions that life is good or bad, improving or worsening. How people, households, occupational groups, and communities perceive their well-being is important in determining how satisfied or happy they are (Campbell, Converse, and Rodgers 1976; Eid and Larson 2008; Gullone and Cummins 2002).

Objective or external measures often do not track with self-reported or subjective measures. People may be highly satisfied with a life way that seems poor by objective measures. Sometimes people with below-average incomes rank their well-being as high. This is the perceptual or subjective side of well-being: “well-being is experiential, what people value being and doing” (Millennium Ecosystem Assessment 2005a:73). Comparing what people think with objective measures about their situation provides valuable insights on the relation between happiness and income (Easterlin 2001). Multiple anthropological studies of fisheries have measured subjective well-being, and often these studies include objective measures. For example, anthropologists have argued that job satisfaction is often more important than income to fishermen¹ (Acheson et al. 1980; Gatewood and McCay 1990). Sometimes, fishermen actually subsidize their desire to fish with other income and tend to emphasize the benefits of fishing over the costs (Anderson 1980; McCay et al. 1993; Smith 1981).

Developing subjective and objective well-being measures raises the question of how to create a set of well-being variables that allow comparisons between and within occupational

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activities. Problems with well-being variables are: they are typically static, covering only one point in time; data are not always readily available; predefined indices may miss situation-specific issues; and the data are expensive to collect. Well-being data are a legal requirement under the United States National Environmental Policy Act of 1976 (NEPA) whenever Federal actions are undertaken that will significantly affect the quality of the human environment (NEPA Sec. 102 [42 USC § 4332], and under the Magnuson-Stevens Fishery Conservation and Management Act (MSA)² [16 USC § 1802 Sec. 301(8), Sec. 303(a)(9), and Sec. 303(b)(6)], and of laws in many other Nations (Vanclay 2006).

In developing a well-being measure, four criteria are considered. First, can the measure be easily constructed from available data? Second, does the measure enable spatial and temporal comparisons? Third, is the measure applicable at multiple scales, thereby addressing idiosyncratic, group, and regional dimensions of well-being? Finally, does the measure possess both objective (independently observable) and subjective (participant views) elements?

Measuring Subjective and Objective Well-being

Many efforts over the last 80 years have tried to identify well-being variables and indices (Bossard 1927; Distaso 2007; Duncan 1974). Most results, however, have not been put to use. Social and economic indicator variables became popular in policymaking in the 1960s (Gruenwald et al. 1997). Initial difficulty in coming up with useful indicators for well-being led to the use of strictly economic indicators. Research by Gruenwald et al. (1997:9) cites a “peculiar tendency to devolve into theoretically soft issues of ‘quality of life.’” However, the literature on this topic, even by the 1990s, shows considerable thought on just what “quality of life” means and how to measure it. Efforts after 1990, such as the Millennium Ecosystem Assessment (2005a, 2005b), discuss social and cultural capital or assets (Costanza and Daly 1992; Costanza et al. 2001; Field 2003; Jansson et al. 1994; World Bank 2006). The Human Development Index (UNDP 2009), Index of Sustainable Economic Welfare (Daly and Cobb 1989), the Fordham Index (Miringoff, Miringoff, and Opdycke 2001), and Gross National Happiness (Brooks 2008) also aim to measure social well-being. In fisheries, the Jepson and Jacob (2007) vulnerability index and the Genuine Progress Index (Charles 1989; Pannozzo et al. 2008) more broadly create combined bio-socioeconomic indices. But practice suggests that indicator variables or sets of indices have not emerged that meet the wide range of requirements for a useful well-being index.

A list of potential variables useful in most fishery contexts was developed by the NOAA Fisheries Social Impact Assessment (SIA) Modeling Workshop (Pollnac et al. 2006). The SIA systems models developed in this workshop hypothesize an overall well-being measure composed of subjective and objective components.

Theory in anthropology and other disciplines identifies gaps between subjective and objective indicators (Bernard 2002; Dehaene, Sergent, and Changeux 2003). Perception, as the subjective indicator, is the self report by an individual about their situation. Objective indicators yield similar results with repeat observations and observers. Gasper (2007) notes that subjective well-being measures perceptions, while objective measures of well-being come from observed and actual conditions and do not depend on the respondent’s perceptions.

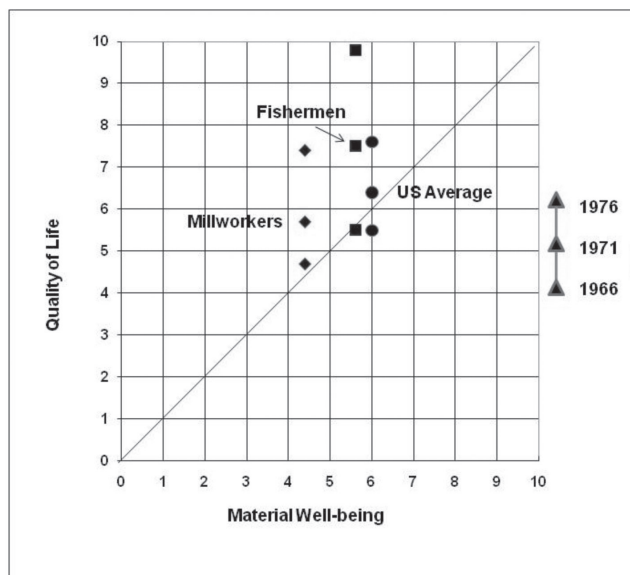
A growing interest is developing in subjective measures of happiness or satisfaction (Campbell, Converse, and Rodgers 1976; Eid and Larsen 2008; Ryan and Deci 2001; Sirgy 2002; van Praag and Ferrer-I-Carbonell 2004; Zumbo 2002). In the anthropological literature, the subjective perception of satisfaction is more commonly measured than happiness. A number of commercial fishery studies have dealt with both general satisfaction and job satisfaction (Apostle, Kasdan, and Hanson 1985; Binkley 1995; Gatewood and McCay 1988, 1990; Pollnac and Poggie 1988, 2006; Pollnac and Ruiz-Stout 1977; Pollnac et al. 2006; Pollnac, Pomeroy, and Harkes 2001; Smith 1980, 1981). Objective measures associated with the subjective vary and sometimes are omitted.

Measuring subjective well-being relies on how a respondent (to a set of open-ended survey questions, an interview, or a ranking instrument) places him or herself on a scale. Thus, the goal is to compare a subjective measure of happiness or satisfaction with an objective measure of material well-being. An approach by Inglehart and Klingemann (2000; Inglehart 1997) uses subjective data from happiness and satisfaction questions asked in over 65 countries and objective data from the World Bank (1997). The relations between the subjective measure of happiness/satisfaction on the vertical axis and the objective measure of GNP per capita on the horizontal axis show a bowing of points above a 45° line drawn from the lowest level of happiness/satisfaction and GNP per capita to the highest (World Values Survey 2009). The points rise steeply from the origin at the lower left, which would represent situations of low happiness/satisfaction and low GNP per capita. The curve then bends toward the upper right quadrant that represents high satisfaction and high GNP per capita. Nearly all the points are above a 45° line drawn from the origin to the top right of the graph. None of the countries measured by Inglehart and Klingemann (2000) have the low satisfaction and high GNP per capita represented by the lower right quadrant. Anthropological fisheries research suggests that fishermen most often fall in the upper left quadrant of high satisfaction and low or moderate material well-being. As we will see, the actual data suggest a more complex picture.

Five Case Studies of Marine Commercial Fisheries

Building on Inglehart and Klingemann’s (2000) approach, our focus shifts to displaying the relationship between subjective and objective well-being in commercial fisheries. We use five cases from the anthropological study of marine

Figure 1. Quality of life (subjective well-being) as measured by Cantril's ladder of life at the time of the survey (1971) and asking people's impressions for five years before and after. The subjective measure is plotted against the objective well-being measured by identifying the number of material objects found in each respondent household. Fishermen (squares) see their quality of life and their material well-being as greater than that of mill workers (diamonds). The average quality of life for United States citizens (Watts and Free 1974) is shown by circles.



commercial fisheries—Galilee, Rhode Island (Poggie and Gersuny 1974), New Jersey (Gatewood and McCay 1988, 1990), Nova Scotia (Apostle, Kasdan, and Hanson 1985; Binkley 1995), Southeast Alaska (Pollnac and Poggie 2006), and the Oregon coho salmon fishery (Smith and Gilden 2000). These studies are analyzed based on measures plotted in a manner similar to the World Values Survey (2009) data to represent the fisheries both numerically and visually.

Fishermen and Millworkers in Rhode Island

Poggie and Gersuny (1974) conducted the first anthropological job satisfaction study of commercial fishermen. The 29 fishermen interviewed represented about 10 percent of the total fishing enterprises in the port of Galilee, Narragansett, Rhode Island. Nearly all the comparator group was from a local textile mill ($n=29$). Using the method of controlled comparisons, “fishermen and a comparable landbound occupational group” were compared (Poggie and Gersuny

1974:51). For the objective measure of material well-being, Poggie and Gersuny listed 15 material household items and asked respondents to check the ones they had. They measured subjective well-being using Cantril's (1963) self-anchoring scale of optimism, a 10-step ladder from the worst to the best quality of life. Respondents were asked to mark their situation on the ladder for five years ago, now, and what they expected five years in the future. Six mill workers and 24 fishermen completed the survey on this item.

Figure 1 shows the results for the two populations. Note that fishermen (squares) expressed higher quality of life for past, present, and future than mill workers (diamonds). Fishermen also expressed higher quality of life than the United States population as a whole based on Watts and Free (1974) data. Watts and Free (1974) do not report comparable national data for material well-being. The median family income for the town of Narragansett was 90 percent of that for the nation as a whole. Thus, the data points for the United States are moved to the right one material well-being unit and located at 6. This reflects the 10 percent higher United States median family income and assumes that Watts and Free have a representative sample of United States families.

This was a period in United States fisheries when the FCMA² was under discussion and many assumed the Act would remove foreign vessels from United States waters and open up new fisheries to United States fishermen. Figure 1 shows that fishermen felt they were better off in 1971 than 1966 and were particularly optimistic about the future (1976). All three groups fall above the 45° line, and fishermen are in the upper right quadrant indicating high subjective and objective well-being relative to mill workers.

Six New Jersey Fisheries

To show differences among six fishing activities, Gatewood and McCay (1988, 1990) surveyed 391 New Jersey bay, oyster, clam, scallop, dragger (trawler), and longline captains, mates, and crew. Analyzing 33 items about job satisfaction, they found three job satisfaction categories that they grouped using their judgment according to Maslow's (1943) hierarchy of needs: survival/security, belongingness/esteem, and self-actualization. Maslow ranks the needs hierarchy with most basic needs at the foundation—physiological and safety, which Gatewood and McCay (1990) combined into survival/security. Maslow's next two levels, love/belonging and esteem, are combined as belongingness/esteem. Maslow's survival, security, belongingness, and esteem are referred to as “deficiency needs” or “D-needs,” which cause anxiety when not met. These are required, non-feeling needs. Self-actualization is the desire to reach one's full potential. For the subjective measure of job satisfaction, we use self-actualization, about which Gatewood and McCay (1990:21) say, “[It] is especially interesting that the highest levels of satisfaction occur with respect to the most intangible of rewards, i.e., the category of self-actualization needs.” Ideally, self-actualization (as a desire that one has) is compared against a material measure of income or wealth.

Figure 2. Self-actualization as the subjective measure of well-being plotted against the earnings ratio as the objective measure of well-being for six New Jersey fisheries (Gatewood and McCay 1988, 1990). All the fisheries fall in the upper left quadrant of lower than average earnings (objective measure) and high self-actualization (subjective measure).

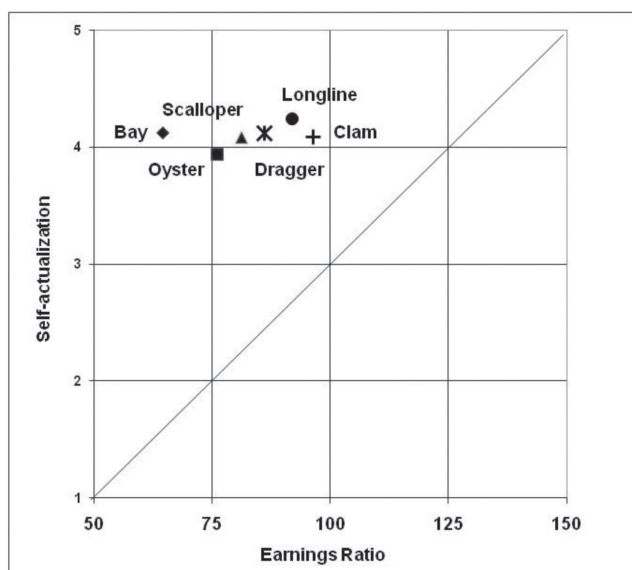
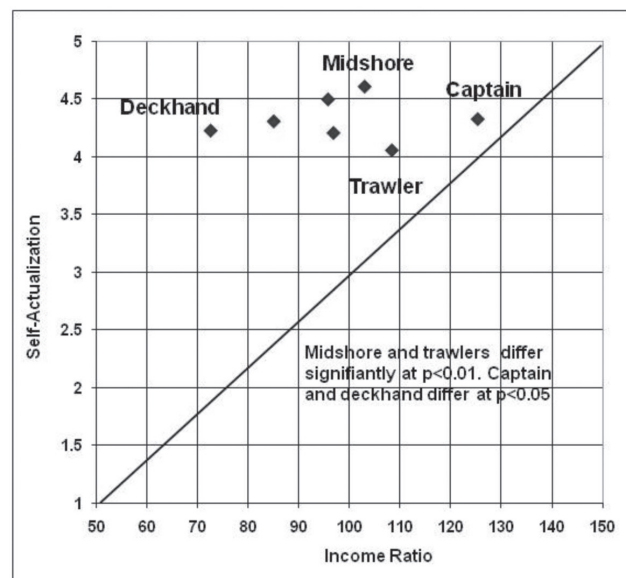


Figure 2 shows self-actualization scores for the six New Jersey fishery gear groups versus the ratio of the average income of each fishery group to the state median household income in the 1990 census, adjusted to 1985. Gatewood and McCay (1988) developed two survey questions to obtain self-report of earnings. Their data show very little difference in average self-actualization scores for the composite-index of each fishery. More variation is shown in income, which is ordered from the lowest for baymen to highest for clammers. In all six fisheries, incomes were below the state median household income. Note that the fishing groups fall in the upper left quadrant where the subjective measure (self-actualization) is high and the objective measure (average income) is low to moderate.

Nova Scotia Offshore Fishery

In 1986, Binkley (1995) led a project to interview 334 captains and crew who fished in the trawl, scallop, and mid-shore fisheries. The research was done in the context of limited entry and quota management, but the focus was on the risk associated with fishing, particularly with the introduction of new technologies. The research reported the income of

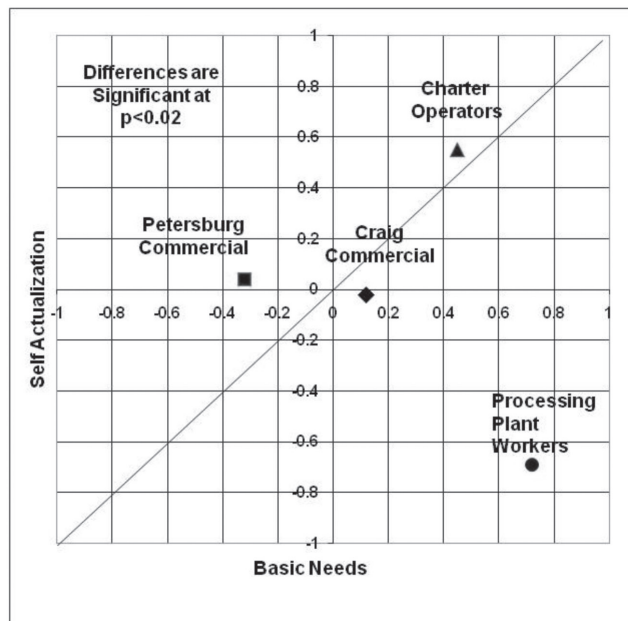
Figure 3. Nova Scotia deckhands and captains, and midshore and trawler fishery, comparisons of self-actualization (Binkley 1995) versus average income compared to province average. Self-actualization is calculated on the same five-point scale as in the New Jersey example. Income is reported by province (Binkley 1995). The income for each group is divided by the province average to obtain a ratio. In 1986, the Nova Scotia median household income was \$34,457 (Statistics Canada 1989). The unlabeled points are (from left to right) scallopers and small and large enterprises.



each fishing group and included three Maslow-type measures: survival/security, belonging/esteem, and self-actualization. The self-actualization measure is a subjective measure of job satisfaction.

Figure 3 shows a plot of each group's income with their self-actualization measure. Income is a ratio of the provincial average. The measures fall across the upper quadrants above the 45° line. As expected, deckhands have a lower income level than captains. Neither captains nor deckhands differ much on self-actualization, suggesting high levels of job satisfaction for both. Trawlers and mid-shore fishermen do not show much income difference, but the mid-shore fishermen have higher job satisfaction. Their higher job satisfaction stems from shorter times at sea and fishing closer to home (Binkley 1995). Small boats, which stay close to shore, score just below mid-shore fishermen in terms of self-actualization. Large boats, which fish further out, come right above trawlers. Small and large boats are more similar to each other on

Figure 4. Two communities and three occupations using factor scores for self-actualization as the measure of subjective well-being and basic needs as the indicator of material well-being (Pollnac and Poggie 2006).



income than trawlers and mid-shore fishermen, but vary more on self-actualization. Nova Scotia fishermen were spread out in terms of income. Mid-shore, trawl, and captains were in the upper right high income and satisfaction quadrant, while the others were in the upper left, less income but still high satisfaction.

Petersburg and Craig, Alaska

This study compared the job satisfaction of three occupations—commercial fishermen ($n=82$), charter boat operators ($n=14$), and processing plant workers ($n=39$) in two Alaskan communities (Pollnac and Poggie 2006). Here, instead of providing raw scores averaging the responses to questions, the data are factor scores of self-actualization and basic needs. The basic needs factor is the objective, material well-being measure. Factor scores are normalized to the population being studied, and, thus, cannot be compared across studies as can indices or absolute measures like income.

Figure 4 shows the low self-actualization ranking of processing plant workers, who fall in the lower right quadrant. This position is relatively rare in analyses of satisfaction and suggests that while material needs are being met, job satisfaction is not. This may reflect the low level of control

over daily work activities experienced by processing plant workers. Craig and Petersburg, Alaska commercial fishermen, have similar self-actualization scores, but the material needs score is lower in Craig than in Petersburg. Craig is described as "...on the down side of a boom cycle" (Pollnac and Poggie 2006:332) and has a less diverse economy than Petersburg and little fish processing. The other interesting difference appears between commercial fishermen and charter boat operators. Charter boat operators rank higher than commercial fishermen and processing plant workers in self-actualization. The charter boat operators are the only group in the upper right quadrant above the 45° line. Petersburg, where nearly three-fourths of the commercial fishermen are located, has a more diverse economy in which "...commercial fishing dominates the local economy with tourism ...providing some diversification" (Pollnac and Poggie 2006:331). Still, commercial fishing is subject to pricing and regulatory pressure due to competing supplies of farmed fish and management constraints to protect stocks in both communities. Thus, while the commercial fisheries are under stress, even in the more diversified Petersburg economy, recreational fishing is less subject to global market competition and has more options to serve their clients. The occupational differences between the three groups are significant ($p < 0.001$) (Pollnac and Poggie 2006:334). These patterns reflect the relative positions among these occupational groups. Processing plant workers have the highest basic needs scores. With respect to self-actualization, commercial fishing ranks in the middle between charter boat operators and processing plant workers.

Oregon Coho Salmon Fishery

The Pacific Fishery Management Council implemented a continental United States West Coast closure of commercial and recreational fishing for coho salmon (*Oncorhynchus kisutch*) in April 1994. Various factors had contributed to the decline in salmon populations including: over-reliance on hatcheries; poor ocean productivity; inaccurate scientific assessments of stock abundance; excessive fishing pressure; detrimental forest, farm, and urban land use practices; and changing scientific and public attitudes giving greater value to wild and naturally-spawning coho (NRC 1996). In addition, catches in Alaska and competition from farmed fish led to declining prices for Northwest troll and gillnet-caught salmon (Smith et al. 2000).

All coastal fishing communities in Northern California, Oregon, and Washington were affected by the fishery closure. Those fishing for coho include recreationalists who fish from private boats and ocean charters, Native Americans trolling in the ocean and netting in the rivers, commercial trollers and gillnetters, and anglers fishing from jetties and in rivers (Smith et al. 2000). In 1994, a federal disaster relief program was implemented for the Pacific Northwest coho salmon fishery. A study of disaster relief program results was conducted by Oregon Sea Grant's Adapting to Change Program. One focus was determining how gillnetters and

trollers weathered the closure (Gilden and Smith 1996a, 1996b; Smith and Gilden 2000).

In October 1995, a survey was sent to all 666 Columbia River, Willapa Bay, and Gray's Harbor gillnetters; the response rate was 53 percent ($n=355$). In March 1996, a 25 percent representative sample of 390 trollers, eligible for Oregon troll permits in 1994 ($n=1,821$), was surveyed. The response rate was 57 percent ($n=225$). A five-part question asked respondents to compare their current economic, family, health, stress, and overall situations with five years previously, but did not ask about the future.

Figure 5 shows some comparative satisfaction data by income level for University of Oregon students (OSRL 1999), Oregon watershed coordinators (Johnson 2007), and lawyers (Oregon State Bar 2002) compared with gillnetters and trollers. The objective material well-being measure is the ratio of income to the 1999 state median household income adjusted to the date of each survey. The students' incomes were obtained from census data. Watershed coordinators work as contractors, and the median contract value is known. The Oregon Bar lawyer's survey reported median income.

The greater dissatisfaction, especially among gillnetters, stems from their self-reported perception of being blamed for the salmon decline. In their narrative comments on the surveys, gillnetters and trollers had pointed out to managers and the public the real causes of salmon decline—dams and obstructions to fish passage, habitat loss, poor management, and inaccurate science. They perceived they had been unjustifiably blamed for a problem they did not cause.

The pattern for fishermen in Figure 5 is unlike any in the other case studies. In those, the subjective satisfaction measure for commercial fishermen was at or near the upper half of the graph and close to or above the 45° line. Here, the satisfaction scores for gillnetters fell in the lower half and below the 45° line. This is despite the fact that gillnet and troll incomes, which are quite similar, are at the median for the state and above the median for the coastal communities in which most gillnetters and trollers live.

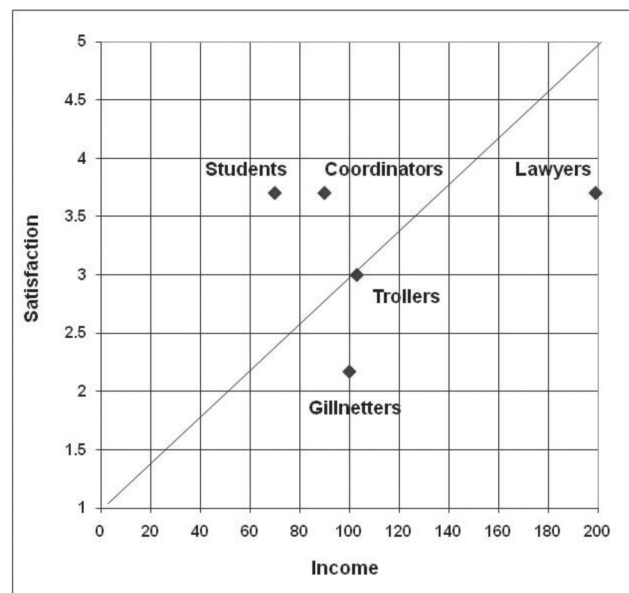
Discussion

Two important elements for this analysis are the measurement of income and job satisfaction. Income, as the objective measure, is well understood from census studies and as a variable in surveys. While the categories of income are complex, they are usually well defined and understood. For job satisfaction, the categories are less well defined and agreed upon. Yet, the surveys and factor analyses of anthropologists with respect to commercial fisheries have begun to yield some commonalities on how to approach the subjective measure.

Measuring Income

A number of issues arise from these case studies that make the development of useful comparative measures difficult. Income is not a simple variable to use for comparison.

Figure 5. Trollers' and gillnetters' satisfaction and income compared with those of students, watershed coordinators, and lawyers.



First, what is income? Is it gross or net earnings from a business, taxable income, or income from fishing only? Should per capita, household, or family income be used?

Second, should average or median income be used? Income distributions have a positive skew. This means that the average income is higher than the middle or median income because a few people make very large incomes relative to the most common or modal income. Income for groups of commercial fishermen is most often reported as an average.

Third, what is the unit to be used for income comparisons? Fishermen operate from coastal communities, but gear groups extend across state lines. Should comparator material measures be for the coastal community, the predominant state, or the region?

Fourth, should income estimates be absolute values, ratios of the median or average income, or will other material measures do? The income comparisons used were a count of material items, ratios with median or average incomes for the community, state, or region, and Maslow's survival/security need score. For occupations like fishing, complete income distributions are seldom reported, which leads to comparing average incomes.

Different scales for reporting data can affect visualization of results. Figure 5 looks different from Figures 2 and 4 because lawyers' median income was 200 percent of the median Oregon household income. Thus, the income scale goes from 0 to 200 rather than 50 to 150 percent as in Figures 2 and 4. Thus, widely used variables like income require that a number of aspects be reviewed before their use.

Factoring Job Satisfaction

Many surveys have used sets of questions that are later factored or made into indices of job satisfaction (Apostle, Kasdan, and Hanson 1985; Binkley 1995; Gatewood and McCay 1988, 1990; Poggie and Pollnac 1978; Pollnac and Poggie 1988, 2006; Smith 1981). The elements of job satisfaction identified through factor analysis show commonalities, but no one set of questions has been agreed upon.

Poggie and Pollnac (1978) used factor analysis to identify groupings of the statements that encompass the dimensions of job satisfaction as an indicator of well-being. For Galilee fishermen, they identified four factors—time, outdoors, earnings, and independence. Apostle, Kasdan, and Hanson (1985) list eight factors—*independence, work quality, earnings, time/trip length, adventure, offshore, time/family, and crowding*. Binkley (1995:76), comparing these previous studies and including her work in Nova Scotia, concluded that findings from these studies “...yielded similar results, with minor discrepancies....” The selection of factors varies between studies depending on whether eigenvalues or a scree test is used. The number of factors identified affects analysis and yields differing results.

Gatewood and McCay (1988, 1990) classified job satisfaction statements used by Poggie and Pollnac (1978) and Apostle, Kasdan, and Hanson (1985) according to Maslow’s needs hierarchy in which survival/security is more material and self-actualization is more perception oriented, but constructed additive indices rather than doing factor analysis. Pollnac and Poggie (2006), using statements quite similar to those used in previous studies, come up with three factors for Southeast Alaska—*place and control, basic needs, and self actualize*. Factor names are assigned according to the content of statements that make up each factor. For example, some of the statements in Pollnac and Poggie’s (2006) basic needs factor are “job safety,” “predictability of earnings,” and “your earnings.” As can be seen from the common factor wordings, factors labeled “earnings” and “basic needs” appear to be about physiology and safety at the base of Maslow’s hierarchy of needs. Statements in the self-actualization factor include “independence” and “adventure.”

Factor models and the Maslow hierarchy of needs can be used for these comparisons. Without raw scores, however, comparisons between settings are difficult. The factor scores commonly reported are applicable only to the set of data being analyzed. Even factor analyses done for the same population at different times will not provide adequate comparisons because factor models take an existing data set and find the patterns only within it. Gatewood and McCay (1988, 1990) resolved this problem by using indices. Gatewood (personal communication, 2009) makes the point, “[I]ndices preserve the original response scale, which makes direct comparisons possible with similar surveys done elsewhere or other times.”

Subjective Measurement of Satisfaction

At least three approaches are available for measuring satisfaction. First is the list of items developed in these studies of marine commercial fisheries. The second is to use one of the measures available in other disciplines. Third is to use the best that is available.

The lists of items in the five studies suggest that four items are common to the self-actualization scale. Pollnac and Poggie (2006:332) list the statements as the “challenge of the job,” “adventure,” “doing something worthwhile,” and “working outdoors.” Common usage and wording of these statements in combination with others specific to the situation being analyzed would give the flexibility to add questions for specific locations, while also having a common set for comparison.

To relate fisheries to job satisfaction more broadly, psychology and sociology have both developed questions to measure satisfaction (Dawis 2003; Field 2003). The happiness and satisfaction questions in the World Values Survey (Inglehart, Basañez, and Moreno 1998) are subjective measures of well-being. These questions have 4 and 10-point scales, respectively, and could be used. These questions may not be very satisfying to anthropologists looking for deeper insights about job satisfaction. Including a general happiness or satisfaction question in a set of fisheries questions would enable comparison with other occupations and nations. A second alternative would be to use the four questions developed by Lyubomirsky and Lepper (1999). They develop an index from a person’s perception of their own happiness, how they think they are viewed by peers, and how they think they compare with others’ happiness and unhappiness.

The best choice for a comparator would be the Gallup-Healthways Well-being Index that is being tracked daily in the United States (Gallup-Healthways 2008). The six item index includes Life Evaluation, Emotional Health, Physical Health, Healthy Behavior, Work Environment, and Basic Access. Because of the daily data gathering, the ability to track trends, and the comprehensiveness, the Gallup-Healthways Well-being Index is very reliable and usable.

Self-actualization, satisfaction, happiness, and perceived well-being are highly correlated. Thus, if any one of these measures is available, it is useful. The comparison between watershed coordinators, lawyers, and gillnetters and trollers was made this way. No one synthesis can dictate what will get done. As a general rule, it is always desirable to (1) include the qualitative with the quantitative, (2) compare with other populations, (3) relate to past studies, and (4) watch temporal trends. Being too fixated on a numerical value may mean missing a qualitative detail that provides new insight or explanation. But, convincingly representing differences and trends requires a simply and effectively communicated quantitative result.

Accomplishing standardization for measuring well-being should be at a minimum a joint effort between NOAA Fisheries, EPA, and the United States Forest Service. If NEPA

review required a common approach to measuring well-being, data would begin to be gathered, and, over time, a rich source for comparison would be developed. To the extent that agencies of other Nations require SIA and adopt this standard, even broader comparison would be possible.

Conclusions

The overall results suggest that commercial fishermen usually have higher than average perceptual well-being as measured by ladder of life, self-actualization, and job satisfaction measures. The “satisfaction bonus” from fishing has been noted in both anthropology and economics (Anderson 1980; Binkley 2002; Griffith and Valdés Pizzini 2002; Pollnac and Poggie 2006; Santopietro and Shabman 1992; Smith 1981). While the five case studies suggest a general pattern of strong liking of fishing as an occupation and often good income from fishing, they also reveal system-specific factors. The fishermen of Galilee were perceptually and materially better off than their millworker counterparts. The six groups of New Jersey fishermen all had similar levels of self-actualization despite wider income differences. In Nova Scotia, captains were better off financially than crew, but both had similar self-actualization scores. Mid-water fishermen made about the same amount as trawlers but were more satisfied with fishing as an occupation. Alaskan charter boat operators had better perceptions of satisfaction and better income than commercial fishermen. Oregon gillnetters and trollers experiencing a closure of their fishery and feeling blamed for the resource decline had the lowest satisfaction scores of all groups.

The analysis of five case studies of job satisfaction in fisheries gives an approach to representing objective-material and subjective-perceptual dimensions of well-being of commercial fishermen and some comparator occupations. The graphic representations use data from studies that have been completed since 1974 and have had a job satisfaction focus. In the three studies completed before the mid-1990s, fishermen showed high levels of subjective and objective well-being that fell in the upper quadrant above the 45° line. In the early studies, data fell in the upper right quadrants above the 45° line, showing higher than average satisfaction and material well-being. The two analyses after the mid-1990s showed a decline particularly in subjective well-being. The results suggest the hypothesis that less control over choices among activities, increased management associated with resource decline, competition from farmed fish, powerlessness stemming from being managed or having less control, and being blamed for the condition of the fishery are factors in the decline of subjective well-being (Smith and Gilden 2000; Smith et al. 2000).

The distressed situation in Alaska of commercial fishermen compared to charter boat operators, and the Oregon results, introduce a question about the future of commercial fisheries. Do the five case studies suggest a trend from fishing as an occupation that ranks high in subjective well-being toward fishing having low subjective well-being rankings?

The coho closure example with its overall low job satisfaction score for gillnetters suggests such a trend.

More informative comparisons of fishermen with the situations of non-fishermen would be desirable. The Rhode Island and Alaska cases included data about non-fishing populations. Comparison of fishermen with other occupations would help refine these observations and hypotheses about the factors affecting well-being. Because of the labor-intensive nature of getting subjective measures of people’s perceptions of satisfaction and happiness, the resources are usually not available to make comparisons with other groups.

The general approach is applicable with other activities and to other regions of the world. A material well-being index like that used in the Rhode Island case study can be adapted to any culture and has been used in many cultures (Smith 1991). Likewise, subjective measures of satisfaction can be developed and used in many cultures. Inglehart and Klingemann (2000) combined happiness and satisfaction measures for 65 countries.

With better sampling and use of common measures, the status of other occupations could be better established and compared. The goal should be to explain patterns found for various activities. The case studies reported for North America may not follow the same pattern in other world areas, though job satisfaction studies of commercial fishing in Central America (Pollnac and Ruiz-Stout 1977), Vietnam, Indonesia, and the Philippines (Pollnac, Pomeroy, and Harkes 2001) do suggest common trends for the subjective variable within the occupation of fishing.

We have shown that plotting at least one subjective and one objective measure can be used to evaluate and compare activities at multiple scales and across nations, time, and cultures. While more measures and analysis would be helpful, just the use of an objective material and a self-report on satisfaction tell interesting general and useful specific stories. The case studies show how subjective and objective elements—overall satisfaction and household income—can explain general patterns and specific situations. The effort so far to develop well-being indices has put more emphasis on objective measures. The perceptual, subjective dimension often found in anthropology strengthens solely material indicators and offers more in-depth explanations. The growing literature in developing indices of happiness and well-being may be an area to incorporate in the future. Both the subjective and the objective are important measures for understanding and tracking the impacts of changing conditions and management measures over time.

Notes

¹Following the convention and preference of most English-speaking people who fish, we employ the term “fishermen,” rather than “fishers.”

²The Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA or MSA) was originally enacted as the Fishery Conservation and Management Act (FCMA) of 1976 and was subsequently amended or reauthorized in 1981, 1983, 1989, 1991, 1996, and 2006.

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