Theoretical perspectives on preventing fishing vessel accidents.

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Abstract: Despite the availability of new technologies, fishing vessels come to grief far too often. Prevention education is excessively functionalist and not sufficiently focused on human factors. The author interrogates the problem from contrasting theoretical perspectives and claims prevention educators should embrace subjective as well as objectivist ontologies and place power relations at the centre, not on the margins, of their efforts.

Commercial fishing is a dangerous occupation - one of the worst - and fishers routinely fall overboard, get wound onto net drums, are hit by falling blocks or flaying beachlines and lose hands, arms, and other body parts in winches. From 1976 to 1993 almost 17,000 Canadians were fatally injured in the course of or as a result of their employment. Although fatality rates have been dropping, they remain high in the primary industries. Between 1988 and 1993 113 out of every 100,000 workers in fishing/trapping lost their lives, as compared to 82 per 100,000 in logging and forestry and 63 per 100,000 in mining, quarrying and oil wells. B.C., which has many people likely to be employed in high-risk industries had the highest death-rate at 15 per 100,00 paid workers (Statistics Canada, 1996). Despite the importance of commercial fishing there is a marked lack of research in Canada that could inform prevention programs. Inadequate research easily leads to the adoption of prevention strategies whose adequacy remains untested. There is no shortage of "common-sense" but a lot of programs adopted because it (e.g. handing out pamphlets) fail to withstand theoretical or critical scrutiny.

Education for prevention often involves dispensing "facts." However, it is overly naive to think that once people have the "facts" (about personal flotation devices, flares, liferafts and suchlike) they will change their behaviour in the desired direction. As Festinger (1957) and others demonstrated years ago, people easily reject or rationalize facts if it suits their purposes. Educational facts (e.g. wear a lifejacket) may seem reasonable and stunningly obvious to the educator. But the way they are construed by the recipient, and the extent to which he or she has the power to act on them, will greatly shape the extent to which they are integrated into the learner's frame of reference. It is also naïve to think that the presence of sophisticated equipment (such as navigation aids) necessarily enhances safety. If the fisher is a risk-taker the new GPS enables him or her to cut the corners even finer than before (Geller, 1996). With limited openings, fishers sometimes have to travel at night or confront adverse weather conditions. They must be practical people with a good knowledge of electrical and plumbing systems, hydraulics and a host of other matters. One wrong slip and a person can be overboard or hauled over a net drum or into a winch. This is a "practical" and life-threatening world and it is no surprise that

fishers are not preoccupied with "theory." It sounds "airy fairy" and detached from the so-called "real world." But there is nothing as practical as a good theory. Practice not informed by theory soon becomes random and ineffective and, thus far, there have been few attempts to theorize about fishing vessel accidents or their prevention. Instead of dwelling on weather and equipment, a broad theoretical approach would embrace human dimensions (and the way fishers "read" their world) as well as structures that shape the fisheries, fishing families and the rhythms of fishing operations. Our purpose here is to insinuate structural and human dimensions into discussions typically nested in techno-rational (functionalist) discourses. Our task is to view fishing accidents, and their prevention, from the vantage point of different or alternative theoretical perspectives.

A THEORETICAL MODEL

The model presented below embraces four paradigms that offer different ways of explaining and thus thinking about the prevention of fishing vessel accidents. It rests on a couple of crucial assumptions. One, concerning ontology, is that the way people perceive or construe things is as important as the "objective" world within which they live. The second assumption concerns the importance of power relations (e.g. between skippers and crews, fishers and buyers, men and women on fishing vessels). Some prevention efforts, such as those wherein it is suggested that men listen more closely to women, challenge extant power relationships. The model contains four quadrants bounded by two axes - one concerning ontology, the other concerning power relations. Part of its power is the fact it embraces a broad spectrum of thinking about accidents and their prevention.

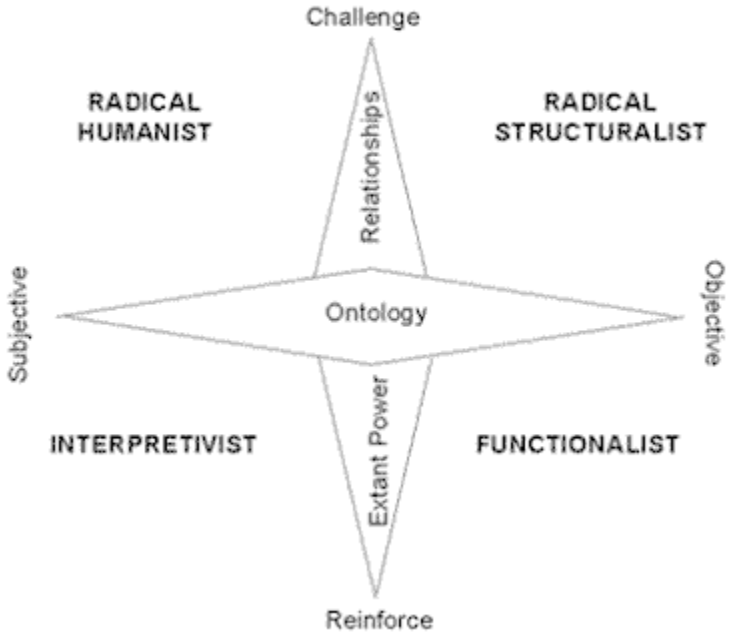

Fig. 1. Model For Constructing Prevention Education

(note: graphic recreated by web designer from original figure shown in published version)

The Axes: The two axes in Fig. 1 lie in an orthogonal (right-angled) relationship to each other. Treat them like latitude and longitude on a nautical chart. The horizontal axis concerns ontology - the essence of phenomena. Accident investigators and prevention educators vary with respect to the extent to which they think there is an objective "reality" - out there - external to the individual. For some, there is an objective world inhabited by lawfully interrelated variables. For others, reality is essentially a subjective phenomenon that exists within consciousness. It exists "in the mind." The vertical axis concerns power and self-interest. Power relationships lay at the centre of fishing vessel accidents and their prevention. Fishing is not a neutral "technical" or benign process. It involves all kinds of struggles - between companies and crews, government and industry, captain and deckhands, male fishers and their wives, fishers and buyers, gear types, ethnic groups and so on. Somebody's interests are always being served when prevention education programs are mounted. The model contains four paradigms that, if adopted, would require different kinds of emphases in the analysis of data secured during casualty investigations and associated prevention education programs.

Functionalism: Functionalism provides an essentially "rational" explanation for accidents. It is the dominant ideology of our time and characterized by a concern for social order, consensus and social integration. Its epistemology tends to be positivist. Functionalists want practical solutions to practical problems and are usually committed to social engineering as a basis for change with an emphasis on gradualism, order, and the maintenance of equilibrium. Functionalists attempt to apply models derived from natural sciences to human behaviour.

Interpretivism: Interpretivists are "subjectivists" in that "reality" is what it is construed to be. Great effort is devoted to adopting the frame of reference of the participant. Social "reality" is a network of assumptions and "shared meanings." The subjectivist ontological assumptions shared by interpretivists stem from the notion that human affairs are ordered, cohesive and integrated. Interpretivists are more concerned with understanding subjectively construed meanings of the world "as it is" than with any utopian view of how it might be.

Radical Humanism: Radical humanists want to upset extant power relationships but are anchored within a subjectivist ontology. Those in this paradigm are usually anti (or "post") positivist. But, unlike interpretivists, radical humanists want to overthrow or transcend existing social arrangements. Many radical humanists employ concepts developed by the young Marx to describe how people carry ideological superstructures which limit cognition and create a "false consciousness" which inhibits fulfillment. Radical humanists want to release people from constraints - which largely reside in their own cognitions. They seek transformation, emancipation, and a critical analysis of modes of domination. They want people to reconstruct their view of reality and take appropriate action. Thus praxis becomes reflection (or reconstruing) followed by action.

Radical Structuralism: Radical structuralists share fundamental assumptions that buttress functionalism but are committed to the overthrow of social structures that build "false consciousness." If radical humanists focus on consciousness and meaning, radical structuralists focus on structures, modes of domination, deprivation, contradictions within an objective social world. Education construed from within a radical structuralist perspective would show how incidents arise from objective socioeconomic circumstances.

WHAT HAPPENED TO *SCOTIA CAPE?*

On January 27, 1987, at 2300 hours, the 189 ton, 36 metre combination seiner/trawler *Scotia Cape* left the B.C. Packers wharf at Steveston, bound for fishing grounds in the Queen Charlotte Islands. There were seven experienced fishers (one of whom was a woman) on board a vessel that had a reputation for big production and excellent wages. Gales were blowing in the Queen Charlotte Islands from January 27, later upgraded to storm warnings from January 29 to February 5. The skipper apparently decided to press on into the storm. After leaving Steveston, the vessel was last sighted in Goletas Channel, near the tip of Vancouver Island, but its exact destination was not known because the master usually kept it a secret.

It was only when *Scotia Cape* failed to contact B.C. Packers at a pre-arranged time that the Rescue Coordination Centre (RCC) was alerted and a search mounted. There was no debris, oil slick or survivors. The master who had survived a capsize and sinking on the *Scotia Bay* on September 6, 1979 was not so fortunate this time. There were numerous other trawlers in the Queen Charlotte's during the time in question but most were at anchor in sheltered waters during the worst of the storm. On January 30th Environment Canada reported storm force winds (60-80 knots) at Solander after which the wind sensor failed. The TSB thus concluded that, although other fishing vessels were also at sea, it was imprudent for *Scotia Cape* to leave sheltered waters in the face of a storm. But, from our perspective this "explanation" is insufficient.

The implications for prevention are now illustrated by positing alternative explanations for the loss of *Scotia Cape.* Each explanation suggests the need for a different focus in prevention programs. Because this large vessel disappeared without trace, and there were no survivors to interview, we largely depend on the TSB investigation but go beyond their analysis and posit explanations, from other than a functionalist perspective. At the centre of the present analysis is the notion that "free surface effect" or a capsize are not the cause, but the result of the accident. The causes (or causes) of this accident were in place and having their effect long before the vessel left Steveston. The task here is to explain the disappearance of *Scotia Cape* from within varied theoretical perspectives. Our task is to raise issues not usually considered in marine casualty investigations and rarely show up in prevention campaigns. In this way we hope to broaden the discourses pertaining to prevention.

Functionalist Perspective: The disappearance of *Scotia Cape* is easily explained from a functionalist perspective and we need look no further than the TSB investigation. First of all, the vessel carried no EPIRB and thus, from the outset, searchers were at a disadvantage. The system for deploying the liferaft was not adequate and, even if the seven crew got into it, the chances of being picked up were jeopardized by the fact nobody had their position. The RCC (1987) report details conversations with family members and fishers on similar boats who claimed that the vessel was most vulnerable while dragging or retrieving nets. If the net got caught on a snag or difficulties developed while retrieving it, this combined with even a moderate sea state, could have an adverse effect on stability and cause the vessel to roll over and sink. In rough seas everything on the deck would be securely tied down so little flotsam would get loose from the sinking vessel. Hence the lack of debris.

Interpretivist Perspective: Storm-force 70 knot winds were forecast. Contrary to popular wisdom, weather forecasting is a fairly exact science and, as predicted, the storm arrived. Did the skipper interpret this as an opportunity to get some uninterrupted fishing on grounds that had previously produced good money for him and the crew? Although he would have preferred calmer seas and didn't enjoy working in waist high water crashing across the deck, previous trips had demonstrated that *Scotia Cape* could take some punishment. Fishers can't be choosy about crew, weather or much else and he had long ago accepted that you "take it as it comes." Others were on the radio whining about weather but, for him, every day spent in shelter was a day wasted. What meaning did crew members ascribe their predicament? This was supposedly a bullet proof ship and they'd been here before. On the other hand *Scotia Bay* had rolled over. But, on that occasion everyone, including their skipper, had a lucky escape. Was it just a matter of being on side with "lady luck?" As waves swept the deck and the vessel rolled and they clung to the gear and railings did anyone come to doubt the wisdom of what they were doing? If so, what was yelled or screamed above the roar of waves and wind? How many of the crew were gripped with panic and immobilized by fear? If the net got snagged to one side and the vessel heeled would they have the mental resources, physical strength or tools needed to cut it free?

Radical Humanist: As *Scotia Cape* got near the tip of Vancouver Island, the radio chatter suggested other vessels had already run for shelter. Some on those on board felt apprehensive about what they were doing, but once having stepped aboard in Steveston, had no way to get off. The master had over 25 years experience fishing in B.C. and, according to the TSB (1987) "had an excellent reputation as a fisherman and master and, although stated to be a cautious person who had considerable respect for the sea, was acknowledged to often fish the vessel in adverse weather" (1987, p. 34). In the pecking order, the master of *Scotia Cape* had a considerable reputation even though his proclivity for staying out in storms was a source of concern. Was this an "individual error" or was the master nested in a male discourse that routinely exposed people to extreme danger? What discourses or dismissive strategies were used to discount apprehensions on the ship? To what extent were the interactions that preceded a capsize nested in sexualized

("you've got no balls ... you want to fuck us out of payday?"), homophobic ("if you girls don't want to be here, swim ashore ... ") or similar discourses? Were the men on board concerned that running for shelter would have earned them the label sissy or wimp? What was the role of the only woman aboard, who occupied the often difficult and ambiguous role of cook? In the gendered and overwhelmingly male dominated culture of a large fishing vessel did she have any power at all?

Radical Structuralist: Fishers enact their lives within a web of class relations. In this case the most salient concerned the relationship between the owner and the crew. The second set concerned "false consciousness" - fictional notions of social mobility that impelled the crew search for big wages. B.C. Packers is a large corporation incorporated in 1928 but with roots that go back to 1902. Their famous "Cloverleaf" trademark was acquired in 1908. Today B.C. Packers is the largest processor of seafood in British Columbia and many canneries built last century are owned by this large conglomerate. *Scotia Cape* was valued at more than $1 million yet this corporation had somewhere neglected to purchase and install an EPIRB or an auto alarm. What aspects of the organizational culture at B.C. Packers created a situation where large company vessels were sent into storms without this equipment and, if this was the pattern, what norms and expectations surrounded the maintenance of winches, blocks, nets and the rest of the machinery on company vessels? How could this corporation justify the contradiction of sending ill equipped vessels to sea while, at the same time, flying a company aircraft? From a Marxian or Radical Structuralist perspective the skipper and crew died because of predatory capitalism and the historic tendency of corporate elites, snug in warm offices and safe on shore, to abuse workers at sea. From this perspective the accident arose from unequal and exploitative class relations. The capsize, the fluids slopping in the tanks (the "free surface effect") were a result, not a cause of the accident. In this case the cause resides in the exploitative indignities of capitalism and predatory instincts of corporate elites in the B.C. fishing industry.

PREVENTION EDUCATION

Training to Education: Prevention education programs informed by Interpretivist, Radical Humanist, Radical Structuralist as well as Functionalist perspectives would involve education rather than training. "Training" denotes a fixed content and the notion there is a consensus concerning "correct" procedures. The focus is on course content (e.g. collision regulations) which is usually contained in ring-binders and trotted out year after year. An educational approach that has regard for the socio-cultural backgrounds of the learners, places power relationships in the foreground and would involve use of participatory techniques, large amounts of group work, and the skillful use of case studies (e.g. *Scotia Cape*). The metanarratives (e.g. collision regulations) would not be abandoned. Rather, they'd be incorporated into more participatory formats that respect learners and value their experience.

Program Content: Programs nested in the three alternative perspectives would involve examination of issues arising from the socio-cultural backgrounds and cognitive perspective of learners. Power relations, the sociology of the fisheries, would be in the foreground. Gender politics and "macho-male" behaviour would be in the foreground. Instructor's would give up the idea there is only "one way" to secure safety. Instead, there would be adequate regard to the highly differentiated nature of the fishery and the fact a modest two-man crabbing operation cannot be compared to a 14-man offshore dragger. In the language of postmodernism, instructors would abandon metanarratives in favour of a more fluid and differentiated approaches shaped to meet the needs of learners from different ethnic groups, gear types and positions of power and powerlessness. Prevention programs based on a functionalist (i.e. techno-rational) analysis of fishing vessel accidents usually involve "dispensing information" or "facts" about piloting, fishing practices or equipment. They also tend to be Eurocentric and place white, English-speaking persons at the centre. Asian-language speaking persons are the "other" who get hectored about learning English and doing things the "Canadian" way (as if there's some Canadian "essence"). Ideally, much program content will be drawn from the experience of ethnically-defined fishers in different gear types. More fishing vessel accidents would be prevented if educators also adopted an ideology of adult education (instead of training). Education programs nested in the theoretical perspectives described here would contain heavy leavenings of psychology, anthropology, sociology and other social sciences. Investigators and educators would stretch beyond ergonomics or "human factors," let alone collision regulations and emergency duties. Alternative approaches would involve discussion of gender, ethnicity and the different norms and understandings held by trollers, seiners, gillnetters, crabbers and so on. There would be a concerted study of socio-political factors (structural relations) that shape fishing operations and influence safety.

Program Processes: In the recommended prevention education program there would be fewer lectures - where the instructor lays out his or her perspective - and more group work, discussion, role plays, and simulations where learners bring forward their experience and perspectives. The fisher's stories - about near misses and big hits - would be shared and analyzed in systematic and theoretically focused ways. Instructor's would make more lavish use of case studies but, instead of just "telling" learners about incidents, would employ participatory techniques that unmask different ways of interpreting "findings" found in casualty investigation reports. If TSB investigators can imbue their reports with a socio-psychological and socio-cultural perspective they will be even more useful for training purposes than at present. The case study, long a technique favoured by adult educators, is very potent with fishers because, in many instances, the learners knew the deceased whose names appear in the report and most are familiar with the circumstances (e.g. rough weather, the pressure of competition, taking a short cut) that immediately preceded the accident being studied. Prevention education programs informed by Interpretivist, Radical Humanist, Radical Structuralist as well as Functionalist perspectives would involve use of techniques that elicit and make use of the learner's background and experience. Because the fishing fleet is highly differentiated, content would be adapted to local

particularities. Prevention education processes would be participatory, involve fewer lectures and more active collaboration with learners.

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