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CHAPTER 10

QUALITATIVE AND QUANTITATIVE METHODS IN OCCUPATIONAL-STRESS RESEARCH

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ABSTRACT

The paper examined the ways in which qualitative and quantitative methods support each other in research on occupational stress. Qualitative methods include (a) eliciting from unconstrained descriptions of work experiences, (b) careful first-hand observations at the workplace, and (c) participant-observers describing “from the inside” a particular work experience. The paper shows how qualitative research stimulates theory development, hypothesis generation, and the identification of job stressors and coping responses. The limitations of qualitative research, particularly in the area of verification, are also described.

The purpose of this paper is to advance the idea that qualitative methods and more highly controlled quantitative methods applied to occupational-stress research, together, can provide a clearer picture of the stress process. Plewis and Mason (2005) wrote that quantitative and qualitative methods represent “mutually informing” strands of research. Hugentobler, Israel, and Schurman (1992) underlined the view that every method has weaknesses, and that by applying manifold methods to the study of occupational stress, weaknesses in one method will be compensated for by strengths in other methods. They go on to show how qualitative and quantitative methods converge in identifying the sources of stress in workers in a manufacturing firm. Qualitative research, moreover, can be useful to quantitative researchers in instrument development (Blase, 1986; Schonfeld, 2006b).

Qualitative methods, particularly methods associated with grounded theory (Glaser & Strauss, 1967), emphasize the emergence from data of theoretically important categories as well as hypotheses bearing on the relations among those categories. There is no dearth of literature on using multiple methods (Cresswell, 2003; Tashakkori & Teddlie, 2003). Smith (2006), justifying the application of multiple methodologies in educational research, points out that “any methodology has inherent deficiencies and fails to capture the chaos, complexity, and contextuality of applied fields such as education” (p. 458). We would add the field of occupational-stress research. Methods must fit the research questions. It is appropriate to use survey methods, for instance, when one wants to quantify variables in the occupational-stress context. To characterize descriptively the intensity of work-related stressors experienced by individual workers, however, qualitative methods may be profitably used (Jex, Adams, Elacqua, & Lux, 1997).

There are at least three types of qualitative methods that have been employed in occupational-stress research. The first, and most commonly used, method involves having members of occupational groups describe, in their own words—in writing or orally—their everyday work experiences. This type of method has been applied to a variety of occupation roles (Browner, Ellis, Ford, Silsby, Tampoya, & Yee, 1987; Büssing & Glaser, 1999; Carradice, Shankland, & Beail, 2002; Dewe, 1989; Dick, 2000; Gomme & Hall, 1995; Goodwin, Mayo, & Hill, 1997; Hugentobler et al., 1992; Hutchinson, 1987; Isaksen, 2000; Jex et al., 1997; Kahn, 1993; Keenan & Newton, 1985; Khowaja, Merchant, & Hirani, 2005; Kidd, Scharf, & Veazie, 1996; Lee, 1998; MacDonald & Korabik, 1991; Maki, Moore, Grunberg, & Greenberg, 2005; Mears & Finlay, 2005; Molapo, 2001; Noonan, Gallor, Hensler-McGinnis, Fassinger, Wang, & Goodman, 2004; Polanyi & Tompa, 2004; Reid et al., 1999; Tewksbury, 1993; Tracy, Myers, & Scott, 2006; Weyman, Clarke, & Cox, 2003) including that of teachers (e.g., Blase, 1986; Blase & Pajak, 1986; Engelbrecht, Oswald, Swart, & Eloff, 2003; Farber, 1991; Farber, 2000; Ginsberg, Schwartz, Olson, & Bennett, 1987; Griffith & Brem, 2004; Mykl-

etun, 1985; Schonfeld & Ruan, 1991; Schonfeld & Santiago, 1994; Smith & Smith, 2006; Steggerda, 2003; Younghusband, 2008). In this type of qualitative research, workers' descriptions of their working conditions would not be constrained to fit the response alternatives found in structured interviews and questionnaires, the stock-in-trade of quantitatively oriented occupational-stress investigators.

The second method involves investigators who situate themselves in a workplace (without obtaining a position in the workplace), and observe, first-hand, workers on the job (e.g., Ginsberg et al., 1987; Gomme & Hall, 1995; Kahn, 1993; Kaiman, 1994; Molapo, 2001; Tracy et al., 2006). The third method involves participant observation. Here the researcher obtains the kind of job (Browner et al., 1987; Hutchinson, 1987; Mears & Finlay, 2005; Palmer, 1983; Tewksbury, 1993; see particularly Sachar, 1991) that he or she intends to study, and describes elements of the occupational stress process from the inside. Sometimes the participant observer obtains a partial work role that includes some but not all job tasks (Browner et al., 1987; C. H. Browner, personal communication, September 20, 2007). Although this first-hand experience on the job provides an insider's perspective, participant observers, like the investigators in the second category, also closely observe other workers first hand. Although some investigators label as participant observation, scrutiny at close quarters without necessarily occupying the same occupational role as the workers under study (e.g., Gomme & Hall, 1995; Tracy et al., 2006), we do not.

Teaching is a particularly stressful occupation because the profession is built on a fundamental conflict, namely, the tension between the socializing agent and those being socialized (Mykletun, 1985). The examples to follow will show how qualitative research helps to add theoretical depth to findings obtained from a longitudinal study of new teachers. The qualitative research includes teachers' descriptions of their jobs and a participant observer's description of her year as a junior high school math teacher.

A QUANTITATIVELY ORIENTED APPROACH TO MEASURING STRESSFUL SCHOOL CONDITIONS

To describe how qualitative research is utilized in a research program devoted to teachers, we first briefly describe the series of quantitatively oriented studies and measurement concerns related to those studies. Within the framework of two cross-sectional studies of veteran teachers (Schonfeld, 1990, 1994) and one longitudinal study of newly appointed female teachers (Schonfeld, 1992a, 2001), one of us developed self-report instruments that were designed to assess teachers' exposures to adverse working conditions.

The occupational-stress scales have solid measurement characteristics. The alpha coefficients of scales measuring episodically occurring work events and ongoing job conditions were satisfactory. In the veteran- and new-teacher samples, the occupational-stress scales were more highly related to each other than they were to a measure of non-work stressors. In the longitudinal study of new teachers, workplace scales administered during the fall term demonstrated convergent and discriminant validity: the fall-term workplace measures were more highly related to spring-term depressive symptoms and job satisfaction four and a half months later than to summer, pre-employment depressive symptoms and anticipatory levels of job satisfaction, measured four and a half months earlier (Schonfeld, 2000). Compared to other measures found in the occupational stress literature, the teacher stressor measures were relatively uncontaminated by negative affectivity or prior psychological distress (Schonfeld, 1992b, 1996).

Like qualitatively oriented researchers, quantitatively oriented investigators are concerned with the richness and informativeness of the data they collect. Quantitatively oriented investigators have shown great concern about the value and accuracy of both "objective" and self-report data, and have thought carefully about the best ways to ensure the validity of quantitative data (Frese & Zapf, 1994; Kasl, 1987). In view of these considerations, one of us secured official, objective data bearing on the quality of the workplaces of the new teachers who were employed in New York City public schools. The data included the school-by-school rates of assaults, robberies, and sex offenses against teachers. One of the project's aims was to link the official data, which were independent of the responses of the New York City participants in the longitudinal study, to various outcome measures, including depressive symptoms and job satisfaction. Interestingly, the objective data proved to be of little merit. An audit of the official data revealed widespread underreporting by administrators who were charged with officially recording and aggregating crimes occurring in the City's schools (Dillon, 1994); the problem of underreporting violent incidents continues to occur in New York City schools (Gootman, 2007) and across the country (Schonfeld, 2006a). Information (Sachar, 1991; Schonfeld, 1992b) obtained independently of audits was consistent with the view that there is serious underreporting of violent incidents. This situation amounted to an instance in which self-report data that became part of the abovementioned episodic and ongoing stressor scales were of superior quality than so-called objective data.

The longitudinal research on new teachers identified sizable mean differences in depressive symptoms and job satisfaction among new women teachers confronting different levels of adversity in working conditions (Schonfeld, 2001). Teachers who frequently faced highly aggressive and defiant youngsters were considerably more likely to show higher depres-

sive symptom levels and diminished job satisfaction compared to their colleagues who worked in more pacific circumstances. Importantly, these differences were largely independent of the women's (a) pre-employment symptom profiles, (b) anticipatory levels of job satisfaction measured prior to their entry into the teaching profession, and (c) stressors occurring outside of work.

QUALITATIVE DATA THAT ENRICH THE QUANTITATIVE DATA

As a supplement to the longitudinal study, the new teachers were given an opportunity to write, with no constraints, about their work experiences. As the longitudinal study progressed, hundreds of pages of the teachers' written descriptions of their work lives accumulated.

Given the labor required by the quantitative side of the research, a quantitatively oriented investigator may initially view qualitative research as an interested spectator; it is something best done by ethnographers who seek to describe diverse subcultures. By contrast, the research activities of a quantitative investigator are best devoted to scale construction, power analyses, the writing of computer programs to identify response sets, etc., in adherence to the methodological canons of quantitative research. How does one assess the reliability of workers' characterizations of their phenomenal worlds? Despite the difficulties involved in "processing" the qualitative data, a reading of the teachers' descriptions proved to be highly compelling and demanded a closer look.

The qualitative data collected to supplement the quantitative research on new teachers provided a detailed examination of the transactions occurring in schools (Schonfeld & Santiago, 1994). These data vividly depict the working conditions that give rise to psychological distress in teachers. For example, a former elementary school teacher, a participant in the longitudinal study, wrote:

I loved the teaching profession but because of my experience at P.S. xxx I doubt I'll ever teach again. If I do, it will not be for the New York City Board of Education. My present job requires me to work many more hours and much harder but I am a much happier person. The stress caused by teaching a rough class is incredible. I used to come home crying every night.

Crying can be construed as a symptom of depression; it is captured in items on the Center for Epidemiologic Studies Depression Scale (Radloff, 1977) and the Depression subscale of the SCL-90 (Derogatis, Lipman, & Covi, 1973). This teacher's words and the words of many other teachers

richly describe the human context to which the quantitative findings pertain. Consider the words of the following elementary school teacher:

The students in my school are physically violent. It seems that fighting is the only solution to their problems. I was previously working in this school as a substitute teacher. It is discouraging and depressing to me to see that even first graders are fighting. There seems to be no love, friendship, or caring going on among the students.

Notice that she used the terms “discouraging” and “depressing” to describe how she feels about the student-to-student transactions she observed as part of her job. The longitudinal study found that teachers in the most dangerous, worst-run schools manifested high levels of depressive symptoms (Schonfeld, 2000).

Also consider the fear in the next teacher and its impact on her health and life decisions:

One of the worst classes I have is a fourth grade Gates class¹ in which the children are around age 13. They are very rough children and I have to break up fights regularly. Last week as I was getting the children ready to be dismissed, an object which looked like a gun fell out of a child's pocket. I was in a panic until the boy picked it up turned it over and it was red and purple. In this class I would not have been surprised if it were a real gun. Weapons are constantly being taken away from children in this class. Also lately there has been a big security problem in the building. Several times intruders have entered the building. Last week children reported being threatened by a man with a knife and a gun. Since I have been teaching my health has declined. I am constantly sick with whatever the kids have and I have developed an ulcer-like condition. Last year I was perfectly healthy. I have decided that since I have the grades, in two years I will start law school.

Participant-observer research, another form of qualitative research, also sheds light on teachers' working conditions. Emily Sachar (1991), who had been a journalist, left her job at a newspaper to obtain a teaching position in one of New York City's more chaotic schools, Walt Whitman Junior High School in Brooklyn. As a participant observer, she wrote what amounts to an ethnographic account of one year in the life of a mathematics teacher. She described a high level of day-to-day disrespect and insult:

My problems with Jimmy promptly worsened. By the third week, he had a ritual prank—raising his hand constantly to pose questions that had nothing to do with class work. I fell for the bait every time. His questions were tame enough at first. “Mrs. Sachar, could I get a drink? I'm gagging in my throat,” or “Mrs. Sachar, how about a night of no homework?” Their innocent tone did not last long. One day after waving his hand frantically, Jimmy asked,

“Mrs. Sachar, where do babies come from?” Calmly I told him to ask his health instructor. Another day he tried, “Mrs. Sachar, do you like sex?....Do you have orgasms, Mrs. Sachar?...Do you masturbate Mrs. Sachar?” (pp. 76-77)²

This student was not a rarity.

Later Sachar (1991) wrote:

We were not officially informed of the gun incident until the monthly faculty conference on January 23rd [about three weeks after the incident occurred]. Then we learned that one student had been inches away from death in the accident. Winfield [the principal] told us that a twelve-year-old boy had brought a loaded gun to school, and that it had accidentally fired in class. The bullet tore a large hole through the coat of a girl standing next to him, then ricocheted off a desk. “If the girl had larger breasts, they would have been eliminated,” Winfield said, “and if she’d been turned in another direction, she’d probably be dead.” (p. 146)²

Despite the seriousness of the situation, the principal’s flippancy is evident. Sachar (1991) went on to write:

This was only the first of a series of weapons incidents. In February, one dean told me, a sixth-grade girl hit another student over the head with a hammer and was suspended for five days. A few days later, another sixth-grader brought a custom-made .410-gauge shotgun to school, and was arrested. The boy had borrowed the weapon from his fourteen-year-old brother, a drug dealer, to scare another kid at school who was “giving him trouble.” A detective from the local precinct said that the boy showed no remorse: “He was quite callous, in fact.” (p. 146)²

To compound problems like these, Sachar (1991) noted that many administrators were not forthcoming in helping the teachers tackle classroom management problems. On the other hand, Sachar (1991) observed that the administrators tended to squelch reports of school violence.

Qualitative material from Barry Farber (1991) in his book on teacher burnout depicts a young idealistic teacher working in an inner city school. Farber described her incessant problems controlling her class, the lack of help from an otherwise “caring” principal, and how “beat” she felt at the end of the day.

Sachar (1991) also described the physical toll of the job including exhaustion and other bodily complaints. She wrote, “I phoned this teacher on a Sunday to chat about the coming year and to gossip a bit about the school administration.

“‘I’m in the midst of a diarrhea spell,’ he said.

“What’s wrong? Did you eat something bad?”

“You know what’s wrong,’ my friend said. ‘I’ve got to go back there in two days.’

“This was a veteran teacher with a good reputation at Whitman, a man whose company I cherished during the year.” Later the man reports “I feel helpless. You have a principal who says the school is great when the school stinks. He tells you about all these great programs that exist” (p. 215).² Other teachers spoke of chronic depression.

MAKING SENSE OF QUALITATIVE DATA

Given the wealth of descriptive material gathered from the new teachers in the longitudinal study, the project needed a method for categorizing the teachers’ writings. Brenner (2006) suggested an analytic framework for interview data consisting of five phases: transcription, description, analysis, interpretation, and display. Although she presented them as a linear progression, she emphasized that working with data is often a cyclical process. In this case, the transcription was relatively easy since the data were already written.

For the qualitative data collected in the longitudinal study, a provisional set of themes emerged “naturally” from the new teachers’ writings according a method described by Farrell (1990). The readers’ goal was to adhere to the principle that no preconceived theory guide this stage of the qualitative research, the readers following the groundbreaking dictum of Glaser and Strauss (1967) who advanced the view that theory arise from the data. Of course, the idea that important categories emerge from data is idealized. Popper (1963) underlined the fact that “observation is always selective,” and that so much of what one observes is presupposed by a host of factors. Nonetheless, qualitative methods have a role to play in occupational-stress research.

It should, of course, be noted that qualitative researchers dispute positivist social scientists on the role of methodology. Kirk and Miller (1986) maintain that quantitative definitions of reliability and validity are rarely appropriate to the way qualitative researchers work. They argue for a theoretical rather than an apparent validity. They are less charitable when discussing reliability, calling a single method of observation continually yielding an unvarying measurement a quixotic reliability. They support linking the two concepts while realizing that there are tradeoffs between them when conducting qualitative research. Qualitative researchers lean toward validity as the more important concept with experimental controls and triangulation to increase objectivity (cf. Goodwin et al., 1997; Hugentobler et al., 1992; Kidd et al., 1996).

Notwithstanding Kirk and Miller's (1986) admonitions about reliability, Schonfeld and Santiago (1994) needed a way to make sense of hundreds of pages of teachers' descriptions of their working conditions that were collected in the context of the longitudinal study. After the initial content analysis, the two readers independently read through a series of about 75 writings, categorizing the writings by the provisional set of themes. After the readers examined their disagreements, they slightly altered the categorical scheme. The readers then proceeded to classify another series of about 75 descriptions using the revised scheme, checked how reliably they classified the writings, and made additional adjustments in the categorical scheme based on the location of disagreements. They blindly and incrementally refined the initial set of categories. With the final set of categories, the pair of readers obtained coefficient *kappas* (Cohen, 1960) of .79 or greater for every category, indicating a satisfactory level of inter-rater agreement. *All* the teachers' writings were reread and sorted on the basis of the final categorical scheme.

With rare exceptions (Isaksen, 2000; Keenan & Newton, 1985; Kidd et al., 1996; MacDonald & Korabik, 1991; Schonfeld & Santiago, 1994), among the 40 qualitatively organized studies of occupational stress that the authors reviewed, most investigators neglected to apply *kappa* to assess the reliability of their results. Kidd et al. (1996) reported on a validity check that involved the successful application of their agricultural stressor coding scheme, which they developed for one sample of farmers, to another farm sample. Goodwin et al. (1997) developed a validity check by having (1) salespersons scrutinize the transcripts of their responses to a semi-structured interview and (2) outside experts review transcripts and codes in this research on salespersons' responses to a major job stressor. Although most qualitative research is, by definition, interpretative (Erickson, 1986; Farrell, Pegero, Lindsey, & White, 1988; Rabinow & Sullivan, 1987), we suggest that some of the tools (e.g., *kappa*) employed by quantitative researchers can be used to strengthen qualitative research.

FOUR THEMES EMERGE FROM THE TEACHER DATA

Four categories emerged from the new teachers' descriptions: (a) interpersonal tensions and lack of support among colleagues/supervisors, (b) happiness with one's job, (c) violence and other security problems, and (d) classroom management problems. Teachers' descriptions sometimes reflected more than one theme. The themes illuminate problems with which quantitatively oriented occupational-stress researchers have grappled. The first two themes to emerge from the teachers' writings accord with quantitative research literature on social support. Many new teachers described

their distress when supervisors absented themselves from the supervisory role or when they obtained jobs in schools characterized by interpersonal tensions among the faculty or between faculty and administrators. By contrast, when new teachers reported being happy with their jobs, they often described the importance to their well-being and success in managing a classroom, of good relationships with colleagues and supervisors. For example, a fourth-grade Catholic school teacher wrote:

Where I work the teachers are very close. They help each other when help is needed. There is only one [other] teacher who is also teaching for the first time and we are close. We usually talk about school and our own personal life but we don't do any recreation together.

Although some parochial schools offer important clues for improving public schools (Bryk, Lee, & Holland, 1993), the above teacher went on to complain about the difficulties she experienced in making ends meet because she earned a considerably lower salary than her public school colleagues. In general, when teachers expressed satisfaction with their jobs, they tended to mention reliable colleagues and administrators who were available to help them (Schonfeld & Santiago, 1994).

The theme of violence in the schools is particularly troubling. Violent and overly aggressive behavior is often evidenced in qualitative research on teachers (Engelbrecht et al., 2003; Ginsberg et al., 1987; Schonfeld & Santiago, 1994; Smith & Smith, 2006; Steggerda, 2003; Younghusband, 2008). Teachers reported on the personal consequences of having been victimized by violent students. Teachers also reported being affected by the *prospect* of violence even on occasions in which student violence was not in evidence. For many teachers, violence often seemed to be lurking. The picture is troubling enough to warrant public health concern.

Apart from the violence, teachers described having students who were verbally, if not physically, assaultive (recall Sachar's Jimmy). The disruption caused by the behavior of some children sabotaged lessons, causing teaching to proceed haltingly, in a stop-and-go manner, if at all. Thus even if teachers did not become victims of violence, they had to be concerned about being targets of endemically disrespectful behavior that makes managing classrooms difficult.

The qualitative findings just described suggest that if the qualitative and quantitative research traditions can be linked, a truer, more rounded picture can emerge of what it is like to work in a variety of school environments and the consequences those environments hold for teachers. The qualitative findings provide a context for the discovery (Reichenbach, 1951) of insights that contribute to a theory of job stress. Sachar's (1991) participant-observer investigation and Schonfeld and Santiago's (1994) study of

teachers' descriptions of their jobs provide insights into why working in some schools may be normatively stressful. Although there are a number of different models of the stress process (Dohrenwend & Dohrenwend, 1981), a model of the stress process to emerge from the qualitative findings from both the longitudinal study and from the work of Sachar (1991) dovetails with Dohrenwend's (1979) pathogenic-triad theory of stress.

Dohrenwend (1979), in reviewing research on extreme situations, found that stressful life events can engender psychopathology in individuals in whom evidence of psychopathology had previously been absent. This is not to argue that teachers are in a position similar to that of combat infantry. Research, however, suggests that combinations of undesirable life events are particularly toxic when such events (a) are unanticipated, unscheduled, and outside the individual's control; (b) lead to physical exhaustion; and (c) reduce social support. The elements of Dohrenwend's (1979) theory of stress are well illustrated by the above examples. Clearly many teachers are affected by a dangerous level of violence in the schools that is a cause for anxiety.

It is, moreover, unlikely that academically trained individuals seeking entrance into a profession would foresee violence and endemically discourteous and disrespectful behaviors as everyday working conditions. Louis (1980) highlighted the demoralizing effect of the unrealistic expectations many new workers bring to their jobs. By contrast, among individuals entering the teaching profession only to work in the most chaotic and threatening schools, commonplace expectations regarding workplace safety and respect are not met (also see Steggerda, 2003).

Qualitative findings of the longitudinal study, more than the quantitative results, underscore the *shock* and uncontrollability of teachers' encounters with aggressive students (Schonfeld & Santiago, 1994; Smith & Smith, 2006), showing the applicability of Dohrenwend's (1979) theory of stress to teaching. Sachar's (1991) participant-observer findings also highlight this sense of shock in encountering so much violence and disrespect as a normal and, too often, uncontrollable part of one's work role. The sense of violence and shock is illustrated by an incident, this time occurring in the neighborhood of Sachar's (1991) school, in which one Walt Whitman student, who began by bullying another Whitman student, set the other student on fire, severely burning, and almost killing, the victim. The appalling event brought to mind the words of the school's namesake, "I mourn'd, and yet shall mourn with ever-returning spring."

Some of the above described qualitative findings highlight another element of the pathogenic triad. Although examples cited earlier suggest that exhaustion can accompany the job, such exhaustion does not betray ill conditioning on the part of the teacher incumbent. One new male teacher, who had contributed qualitative data to a pilot study, had been an intercollegiate trackman and cross-country runner. He obtained a job in a New

York City junior high school in which only a small proportion of students read on grade level. He reported going to sleep just after he got home from work at about four o'clock in the afternoon. He attributed his fatigue to two sources: the energy he expended trying to maintain order within his classes and the piercing noise, as manifest in students' loud talking and yelling, that permeated the school building throughout the day. One of the school's deans, a former starter on a major college football team, evolved into a three-pack-a-day chain smoker.

As mentioned earlier, teachers in the longitudinal study who reported satisfaction with work often indicated that collegial relations with coworkers and, sometimes, administrators contributed to that sense of satisfaction. By contrast, other beginning teachers who participated in the longitudinal study complained about being cut off from their more senior colleagues. They described administrators who rarely helped them develop the skills required to manage classrooms. Sachar (1991) described a principal who rarely helped new teachers adjust to the classroom, frequently isolating himself in his office, and a dean who seldom helped teachers with the violent students who were his responsibility to discipline; the principal's lack of involvement continued for years after Sachar left the school, ending only when he was relieved of his job owing to his inaction over a case of sexual molestation (Steinberg, 1997). Events and conditions that deny the individual support are part of the pathogenic triad.

Sachar's (1991) insider's description of an urban public school and qualitative data from the longitudinal study pointedly indicate that many of the difficulties teachers encounter come as a package, if not as a triad. One observes in the same school many troubled and violent students who block effective instruction for all students as well as imperil everyone's safety, administrators who do not extend themselves to help teachers gain skill and competence, and a generally poorly managed, isolating, dirty, and noisy environment, a workplace from which teachers return home drained. Qualitative research thus paints a picture that suggests that some school environments are quite toxic to any teaching candidate with ordinary expectations about starting out in an honorable profession.

THE STRENGTHS AND LIMITATIONS OF QUALITATIVE AND QUANTITATIVE RESEARCH

Qualitative research will not help investigators test hypotheses derived from theory, nor of course is it meant to. The history of science, however, indicates that the strength of qualitative observation—we include uncontrolled, practical observation—is in theory development and hypothesis generation. We highlight four examples from diverse areas of medicine to

underline this point. We chose medicine because of the value the research has had for the well-being of large numbers of people. First, *en route* to mankind's conquest of smallpox, what might termed qualitative observations, often made by ordinary people long before Jenner's discovery of a vaccine, suggested the proto-hypothesis that inoculating susceptible individuals with small amounts of secretion from the pustules of affected individuals affords the inoculees immunity from the disease (Hopkins, 1983; Razzell, 1977). This experience contributed to the development of a theory of contagion, and helped undermine rival humoral theories of smallpox (Miller, 1957).

Similarly, the experience of sailors dating back to the time of Francis Drake suggested that fresh fruit, particularly citrus fruit, prevents and cures scurvy (Carpenter, 1986). Carpenter (1986) showed that from the beginning of the seventeenth century, the men of the Hudson's Bay Company kept scurvy to a minimum by sending small amounts of lime juice with its crews. We can call this an action hypothesis based on qualitative observational data. When fresh vegetables were unavailable, fresh game supplied by Hudson's Bay hunters throughout the year, kept scurvy at bay. In the eighteenth and nineteenth centuries there were a number of ill conceived theories of the disease (e.g., cold moist climates, potassium deficiencies) that led to ineffective treatments and preventive measures. Later, highly controlled research, built upon the clues provided by earlier uncontrolled observation, linked vitamin C to the prevention of scurvy.

The discovery of fluorides' protective effects began with uncontrolled observations by dental practitioners who first described brown mottled tooth enamel in children living in a region of the Rocky Mountains (Black & McKay, 1916). Black and McKay (1916) believed they identified a new kind of dental pathology, noting the "general evil effect of the countenance of the individual" (p. 142). They observed that the amount of mottling was directly related to the age at which each child entered the region and that "as to caries, the teeth of these children compare favorably with those of other communities where endemic mottled enamel is unknown" (p. 145). More than ten years later the mottling was linked to the presence of fluorides in the drinking water as well as to a lower incidence of dental caries (Ainsworth, 1932). These early observations paved the way for controlled hypothesis-based research on the protection from dental caries fluorides afford (Ward & Miller, 1978).

In psychiatry, uncontrolled, clinical observation first identified infantile autism (Kanner, 1943), a syndrome reflecting "the presence of markedly abnormal development in social interaction and communication and a markedly restricted repertoire of activity and interests" (American Psychiatric Association, 1994, p. 66). The syndrome is distinct from other debilitating mental disorders including schizophrenia. Kanner's case study description of the syndrome has been well supported in the research literature (Rim-

land, 1964; Rutter & Schopler, 1979). Kanner's description of the very-early developing and highly unusual behavior associated with the disorder has suggested an organic cause (Rimland, 1964).

These examples from the history of science emphasize, albeit in different contexts, an idea underlined by Kidd et al. (1996), namely, that "qualitative methods are preferred to quantitative methods when there is little information known about a phenomenon, the applicability of what is known has not been examined, or when there is reason to doubt the accepted knowledge about a given phenomenon" (p. 225; cf. Goodwin et al., 1997). By contrast, when qualitative methods are employed in a field that has been well explored, it is likely that the theoretical insights that emerge from the data will make contact with existing theories.

Popper (1963) was right about the selective nature of observation. It is too unrealistic to hold to the view that theory will emerge from qualitative data untainted by the investigator's prior exposure to existing theory and research findings. For example, in research on stressors affecting farmers, a coding scheme for stressors was developed based on a coding dictionary developed from the extant literature on agricultural stressors (Kidd et al, 1996). Blase (1986; Blase & Pajak, 1986) in his qualitative research on teachers found that work overload is a prominent stressor although the quantitatively oriented literature has viewed overload this way in research antedating his. Despite adhering to the Glaser and Strauss's (1967) canon of letting theoretically important categories emerge from the data, Goodwin et al. (1997), in one of the methodologically soundest qualitative studies we reviewed, found problem- and emotion-focused coping strategies in salespeople's responses to major account loss, coping strategies long known to the quantitatively oriented investigators. Schonfeld and Santiago (1994) anticipated stress-related themes as best they could but "took care to avoid imposing [existing theory]" on the data. Schonfeld and Santiago were aware that they should enter the qualitative phase of the research with an open mind and let themes and theory emerge from the data *à la* Glaser and Strauss (1967); they were nonetheless aware of the existence of Dohrenwend's (1979) pathogenic triad as well as other models of the stress process. There is thus an unavoidable tension in qualitative research.

There are two other limitations to qualitative research that need to be mentioned. One is the problem of reactivity. People who are observed sometimes change in response to the presence of an observer (Shai, 2002). The second is the concern that the researcher may overidentify with the workers being observed. The first author was once a mathematics teacher, and was concerned about the potential for his overidentifying with teachers, which in turn would affect his interpretation of the qualitative findings. One way to at least partly overcome these limitations is through the deployment of multiple observers and multiple interpreters, and the subjecting

of hypotheses generated by qualitative research to rigorous testing using quantitative methods.

Qualitative research nonetheless is valuable, even in fields where much is already known. Insights from qualitative research can call attention to new ways of categorizing data when the data are relatively unstructured (Blase & Pajak, 1986). Even in well trodden avenues of research, qualitative methods can provide surprising new ideas. Qualitative methods can identify important occupational stressors that research has overlooked. For example, incidents involving time wasting among engineers (Keenan & Newton, 1985) and difficulties women managers have in motivating subordinates (MacDonald & Korabik, 1991) are stressors that previous research had missed. Qualitative research has helped to identify coping responses such as self-care activities in nurses (Hutchinson, 1987) that previous research has missed. Whether in well-studied areas or new areas of research, qualitative methods can help investigators understand the meaning and intensity stressful incidents hold for workers (Dewe, 1989; Dick, 2000; Isaksen, 2000; Jex et al., 1997; Polanyi & Tompa, 2004; Steggerda, 2003), helping to lay a foundation for hypothesis testing and scale construction in quantitative research.

It should be noted that both quantitative and qualitative data have been misinterpreted. Gould (1981) gives myriad examples of the former happening in his survey of the early research on human intelligence and race. An example of the latter error comes from Kanner (1943, 1949) who described the parents of autistic children as extremely cold and undemonstrative; in the popular press he went as far as to describe them as “just happening to defrost enough to produce a child” (The child is father, 1960, p. 78). Even if Kanner’s observations were accurate, quantitative research shows that the observations would only apply to Kanner’s clinical sample, and would be unrepresentative of the population of parents of autistic children.³ A good deal of theorizing followed Kanner’s papers suggesting that parental personality and behavior contributed to the etiology of the disorder (Cantwell, Baker, & Rutter, 1979; McAdoo & DeMeyer, 1979). Although the preponderance of evidence from rigorously designed, quantitatively organized studies is much more compatible with biological than psychological causal theories of autism (Dawson & Castelloe, 1992; Dawson & Osterling, 1997; Rutter & Schopler, 1979), an unfortunate effect of psychogenic theories that precipitated out of qualitative observational research is that of adding to the distress of parents of mentally disabled children, by falsely suggesting to the parents that their defective caregiving gave rise to their children’s disability (Rimland, 1964).

This paper advances the view that qualitative observation and quantitative methods in research on occupational stress help investigators push toward a common goal, namely, understanding, and doing something about,

the stressors affecting workers. The history of scientific research teaches that uncontrolled, observational inquiry has contributed significantly to theories of the etiology of physical and mental disorder. Teachers' and participant-observers' descriptions of day-to-day work activities have contributed to theories of teacher stress (Jackson, 1968; Kohl, 1976).

It is, however, important to emphasize the limits of both qualitative observational and quantitative research. Qualitative research should not substitute for appropriate quantitative methods of verification; qualitative research is ill suited for hypothesis testing. Consider the damage done by qualitative researchers (e.g., Bettelheim, 1967) who, on the basis of uncontrolled, clinical-observational evidence, wrongly attributed autism to deviant parental behavior (see Pollak, 1997) or mistakenly attributed schizophrenia to "the severe warp and early rejection" of important figures such as the so-called "schizophrenogenic mother" (Fromm-Reichmann, 1948). Qualitative research can be helpful in contexts of discovery; quantitative research is more applicable to understanding measurable differences in discrete phenomena than to "thick descriptions" (Geertz, 1973) of workers in stress-producing settings. At the same time, we stress that it would be unfortunate to write off quantitative methods as a source of theoretical insight. Quantitative methods also play an important role in the context of discovery. For example, Trow (1957) pointed out that Durkheim's (1897/1951) crude quantitative data, data that were far removed from the experiential context, added "much to our understanding of some of the most subtle and complex aspects of social life" (p. 35).

The four themes that emerged from the examination of the qualitative data which the teacher studies produced were incorporated into research questions relevant to the analyses of the quantitative data generated by the longitudinal study (Schonfeld, 2001). Both the contexts of discovery and verification are essential to the research process (Reichenbach, 1951). We advance the view that in occupational-stress research qualitative methods can be helpful in the context of discovery because such methods can contribute to (a) theory development, (b) hypothesis generation, (c) the identification of heretofore unidentified stressors and coping responses, and (d) a rich description of stressful transactions that humanize what quantitatively oriented researchers endeavor to study.

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NOTES

1. A Gates class comprises students who were held back because of poor achievement.
2. The excerpts from Emily Sachar's book *Shut up and let the lady teach: A teacher's year in a public school* were quoted by permission of the publisher.
3. Berkson's fallacy, a principle from the highly quantitative field of epidemiology, indicates that if all potential research subjects are *not* equally likely to be accepted into a study sample, investigators will have difficulty concluding that an association, found in the sample, between a factor and a disorder applies to the population (Fleiss, 1981). The fallacy explains why it is often difficult to draw firm conclusions when studying factors associated with a disorder in clinical samples. Factors that propel potential research subjects into a clinical setting, where they may be recruited for a study, often differ from factors that increase individuals' risk for a disorder. Studies of clinical samples may result in the investigator misidentifying factors that are associated with subjects' arrival at a clinical setting as factors that increase subjects' risk for a disorder. In the era of the Great Depression, it is likely that families that took their autistic children to see Kanner were mostly patrician in background. Their background wealth could explain why the families could afford to visit Kanner (1943) at his Baltimore practice—many families traveled considerable distances—and may partly account for the coolness he observed in the parents of the affected children (cf. Wing, 1985).