

Psychosocial factors in research on work conditions and health in Sweden

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Psychosocial factors could be defined as social conditions influencing individual psychological factors and vice versa. Another way of defining psychosocial factors is to say that they represent the interplay between social (environmental) and psychological (individual) factors. This interplay is the core of psychosocial research.

The psychosocial concept has been criticized for being too vague and too extensive. In practice, however, psychosocial researchers in the field of work conditions have defined certain subjects as their working area. This is a broad spectrum of subjects relevant to work organization in relation to health, for example, workhours (including shift work, which is a good example since shift work must be organized by a group and many individuals are affected both psychologically and socially by the resulting conditions), work organization, leadership in organizations, as well as questions related to work democracy and work demands. An umbrella name is psychosocial occupational health research.

How Swedish psychosocial occupational health research arose

Compared with the situation in most other countries, psychosocial occupational health research has had a strong position in Sweden. Two factors may have been of particular importance in this respect. First of all, the importance of democracy at work has been emphasized for a long time in our country. One of the roots of this democratic orientation has been the labor movement with its strong position since the beginning of the 20th century in Sweden. The labor movement has had long-lasting support from the social democratic governments that have ruled Sweden for several decades. The emphasis on democracy has, in turn, triggered an interest in how participation in decision making can influence employee health. Secondly, biological stress research started early in Sweden, partly due to the fact that biomedical research in general had a strong position in Sweden after World War II—which our country did not participate in. A Swedish Nobel Prize (for Ulf von

Euler) was important to work stress research. Euler got his prize for the discovery of noradrenaline, which is the transmitter substance of the sympathetic nervous system. This event was the basis for a vital stress research tradition that was founded during the 1950s and was very soon applied to worklife. In several ways the societal interest in work democracy and biological stress research were tied together because successful researchers were engaged and collaborated in these fields.

The Council of Personnel Administration [Personaladministrativa Rådet (PA-rådet)], a group of psychologist counselors, started as a unit emphasizing, among other things, instruments for identifying psychological individual suitability for jobs (1). However, the leading researchers there became actively interested in exploring group psychological processes at work and believed that there could be a different phenomenon for scientific inquiry than that for individual processes. The group has had great long-term importance to the academic research into and teaching of psychosocial factors at work. The Council also interacted intensively as a consulting body with physicians in charge of health issues related to the work environment in labor market negotiations, for instance, the National Board of Occupational Health and Safety, the Confederation of Employers, and the Trade Union Confederation.

Bertil Gardell was the psychologist in this group who had the most widespread international reputation. He and his co-workers were convinced that worker participation was of central importance to the work environment. Extensive epidemiologic studies confirmed the hypothesis that worker participation was also important to employee health. Gardell's basic reasoning was founded in the alienation concept—that industrialization alienates the worker from the work process. This alienation, in turn, has a negative impact on the relationship between the worker and the employer, as well as on employee health. Logically this situation would lead to increased needs for worker participation in decisions. But, first of all, there was a need for more basic research supporting or refuting such arguments. This research included evaluations of the effects of psychosocial job interventions during the latter part of Gardell's career, the 1980s (2, 3).

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Examples of branches that were studied in this manner were mail distribution and car production (4). His overall aim was really to examine whether there were any scientific arguments for increased worker participation. He also initiated collaboration with biological stress researchers, above all, Marianne Frankenhaeuser and her group. That collaboration has had great importance with respect to psychosocial work environment research. The alienation research findings appealed not only to the general working population and mass media, but also to some of the important industrial leaders of the time, for instance, Volvo's chief executive officer.

During the 1980s a close link was created between the University of Stockholm and the Swedish National Institute of Occupational Health (NIOH) [later the National Institute for Working Life (NIWL)]. Some of the most influential researchers with links to the previous Council for Personnel Administration had affiliations both to the university and to the National Institute.

At the University of Stockholm, Marianne Frankenhaeuser was the researcher who brought biological stress research into frontier psychological research, and a close collaboration was established with the work environment researchers there. It was shown that the urinary excretion of catecholamines was significantly associated with exposure to different kinds of work stressors. This was particularly clear when the increase in excretion during workhours was compared with the excretion of catecholamines during the same hours during work-free days. It was possible to follow processes, for instance, in relation to changes in workhours, by means of repeated observations. This work made it possible to verify or falsify hypotheses regarding different kinds of stressors, and it stimulated many researchers to do real-life explorations of the effects of work organization changes (5).

Lennart Levi started his stress research program at the same time as Marianne Frankenhaeuser. He is a physician and has had experience in rehabilitation, internal medicine, and psychiatry. Levi started the Clinical Stress Research Laboratory, in which urinary catecholamine excretion was an important outcome variable. Levi had a more medical profile in his research than the aforementioned psychologists. His group studied several other biological stress markers, such as thyroid hormones, electrolyte balance, and white blood cell counts. As the other Swedish stress researchers, this group has been interested in and oriented towards society. For Levi, good research is characterized as being useful and needed in society, but it is also performed in such a way that basic research can be part of it. Biological stress reactions were described in studies of shift work, assembly-line work, starvation, and cold temperatures, for instance (6). Unemployment—using a broad approach—was studied according to these principles (7). He has always recommended evaluations of interventions in his research.

Another input to psychosocial occupational health research during this time was the results from studies of critical life changes that had been introduced by the American psychiatrists Holmes and Rahe in 1968. This field was popular in psychosomatic medicine during the late 1960s and early 1970s. In Sweden, Richard Rahe spent 2 years as a guest researcher, and he initiated life event research in Sweden. Theorell and his co-workers performed one of the first epidemiologic prospective studies on the relationship between critical life changes and the risk of subsequent myocardial infarction. This study was done with male middle-aged construction workers, and it showed that critical life changes at work (eg, increased responsibility or conflicts) during 1 year had a statistically significant predictive value in relation to the risk of myocardial infarction during the subsequent 2-year period (8). This was a stimulus to psychosocial occupational health research during the 1980s.

In 1980, Lennart Levi founded the National Institute for Psychosocial Factors and Health [Institutet för Psykosocial Medicin (IPM)], which has since been a state agency under the Ministry for Health and Social Welfare. During the 1980s and 1990s, two areas of psychosocial occupational health research were focused on, namely, work organization and shift work or night work. Åkerstedt and his co-workers initially focused on night (shift) work and developed unique methods for recording fatigue and sleep during and after work-hours, as well as in a sleep laboratory. This research has stimulated a large number of basic science studies on psychobiological sleep and fatigue correlates, as well as field studies including evaluations of improvements in shift cycles (9).

The National Institute of Occupational Health started more actively and permanently to incorporate psychosocial occupational health research into work environment research during the 1980s. A wide range of research areas has been established, for instance, qualitative research questions exploring the possibilities and limitations of quantitative approaches in evaluations of interventions (10), and not only research on the relationship between psychosocial work conditions and sick leave, but also between psychosocial work conditions and work presenteeism (presence at work despite illness), which has been a neglected research area (11).

Work psychology research at the Department of Psychology in the University of Stockholm became very psychosocially oriented during the 1970s and 1980s and has continued to be so (12). Ulf Lundberg, who collaborated with Marianne Frankenhaeuser for many years, has also expanded the psychosocial work research field. His group has introduced several psychophysiological assessments, such as saliva cortisol and electromyography in psychological work stress research (13, 14). A

parallel development has taken place at the University of Göteborg, where psychosocial occupational health research spread both to the Department of Psychology at the University (15) and to the Lindholmen Institute, a research institute that specializes on muscle ergonomics but has also included psychosocial factors in its model building (16). Physiological measures of stress became an important integrated part of this work. It soon became clear that biological observations made it easier to convince the surrounding society of the importance of psychosocial factors. Thus the typical studies in this area combined biological and psychosocial assessments.

For a long time, the departments of occupational medicine hesitated to incorporate the psychosocial factors into occupational medicine. During the 1980s, however, Christer Hogstedt and his co-workers started actively to incorporate psychosocial factors at the Department of Occupational Medicine in the Karolinska Hospital in Stockholm. Fairly soon, all of the departments of occupational medicine in the country had employed experts in psychosocial factors. This action was paralleled by rapid international development. Psychosocial factors have become a major subject in occupational medicine since the 1990s. Clinically relevant research on cardiovascular disease, exhaustion syndromes, and musculoskeletal disorders is necessary for correct assessments in work compensation cases and in preventive work. Hogstedt, who was also the Professor of Occupational Medicine at the National Institute of Occupational Health, had great importance because his group started several large epidemiologic studies with a broad approach, including etiologic research on psychosocial, ergonomic, and physical and chemical exposures in relation to cardiovascular and musculoskeletal disorders. Similar developments occurred soon thereafter in Göteborg (17), Lund, Malmö (18), Linköping (19), Örebro (20), Umeå (21), and Uppsala (22, 23). Today, all of the Swedish university departments have regional large-scale cohort studies that include psychosocial work conditions. This is a valuable supplement to the national studies in a field that has been very important both to Sweden and to the other Nordic countries. The Institute for Social Research at the University of Stockholm and Statistics Sweden have been hosts of the national studies.

Epidemiologic research was developing earlier and more intensively in Göteborg than in other Swedish university cities, since Göteborg was the city where the first population-based studies of cardiovascular disease and its risk factors started in Sweden. However, epidemiologic research in psychosocial occupational health was greatly stimulated in Stockholm during the 1990s when several studies were started, such as the Stockholm heart epidemiologic program (SHEEP) and the work, lipids and fibrinogen study (WOLF) (both of

which were studies on cardiovascular disease) and the musculoskeletal intervention center studies in Norrtälje (MUSIC). Several scientific publications and extensive information to lay people about cardiovascular and musculoskeletal conditions were published from these studies (24–26)

Theoretical models particularly important to the Swedish situation

During the 1960s and 1970s the dominating model for work stress research was the one introduced by the Michigan school with its leaders Robert Kahn and James House. They had identified some psychosocial “stressors”, such as overload, role ambiguity, lack of social support, and misfit between the person and the environment (27, 28). The latter factor corresponded to the dimension “person–environment fit” (PE fit), which has had great importance in both theoretical and practical work in this area. A very different school that gained influence during these years was “critical psychology”, which had been introduced in East Germany by the two psychology professors, Hacker (1978) and Volpert (1974). They emphasized the importance of objectively recorded psychosocial conditions and introduced techniques for the systematic observation of such conditions. Such techniques have been further developed in Sweden by researchers at several institutions. The critical psychology tradition in East Germany also emphasized the importance of regarding employees as active participants rather than as passive objects.

Marianne Frankenhaeuser (1980) and her co-workers developed a theory that focused on the individual's psychophysiological reaction to stressors as the outcome variable. According to this theory, two dimensions could be identified, one that had to do with the amount of arousal that the stressor incurred and one that corresponded to negative and positive feelings. These were combined in a two-dimensional model. When the arousal level was high, two conditions could arise. One was labeled eustress (“positive stress”) and the other as distress (“negative stress”). In laboratory experiments, eustress correlated with an elevated secretion of catecholamines only, whereas distress was associated with a joint increase in both cortisol and catecholamine excretion.

Bertil Gardell and his co-workers developed theories regarding the importance of alienating work and stimulating work. Lennart Levi and his co-workers, on the other hand, emphasized the importance of the integration of a whole web of social and psychological etiologic factors and were, at this stage, more involved in epidemiologic research than the university group was.

At this stage, the demand–control model was introduced. Karasek started as an architect. He came to

Sweden in the early 1970s and was impressed by the Swedish society's social emphasis. His experiences influenced him to start a new career as a sociologist. His background as an architect was important since he could illustrate his ideas in three-dimensional drawings. He also represented the rapidly growing field of social epidemiology, which, at this time, was represented in our country mainly by the Institute for Social Research at the University of Stockholm, which Karasek collaborated with in the late 1970s. Karasek combined general stress theory (the general adaptation syndrome according to Selye) with the alienation theory, which, in our country, had been introduced by Gardell. This work resulted in the theory that high external psychological demands result in stress reactions that are dangerous to health only when the employees have little influence over their situation (low decision latitude). This theory is intended to be a stressor model in the sense that the dimensions are related to work organization and could be changed by means of work design and redesign. The model does not intend to explain interactions between individual characteristics and the environment. Karasek and Theorell (who had a background in internal medicine and physiological stress research) jointly developed "translations" of the demand-control model into a psychophysiological theory. This work stimulated several empirical studies on endocrine, immunologic, and cardiovascular reactions to variations in demands and decision latitude at work. It also stimulated national and international research on the demand-control model in relation to cardiovascular, musculoskeletal, and mental disorders. During the 1980s, the American sociologists Jeffrey Johnson and Ellen Hall stimulated researchers to expand the demand-control model to include social support at work. The demand-control support model has been widely utilized in the Nordic countries, both in research and in practical work, particularly as an educational model in intervention work in the 1980s and 1990s (29).

During the late 1990s an alternative model was introduced by the German sociologist Johannes Siegrist—the effort-reward model. This model (30), which is theoretically in a position between the psychological Frankenhaeuser "reaction" model and the demand-control "stressor" model, rapidly gained importance in our country from the early 1990s on. The theory builds upon the hypothesis that great effort has to be balanced by great reward—reciprocity. The model includes both extrinsic "stressor" and intrinsic "response" components. The intrinsic component has been labeled overcommitment. According to this theory, people with particular previous (at work and outside work) experiences and individual characteristics are overcommitted and run a greater risk than others of developing poor health when they are subjected to a high external stressor level. In the model, rewards could be material, psychological, or

sociological. During later years, the effort-reward model has been utilized in numerous studies in our country, as well as in other countries.

The two dominating psychosocial work-stress models may seem to be alike, but, in fact, epidemiologic research in which both models have been used concomitantly show that they supplement each other. It is evident that such broad general models have, however, to be supplemented with more-detailed explorations of the particular conditions at a given worksite and also that they have to be adapted to a constantly changing worklife (31). This circumstance was particularly true in Sweden during the period after the early 1990s when many changes occurred in Swedish worklife.

Gender has been an important topic in Swedish research in psychosocial occupational health, not the least since female participation in the workforce has been among the highest in the world in our country for at least 30 years. Marianne Frankenhaeuser has been an important promoter in this field. Her position was manifested in the publication of an international conference that took place in Stockholm and which summarized gender-specific stress research at the time (32). Psychosocial stressor patterns for female cardiovascular risk have been studied extensively by Kristina Orth-Gomér and her co-workers. The general conclusion has been that family conflicts are more important in such risk patterns for women than they are for men (33).

An important debate in Swedish psychosocial occupational health research has concerned scientific methods. This discussion has initiated a pluralistic approach that means that both qualitative and quantitative methods are being used. Qualitative approaches may be of particular importance during periods of dramatic change since quantitative methods may not be sensitive enough during such periods, and qualitative research may provide a good basis for redesigning large-scale questionnaire-based epidemiologic explorations. Examinations of biological stress markers have been used extensively, not only in research, but also, for instance, in practical evaluations of the health effects of psychosocial interventions.

In many ways Sweden has been a good country for psychosocial occupational health research. There has been a relatively high level of willingness to collaborate with researchers, both among employers and among employees. The population has a high level of education and is accustomed to population studies. This situation has resulted in high participation rates in work environment studies. Contrary to the situation in some other countries, Swedish employees have also hitherto accepted examinations using biological stress markers. There has been a long tradition of biological stress research in our country that may have contributed to the credibility of the field. In international evaluations of

Swedish occupational health research, there has been criticism because there is insufficient emphasis on the evaluation of interventions.

Swedish researchers in the field of psychosocial occupational health have had a relatively friendly climate during the period since the 1970s. There have been no big academic fights, and there are many examples of research endeavors that were undertaken in collaborative national and international (34) networks, as well as interdisciplinary ones (35). There has also been interdisciplinary work across national borders, such as that between southern Sweden and Denmark (14) and that between Finland, Sweden, Germany, and Great Britain in cardiovascular psychosocial occupational epidemiology (36).

An important factor in the high activity in this field during the past few decades has been the stability that was created through permanent government support to the National Institute for Working Life and the National Institute for Psychosocial Factors and Health. This support has created stability and good possibilities to develop methodologies and networks of scientists.

Since Sweden went through a financial crisis during the early 1990s, unemployment increased dramatically during this period. At the same time, resources for rehabilitation and prevention decreased. This combination was unfortunate, and there has been a related rapid increase in work-related mental ill health during the late 1990s. Long-term sick leave increased dramatically during the later part of the 1990s, and this increase was shown to be related to structural changes (37). Despite these alarming changes, research on long-term sick leave started relatively late. However, in biological stress research, knowledge regarding long-term stress mechanisms of relevance to "burnout" has grown rapidly, and therefore research in psychosocial occupational health in Sweden is contributing to this field. Since the changes were so dramatic in our country, interest in such mechanisms is pronounced.

During the late 1990s, interest in psychosocial occupational health research rapidly increased internationally. At the same time, the financial crisis in Sweden during the 1990s contributed to a somewhat weaker position for this field nationally. Therefore, Sweden's high position in psychosocial occupational health research is threatened internationally.

Financial framework for psychosocial occupational health research

Financial support to research in psychosocial occupational health (psychosocial occupational health research) has been relatively generous if an international

perspective is used. The Research Council for Worker Protection (Arbetskyddsfonden) was founded in 1972. In the beginning, research supported by this council focused primarily on chemical and physical hazards, but psychosocial factors slowly gained ground, particularly after the new law on co-determination [Medbestämmandelagen (MBL)] was introduced in 1976. This was a debated law, and societal discussions stimulated research. Two driving forces in this respect were the extensive educational program that was started in worksites for the introduction of the law and the Centre for Work Life Research (Arbetslivscentrum) that was devoted to the study of work organizations and their functions. It was financed by the Council. The support to research and developmental work grew to approximately 300 million Swedish crowns in the mid-1990s (approximately 40 million United States dollars for a population of 8 million). For a more-detailed description see the report by Oscarsson (38).

Special characteristics of Swedish development

The ground gained in the psychosocial aspects of the work environment early in Sweden may be due to many reasons. As pointed out earlier, there may be historical reasons, such as the strong position of the labor movement and the fact that Sweden has had a long-lasting tradition in mortality statistics—not only did Sweden have the world's first census in the mid-18th century, the results were made public (39). The fact that the labor movement has been strong indicates that the Swedish society has created a basis for inquiries into the establishment, mechanisms, and consequences of citizen participation in worklife. And there was basic agreement between employers and employees that these factors were important, this situation made it politically possible to create a financial basis for work environment research. By international standards, the Swedish laws on co-determination (1976) and the work environment (1978) were very radical regulation systems at the time. They enforced the fact that workers should be able to influence their work situation. Similar laws have been instituted in the other Nordic countries.

The strong position of public health statistics over a long period in our country has facilitated the creation of high-quality population surveys on life circumstances at an earlier stage than in most other countries. In particular, the Level of Living Survey (LNU) was started by the Institute for Social Research in 1968 and the Survey of Living Conditions (ULF) was initiated in 1972 by Statistics Sweden. Later (from 1989 on) Statistics Sweden, in collaboration with the Board of Occupational Safety and Health, started to collect more-detailed

survey information regarding work conditions among the working population [Work Environment Investigation (AMU)], and this work produced fairly extensive information regarding psychosocial factors. These high-quality surveys are repeated at regular intervals. A strong feature of these registers is that they can be linked to national registers of mortality, cancer incidence, hospitalization, and several other health outcomes. This linkage has provided an important basis for psychosocial work environment research. A high participation rate in these surveys was a hallmark during the initial years. Similar developments have taken place in the other Nordic countries. Concomitant information regarding outcomes in the psychosocial work environment and health in the population was attractive for foreign researchers, who saw Sweden and other Nordic countries as important "population laboratories" that stimulated international exchange in the field of psychosocial factors. Of course this aspect has been of major benefit to the research field in Sweden. An international network has created joint ventures with researchers in the psychosocial field in the other Nordic countries, Great Britain, the United States, Canada, France, Germany, and many other countries.

During these periods, the other Nordic countries have not had institutes similar to the National Institute for Psychosocial Factors and Health, and it has proved to be unusual internationally. The activities at the Institute have been cross-disciplinary in the following two ways:

1. Biological, psychological, and social research traditions have been mixed, and this joint collaborative work has been going on for several decades in a government institute. This long-lasting cross-disciplinarity has, in itself, been of importance, not only to the Institute itself, but also to other national institutions.
2. Borders between work and nonwork activities have been of less importance than in many other institutions. This situation allowed researchers to carry knowledge between work and nonwork activities in a fruitful way.

The National Institute for Psychosocial Factors and Health has been a small institute, and it has depended heavily on collaboration with the National Institute for Working Life, the National Institute of Public Health, the National Board for Health and Social Welfare, and many academic institutions. But the mere existence of a government "stress institute" with public health aspirations has stimulated other institutions to be attentive to these concerns.

While the Swedish society and its emphasis on public health and worker participation created a general basis for this kind of research, the theories and the underlying research techniques were often taken from other countries. As pointed out previously, the early years (1960s and 1970s) were characterized by group

psychology theories with influence, for instance, from the Tavistock Institute in London. And the early theories formulated for Swedish research came from the Michigan school, the person-environment fit model (25) and the social support dimension (26), as well as from stress biology research founded by Selye. Other theories that gained ground during the 1980s were founded in East German "critical psychology" theory that emphasized the individual's right and the possibility to be in command of his or her situation at work (40, 41), which was in accordance with the Swedish societal discourse at the time.

The "Swedish model" for societal discourse has changed over the years. In the beginning, the central federations of the trade unions and employers used to have representation on the boards of many government agencies. However, during the early 1990s, the Federation of Employers decided that the organization did not want to participate in these boards with activities in the work environment field [eg, the National Institute for Psychosocial Factors and Health and the National Institute for Working Life].

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