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**PREVENTION AT WORK AND STRESS EVALUATION
IN FRANCE AND IN ITALY**

**LA PRÉVENTION SUR LES LIEUX DE TRAVAIL
ET L'ÉVALUATION DU STRESS EN FRANCE ET EN ITALIE**

**PREVENZIONE NEI LUOGHI DI LAVORO E VALUTAZIONE
DELLO STRESS IN FRANCIA E IN ITALIA**

**COLLECTED PAPERS OF THE INTERDISCIPLINARY RESEARCH PROGRAM
ORGANIZATION AND WELL-BEING
EDITED BY BRUNO MAGGI AND GIOVANNI RULLI**

Abstract

A European directive, transposed into the legal systems of the member States, steers towards an idea of prevention that is primary, general, programmed and integrated in work design. The interpretation of norms and the guidelines of institutions devoted to health and safety in the workplace direct, however, towards the management of existing risks. This is particularly evident as far as stress and the so called psycho-social risks are concerned. Even the approaches of disciplines regarding work follow the same trend. A real and effective protection of well-being appears to be neglected, and this is confirmed by statistics about physical and psychological damages to workers. The contributions in this collection concern France and Italy, where, however, internationally recognized approaches, allowing primary prevention interventions on work, have been developed.

Keywords

Prevention, Stress, Risks at work, Workers' health, Organizational action

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Introduction

Bruno Maggi, Università di Bologna e Università di Ferrara

Michela Marchiori, Università di Roma Tre

Giovanni Rulli, ASL di Varese, Direzione Generale

Programma Interdisciplinare di Ricerca Organization and Well-being

The *Interdisciplinary Research Program Organization and Well-being* for many years has maintained a relationship of scientific collaboration with universities, research centers and institutions from various countries regarding the issues of well-being for people at work. This Collection of Papers is dedicated to a reflection on the approaches to prevention in the workplace and in particular to the stress and the so called “psycho-social risks” in France and Italy.

The general principles of prevention are mandated in Europe through a 1989 directive, a “framework directive” regarding health and security in the work place. These principles, as well as the definition of prevention enunciated by the EU community directive, are aimed at a *primary* - meaning that risks should be avoided before they manifest themselves - *and general prevention, programmed and incorporated into work design*. The directive has been integrated into the legal systems of the EU member states and in particular in France with a 1991 law (which changed the Work Code), and in Italy with the 1994 legislative decree.

In France these prevention principles remain unchanged in legislation and in the guidelines of the national institute for prevention of risks and workplace illnesses (INRS), but a restrictive interpretation prevails. Primary prevention is often seen as “utopian”, and a different trend emerged, focused on “risk management”, that is to say the management of behavior, with a prevailing focus workers' responsibility. This orientation appears in the same national institution, and it is sometimes present also in the related disciplinary publications, disciplines like ergonomics, work sociology and work psychology.

In Italy a new decree was published in 2008 with the goal of regrouping and re-ordering all the previous norms regarding health in workplaces, therefore substituting the 1994 decree. Prevention is conceived as only a secondary type of prevention – a prevention attempting to deal with “existing risks” present in the work place – and the evaluation of risks is largely entrusted to self certification processes done by the employers themselves. The guidelines set forth by the national institution responsible for the prevention and safety of work (ISPELS - merged in 2010 with the institution that insures workplace accidents, INAIL) have always been aimed at the management of existing risks. A large part of the various work disciplines orientation - from the fields of law and medicine to the psychological and sociological fields - seem more geared towards adapting workers to pre-determined work situations rather than pursuing the workers' well-being.

This general trend, a deviation of prevention towards risk management, and from intervention at the source of risk in the design of work to the assistance for those at risk, is particularly evident within the policies concerning the “psycho-social risks” in France and Italy. This category includes violence, mobbing, suffering and in particular stress. The proposal of this residual category of risks (shared by the various disciplines, institutions and laws) is nothing more than the result of an inability to interpret the connections between the workplace conditions and the consequences they have on the health of the workers, which cannot be understood in terms of a simple cause/effect relationship, necessary or probable, typical of the traditional interpretation of physical or chemical damages. Furthermore, the proposal of various risk categories - physical, chemical, psycho-social (the latter are ill-defined as residual, or even as “new risks” or “emerging”), signifies a singular deviation from common sense, where every type of risk in a work situation has to come from choices regarding its planning and structuration.

In order to pursue and realize effective prevention, a “healing of work” is needed, as said by Luigi Devoto in 1902, in the founding document of occupational medicine as an autonomous specialized discipline. Following the

policies of “psycho-social risks” one tries to heal the workers, or, more simply, to help them facing a situation that one does not know – or want – how to correct. Stress is probably the most obvious case of this trend.

Stress is generally defined as “an imbalance between the perception a person has of the constraints imposed upon him/her by the environment and the perception that he/she has of the resources available to him/her to face them”. This definition is found in the guidelines of the INRS in France as well as in the ISPELS in Italy, and in the reports of the commissions nominated to review this subject in the two countries as well. Guidelines and reports refer to the European Agreement on work-related stress in 2004. The common source for all these documents comes from the proposal by Richard Lazarus, who interprets stress as “a relation between the individual and the environment, evaluated by the individual as an interaction that test or goes beyond his/her resources”. The recommended approach is the “psychosocial risk-management” according to standards suggested by the Health and Safety Executive, an Institution of the United Kingdom for the health and security in the workplace.

It is surprising that all the guidelines speaking of a “vast scientific production” have the same and only reference to a psychological definition of stress deriving from a “cognitive evaluation” of the involved subject, which, by consequence, implies the “management of risk” upon the subject himself. Medicine, in particular the occupational medicine, has abdicated its role, ignoring the founding research of Hans Selye on stress. According to Selye stress is a complex and a-specific neuro-endocrinal activation. Therefore, this requires a non positivist interpretation of its sources and its possible consequences (not probable and, even less, necessary) and the intervention with a goal of prevention on the workplace, not on the subjects themselves.

The results of current approaches to “risk management” is very clear: a startlingly significant number of accidents, including many deadly ones, every day and in every country, and the increasing spread of uneasiness and suffering at work, as well as cases of suicide. Faced with this picture is doesn't seem reasonable to continue the past practices or limit ourselves to simple criticisms.

This collection of papers presents critical reflections on the issue and, by comparison, the two competitive approaches to stress. At the same time it represents a reminder of orientations, active for decades in France and Italy and internationally recognized, that are suited to “heal work” through analysis and intervention that reach the goal of primary prevention.

The texts that make up this collection were written following two debates that took place in the faculty of Law at the University of Milan the 12th of February and the 12th of July in 2010 during the 38th and 39th seminars of the Interdisciplinary Research Program Organization and Well-being, both dedicated to prevention in the workplace and to the evaluation of stress in France and Italy. The following people participated in these seminars: Pascal Etienne, Bureau chief of the Direction des condition de travail et de la prévention des risques de travail at the French Ministry of Work; Yves Clot, Professor of Work Psychology and Director of CRTD, Centre de Recherche sur le Travail et le Développement to the Conservatoire National des Arts et Métiers in Paris; Giovanni Rulli, Occupational Medicine Physician of the General Management of the ASL in Varese and former Professor at the School of Occupational Medicine at the University of Milan; Angelo Salento, researcher in the field of Sociology in the Social Sciences, Politics and Territory Faculty at the University of Salento; Giovanni Costa, Professor of Occupational Medicine in the Medical and Surgical Faculty at the University of Milan; Giuseppe Mautone, researcher in the field of Labor Law in the Faculty of Law at the University of Milan. The debates at the two seminars were moderated by Bruno Maggi, Scientific Coordinator of the Organization and Well-being Program.

Prevention in the workplace in France

Pascal Etienne

Direction générale du travail, Ministère du Travail

The understanding of principles about prevention in the workplace and of their integration within a legal, social and economic system is a subject that concerns all the prevention actors: employers, workers representatives, public powers, subjects intervening on work health and safety such as physicians and ergonomists.

A debate - which started some time ago - on these principles, on the explanation of their underlying logic, and on the discussion about their effectiveness (Etienne, Maggi, 2007; 2009) represents a good way to advance in the clarification of the different points of view.

First, the major political and legal principles upon which prevention in the workplace in France is founded on will be described, then some issues about their effectiveness will be discussed.

The political and legal principles at the basis of prevention on the workplace

The founding principles of prevention in the workplace are derived from the legislation at the National level, at the European level (European directives) and sometimes at the global level as well (declarations and conventions of the International Labor Organization).

The variety of needs concerning, on the one hand, the design of workplaces and equipments (which is attributed to owners and builders) and, on the other hand, the design of work and its organization (which is attributed to employers) is a crucial element of prevention in the workplace.

The needs concerning the design of workplaces and equipments

The source of obligations for owners and manufacturers is, at the same time, National (for the workplaces, the December 6th 1976 law) and European (for work equipments - machines - and the personal protective equipments -PPE). Both the inclusion of these prescriptions in the labor code, and the clear distinction between the design obligations and the utilization rules for entrepreneurs, employers, probably represent a French peculiarity.

For buildings and workplaces the law states, indeed, that "the owner who builds or equips buildings for work activities have to comply to the laws that regulate the protection of workers' health and safety" (art. L. 4211-1 of the Labor Code). Instructions follow concerning the integrated prevention aspects for the construction of establishments.

As far as machines and personal protective equipments are concerned, European directives (transposed in France into the Labor Code) define the prevention principles that machines or PPE manufacturers have to comply to. The rules about the placing on the market, the health and safety requirements that equipments have to comply to, as well as the technical specifications that interpret those needs, are defined in harmonized European standards (Habasque, Etienne, 2007). It should be noted, for example, that the machines design procedure included in Annex 1 of the Machines Directive (2006/42/CE) is similar to the ergonomic approach (De la Garza, Fadier, 2004), as it incorporates the risk evaluation principles related to the actual usage of the machines (with a special consideration of the foreseeable misuse as well as the utilization of the feedbacks from users).

Thus, the point 1.1.2 of the "Machines" Directive – developed in the norm EN ISO 12100-1:2003 + A1:2009, *Machines Safety*, - shows the approach to be adopted for the determination of measurements for the treatment of risks that have been identified and evaluated.

Three sequential steps are identified, according to a priority order which is often called "three steps method":

- Intrinsic prevention measures

- Technical protection measures
- Information for the users

Such a priority order must be applied in the selection of measures for the treatment of a certain risk in order to satisfy the correspondent essential health and safety needs. The application of the three steps method must also take into account the current state of technique.

These directives are articulated with the “social” directives, mostly the “framework” Directive about health and safety.

The framework directive on health and safety (89/391 / EEC)

This directive is at the center of the rules to be applied in the workplace. The directive defines, in the articles n° 3 and n°6, the prevention principles, by emphasizing primary prevention – which follows from the removal of risk through the design of establishments, equipments and work itself, and with reference to the ergonomic principles – the “adaptation of work to man” – to the usage of personal protective equipments (Etienne, Maggi, 2007).

The directive also recalls the *political and scientific principle of workers' and workers' representatives judgment* about issues of health and work safety (art. 11). Consultation with workers and their representatives, which is indicated by several articles of the directive concerning workers' participation, their education and training, is a second, important point of such directive. In France, measures for its transposition have been adopted, in particular with the strengthening of representation institutions' means and the emergence of the workers' expression right enacted in 1982 by the two “Auroux Laws”. The effectiveness of those rights responds to needs of *democracy within the enterprise*, but also to needs of *workers' health provision* related to their intervention in the work process, with the help of experts appointed by personnel representatives (Etienne, 1999).

These principles provide tangibility to the ergonomic approach, as we define it – that is, the approach based on the Ergonomic Analysis of work developed by Wisner (1995), a bottom-up approach where operators are

considered actors of their own safety, aimed at taking into consideration their knowledge for the design of work systems and equipments.

The activation of *multi-disciplinary dedicated prevention services* (art. 7) is one of the directives' points about which in France a rich and complex debate developed for over twenty years, if one considers the peculiar position of work physicians within the prevention services. The structures and practices of these services are the outcome of a long social history (which dates back to World War II). Their further evolution represents what is at stake in the debate about their direction - by employers in majority terms or with an auditing right by the unions -, about the possible maintenance of the dominant role of physicians on the policy of workplace prevention, and, more precisely, about their role: as "sentinels" of health at work or, on the contrary, as help for employers in the management of risks.

A law proposal on this issue is currently being examined by the French Parliament (in the Spring of 2011). The reform should define a multi-disciplinary, self-managed organization of work physicians, which will allow the work health services to rely on a variety of competencies (consultants for the preventions of professional risks, nurses, assistants for work health, etc.) in order to deal with the predictable insufficient number of work physicians in the coming years, and also to collectively increase the capacity of the work health service.

The ILO conventions: convention 81 on Work Inspection

Finally, the system concerning the prevention of professional risks is completed by the audit about the effectiveness of these rules in the workplace performed by a public auditing service, activated according to ILO Convention C 81 (1947). It is the inspection that verifies both the respect of needs about the actual realization of prevention principles, and the needs about workers' rights and their representatives specialized in work health and safety.

The effectiveness of principles deserves to be questioned

The effectiveness of all these principles is completely relative. In reality, the realization of this body of rules that lies at the foundation of prevention collides with the transformation of enterprises, mostly characterized by the fragmentation and globalization of production units, by the increasing precariousness of workers' status, and by new work organization forms and new management forms (especially the development of lean management), features that convey a multitude of physical and psychological constraints on workers. The economic logic of capitalism, the new forms of work contracts, and the personalization of management represent further obstacles to the realization of prevention on the workplace.

Statistics from work diseases insurances, data from surveys on work conditions, qualitative analysis carried out by ergonomists as well as the considerations by work inspectors: all these information sources attest such a state of affairs.

- *Work accidents*: the frequency trends downwards, but the gravity ratio increases, especially if one considers the majority of car accidents related to workers' mobility, which is a consequence of new managerial forms.
- The *worsening of constraints* for workers: between 1984 and 2005 all forms of rhythm constraints widely developed (DARES, 2007). For example, workers today describe their pressure to satisfy immediate requests, or their pressure in relation to colleagues, as being double to that of 20 years ago.
- The *pathologies* related to risks – defined as “psycho-social risks” – represent the consequence of new organizational and managerial forms and manifest themselves in musculo-skeletal disorders (increasing fast in the last 20 years: from 1000 recognized diseases in 1990 to 33.600 in 2008) and in serious damages to the mental health of workers (the wave of suicides concerning enterprises in France in relation to the world economic crisis of 2008).

In this perspective, if, on the one hand, it could be verified, within enterprises, a sort of “hypo-solicitation” of activities from working subjects, on the other hand many investigations (Gollac, Volkoff, 1966) ascertain even a

“hyper-solicitation”, an increasing intensification of work, which is the source of the most frequent pathologies and a significant number of work accidents.

Another remark must be made about the *insufficient consideration of prevention principles* by decision makers, and sometimes by subjects intervening on work health and safety, as they prioritize the “management of risks”, centered on individual behaviors, over primary prevention, as expressed by the hierarchy of prevention principles in the above mentioned framework directive.

Thus, for example, in *Le choix de la prevention*, the interpretation of prevention principles is completely distorted by the authors (Viet, Ruffat, 1999: 244-245). They claim that since risks can never be avoided, one must evaluate them in order to manage them. Their strategy is aimed at denying any possibility for primary prevention. They state that even the framework directive on health and safety recognizes “the relative nature of the prevention effort”, and the goal of prevention is not the removal of risk, which is considered unachievable, but the management of risk. They say that “three factors clearly show the impossibility of having zero risks”: the technical aspect (a technical system cannot be completely safe), the economic factor (safety is not free), and the human factor (“man cannot be reduced to a passive role of orders execution”).

In workplaces, even managers prioritize too much the *measurement* and the management of quantitative indicators (about stress or pollution, for example) over the actual prevention *measures* based on reflection and realization of the above mentioned principles, supported by the judgment of workers and their representatives.

The ambivalence of public policies

At the European and national level, public policies face a “conflict of logics” between the needs of the globalized market and the needs of prevention on the workplace.

At the European level, the European Commission promotes, at the same time, the “new approach” and the development of the “market surveillance”.

The Commission, in other words, promotes the auditing of products conformity to the directives' prescriptions through rules that became effective January 1st 2010 (regulation 765/2008/EC) and, at the same time, it develops a de-regulation program aimed at reducing - in the name of a "better regulation" - the legitimacy of the public intervention on workplace prevention to just the analysis of its economic impact in terms of costs/benefits for the enterprises (Vogel, Van Den Abele, 2010). In small enterprises, the attenuation of such policy would result in the suppression of the obligation to evaluate risks in the workplaces and to elaborate adequate prevention plans.

At the national level the situation appears to be conflictual. Since the end of the 90's, the public debate in France about the issues of work health and safety took shape and pushed those issues out of the specialists' field (Henry, 2008).

Along this line, the public communication campaign about musculo-skeletal disorders prevention allowed to spread a prevention message, particularly to decision-makers, pushing them to support and accelerate the processes enacted by the enterprises and to guide them towards adequate referents.

In institutional terms, a trend is emerging that concerns the limitation of personnel representation rights. The right to a judgment external to the company is questioned again, a judgment that personnel representatives utilize as a support to the workers' experience. Also, it is often proposed the cancelation of representatives specialized in work health and safety, while it is favored by some the activation of a "single personnel delegation" (Barthelemy, Cette, 2010).

Similarly, a will to elude the public audit can be observed, through management's private certifications on work health and safety, according to private (OHS 18.000) or public (ILO-OSH 2001) criteria.

However, some *developments of prevention policies* seem to be appearing. Indeed, following the asbestos scandal and the victims' lawsuits, some legal principles are emerging, such as "the obligation of the outcome safety" for the

employers and the obligation, for the public powers, to investigate the damages, to prescribe adequate prevention rules and to ensure their application.

Thus, in the field of civil law, the supreme court reminds (Cour de cassation, 2002) that the employer is bounded to an *obligation of outcome safety* as far as workers' health and safety protection are concerned.

The Council of State (a court that judge the regulation acts issued by the State) extends such public power obligation by reminding recently that "the public authorities that are responsible for the professional risks prevention must keep informed of damages that workers can suffer within their professional activity, considering in particular the products and the substances that they work with, and to establish the most appropriate measures to limit or, if possible, to eliminate such damages, according to the current state of scientific knowledge or, if necessary, through further studies and investigations (Conseil d' Etat, 2004).

In this context, the government representatives started some action plans in order to strengthen the prevention in the workplaces, such as the "Health Work Plan". These plans are aimed at motivating the public powers, the governmental agencies and the enterprises, to pursue both quantitative and qualitative goals for the development of knowledge in the field of work health and safety and of prevention effectiveness in the workplace.

The contribution of work disciplines to the reflection on prevention

Finally, the contribution of work disciplines on prevention will be discussed.

We argue that these disciplines can – among other things – offer some instruments for prevention, in the form of legal principles, ergonomic prescriptions, criteria for the work organization and the management of enterprises.

If it is true that the conditions of workers' exposure to professional risks represent an *enigma* which is accessible only in a fragmented way by the various

protagonists, workers, managers, prevention operators (Garrigou, 2004), then it is essential that ergonomists do not entrench themselves behind such a position in order to argue that the complexity of real situations does not allow the identification of useful *hic et nunc* principles for the prevention of health damages. Thus, we do not agree with the point of view expressed by some ergonomists (such as Trinquet, 1996) who oppose primary prevention and work design to the action of prevention operators in the field, or by work psychologists claiming that it is necessary to "resist against the request of a *normalization activity*" based on good practices (Clot, 2010).

Such a refusal of reference criteria and prevention principles is questionable. We think it is better to adopt a perspective of continuous improvement of the different kinds of prescriptions and enterprises' practices, rather than a perspective that refuses an adequate prescription, in the name of opposition to hygienism or in the name of work complexity and richness - which is certainly real.

For example, in the field of musculo-skeletal disorders, not to utilize the instruments provided by the standards concerning values (of strength, or repetitivity - like norm NF X 35 109, standards about the machines safety, ergonomic standards of the Technical Committee TC 122 of CEN), and also not to list the managerial or work organization good practices allowing to ensure discretion to operators and a durable prevention, it would mean to let workers "scrape along" in the face of managers' prescriptions, and to leave room to those managers who base on traditional managerial indicators, which do not consider at all the work health and safety needs.

Conclusions

In the next years the destiny of workplace prevention might depend on both the synergies between public policies, at the national and European level, about the needs of work health, public health and environment protection, and the employers' and workers' capacity to provide concrete answers to these needs and to ensure prevention from the most relevant risks, such as the

"psycho-social risks" or the musculo-skeletal disorders: in the work organization choices made by the companies' managers, in the debates about the demands by personnel representatives, in the requests by the workers themselves.

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Prevention in the workplace in Italy

Bruno Maggi

Università di Bologna e Università di Ferrara

With the goal of outlining a current approach to prevention in the workplace in Italy, we will refer to the legislative framework, the disciplinary orientations and the current practices. While commenting on the norms, the proposals of the involved disciplines and the practices that are common in the workplace, we will have to express our point of view, which will lead us to a critical evaluation. In order to keep this text concise, we will give ourselves the liberty of recalling previous writings in which we discussed in more detail various points and supported our criticism with more accuracy.

The legislative framework

Current norms “concerning the safe-guarding of health and safety in the work place” are part of the legislative decree 81/2008 which has been updated by legislative decree 106/2009. The 2008 decree was meant to re-group into one single text all previous norms regarding this subject, above all including legislative decree 626/1994 which brought the European directive 89/391 called “Framework Directive” into the national legal system (as was the case in every EU country). Since the decree 81/2008 (art. 1 par. 1) states that its “goal” is the “re-ordering and coordination” of previous national norms “in agreement with EU norms and international conventions”, the principles of prevention contained in this decree must be first of all comparable to those expressed by the European directive of 1989 and the Italian decree of 1994 that has since been abolished.

The directive 89/391 defines prevention as “all the steps or measures taken or planned at all stages of activities in the enterprise in the undertaking to

prevent or reduce occupational risk" (art. 3, d). Therefore this directive establishes (art. 6) a hierarchical order of measures to adopt: first, "avoiding risks", then "evaluating the risks that cannot be avoided", "combating risk at the source", etc. The Italian decree 626/1994 brought this set of safeguarding measures with art. 3, though with less clarity, and it put the evaluation of risk before their "avoidance" and the "combating of risks at the source" but it kept (art. 2) the definition of prevention as stated in the directive: a concept of prevention foremost as *primary*, that is aimed at avoiding risks and combating them at the root before they manifest themselves in the workplace.

Prevention as seen through this definition is also *general*, since it concerns the entire work situation. This is confirmed, directly or indirectly, by other requirements as set out by the directive and the decree 626/1994. Finally, the directive (art. 6 par. 2, g.) and the Italian decree (art. 3 par. 1, d.) require that prevention be *programmed*, meaning prevention is thought out beforehand in general terms, and *integrated into the conception* of work situations.

Instead, in the decree 81/2008, primary prevention appears to be completely removed. Prevention is still defined (art. 2, n.) as the set of measures "that avoid or reduce occupational risks", but these "general safety measures" (art. 15) begin with the evaluation of risks, and there is no trace of a requirement to avoid risks. Moreover, evaluation is limited to "present risks" by the article dedicated to definitions (art. 2, q.). The definition of prevention, compared to the European directive and the decree 626/94, adds that measures taken must be required "according to the specificity of work, the experience and the technique" - which can be interpreted in a restrictive sense -, while at the same time it cancels that all measure must be "taken or planned in each phase of the work activities" - which is the *primary* and *general* dimension of prevention. Likewise, the prevention program which integrates "the technical and productive conditions of the company"(art. 15, b.) does not correspond to the prescription of prevention that is *programmed and integrated into the conception* of work situations of abolished norms and the EU directives.

Moreover, it is possible to verify that when the decree 81/2008 talks

about risks it refers to only "present risks" or "existing risks", to "risks exposure" or "management of risks" (see also, e.g., art. 9, 18, 25, 26, 28, 32, 34, 36, 41, 44). The shift from a vision focused on primary prevention to a secondary prevention framework - one that tries to face existing risks in the work situation - is clear and definite in the current norms. It is doubtful that they "respect EU norms".

The prescription for risks evaluation contained in the European directive (art. 6 and 9) has been transposed into the legislative decree 626/1994 (art. 4) which detailed the evaluation modalities, and imposed to specify the "adopted criteria". This has been interpreted as the need to consider "objective criteria", with a particular reference to the orientations of the occupational medicine and hygiene department of the EU. This objectivity had to be in some way scientifically proved. The legislative decree 81/2008 maintains the obligation to specify the criteria for the evaluation of risks - at this point only the existing risks - (art. 28 par. 2, a.). But the legislative decree 106/2009 that brought changes in almost all norms enacted the year before, modified with its art. 18 (par. 1, d.) the art. 28 of the 2008 decree, requiring that the "choice of the criteria is left to the employer". All objectivity is lost. From this change, we can infer that each employer can make any evaluation, attesting to its validity himself.

Finally, current norms do not imply any obligation about the *analysis of work* with the goal of prevention. The path that lead to an evaluation of risks and to the planning of prevention, according to the EU directive and its integration into the national system, clearly presupposed this obligation, which could be considered the most relevant innovation of those norms. We saw that prevention was conceived as primary, general, programmed and integrated into the conception of work. It should have been based on a general and thorough evaluation, objectively founded on proven criteria, with an iterative form and focused on a constant improving of the complete work situation and all of its aspects. This presupposed an analysis and an intervention in the work situation for the checking of the health and safety of workers. In this sense one could have talked about a mandatory analysis of work introduced by the law (Maggi,

1997; 2003: II, 4). Furthermore, this was the acknowledgment of the results of innumerable studies in the fields of work psychology, work sociology and ergonomics.

The disciplinary orientations

Occupational medicine was established in Milan at the beginning of the 20th century by Luigi Devoto. Referring to work as the “real patient”, he called for a discipline with clearly preventative intentions. Although in fact divided over the course of its history between the attention to the work related illnesses and the intervention in the work place, Italian occupational medicine has always cultivated a real commitment in the work environment and to its direct understanding. A close collaboration with union representatives in factories dates to the 1970s. A considerable amount of experience in the workplace has developed among physicians in the multidisciplinary units of local Health Departments of the National Health Care System with the law n. 833 of 1978.

Despite these characteristic traits, Italian occupational medicine has not been able to acquire the capacity to listen to inputs from other fields of study, regarding the analysis of the work processes aimed to prevention, which has been well documented by some of its own representatives (Grieco, 1990; Rulli, 1996). Instead, over the course of time, it acquired indications from engineering disciplines about the procedures of industrial transformation, ideas from the Tayloristic vision of work, the union proposal on how to classify “harmful factors” and messages from functionalistic social psychology on informality, flexibility, discretion and satisfaction. It is true that it was able to give critical observations on these contributions, but it remained nonetheless exposed to contradictory influences of inadequate proposals for the goals of prevention (Maggi, 1994/2010).

Above all it remained anchored to methods of necessary or probabilistic explanations from traditional epidemiology, which infers risks from damages according to parameters of exposure, and, in this way, it does not allow an adequate explanation of conditions and consequences of risks when they are

possible, but not probable or even less necessary. The most relevant case concerns the study of stress, where occupational medicine remains incapable of interpreting the a-specific relations among *stressors*, *stress*, *strain* and the consequences on the health of involved subjects. The adoption of a psychological interpretation of stress - in reality a delegation - of the unwarranted notion of "psycho-social risks" which would add to the "physical and chemical risks", and the constant use of the idea of risk "factor" even where there isn't a cause/effect relationship, largely testify about an unresolved weakness (Maggi, 1994/2010).

Since 1981, the teaching of work analysis criteria according to the methodology of the Interdisciplinary Research Program "Organization and Well-being" has been an exception in the Graduate School of Occupational Medicine at the University of Milan. It is an exception that cannot have decisive influences on the general orientation of the discipline.

The Italian discipline of *labor law* tends to accept a vision of the work situation as necessarily predetermined by economic and managerial choices of the entrepreneur. Even the interpretation of work relationships is recently referring, sometimes explicitly, to a functionalistic theory of enterprise economics. The research contribution by Salento (see the present publication) illustrates this trend, which is shaping a real change in the traditional frame of reference of the discipline.

In reality, the freedom of economic initiative, as stated by the first paragraph of article 41 of the Constitution, is subject to - from the second paragraph of the same article in the Constitution - conditions that don't entail damage to the safety, the freedom or the dignity of human beings, and health is protected by article 32 of the Constitution as a fundamental right.

In particular, regarding prevention in the workplace, the current interpretation of the norms recognizes that the employer has to adopt the safest technological devices available, but the consequences of the choices regarding the organization about safety aren't given equal attention - and this is even present in the jurisprudence (as made clear by Guarinello, 1997). Nevertheless, a

part of the doctrine supports the obligation to respect, through the organizational choices, the fundamental good that is the workers' health (see, for example, Montuschi, 1976/1989; Lai, 2006).

The way *organization* is conceived has a fundamental impact on the attitude of both the doctrine and the jurisprudence about the problems of prevention in the workplace. Now, on the one side organization is seen as an "entity" (a set of persons, places, tools, financial resources, etc.), which prohibits the understanding of the "organizing action" shaping the work situation, including the consequences on the health of involved subjects. On the other side, this vision separates the "organization of work" from choices about the workflow, the physical conditions, the tools, the materials, the management of time and space etc. This does not allow to realize that all aspects of the work process are nothing more than the result of organizational choices that - in a variable way - shape it and constitute it (Maggi, 2003; 2008).

It should be added that labor law borrows from biomedical language terms like "risk factors", "work related stress" and "organizational harm". The first term - as we mentioned above - doesn't consider the methodological reflections regarding the differences between relationships of necessary, probable and possible causality. The second term says nothing about the specifics of stress at work and totally ignores studies about stress (Rulli, 2010). The third term ignores the reflections from the organization discipline, and absurdly presumes the existence of risks and damages, in work places, which wouldn't have their roots in organizational choices (Maggi, 2003; 2008).

Italian labor law academics appear divided over current norms on safety and health between those who propose a positive evaluation and those who have critical evaluations mostly over the legislative text's redundancy and its tendency to attempt solutions of prevention problems through procedures and certifications. The issue about the removal of primary prevention in these norms isn't raised. The judicial debate appears to ignore that the guidelines these norms refer to exclusively consider secondary prevention, and that in a majority of cases enterprises do not respect these norms or guidelines.

The *sociology of work* founded by Georges Friedmann (Friedmann, Naville, 1961-1962) aspired to represent the point of convergence of numerous disciplines for the establishment of a global “science of work”, where the “well-being” of workers would be a fundamental goal. In reality the interdisciplinary ambition and the theme of well-being were abandoned during the institutionalization of the discipline, which had considerable developments anyway (Maggi, 2003: II, 1). In Italy, instead, we had the emergence of an *economic sociology*, which includes - with unbalanced developments - studies on occupational sociology and labor markets, industrial transformations, economic processes and industrial relationships (Martinelli, 1985; Regini, 2007).

The study of work situations and their transformations, like the study of the organizational change of work, appears to be far from Friedmann's sociology and - except in some rare cases - it falls back on the socio-technical social psychology - or, sometimes, towards phenomenological orientations. In particular, the human relations orientation constitutes the preferred framework of reference of the (rare) approaches to health at work. In fact, these approaches deal with the “quality of life at work”, following old and renewed theories of “motivation”, “satisfaction”, and “flexibility”. In the functionalist logic of a work system predetermined by economic and technological choices, the “adaptation” of the subject is at stake. A flexible adaptation achieved through the reduction of “perceived” stress and through increased satisfaction, with the goal of a “satisfactory quality” of work life, passed off as a well-being solution (Maggi, 2008).

Italian *work psychology*, along with these psycho-social approaches - shared with a self-asserted sociology of work - has produced two original approaches which cannot be forgotten. The first one was born in the Center for Psychology at the Olivetti factories, founded by Cesare Musatti, father of the Italian psycho-analysis, mandated by the enlightened entrepreneur Adriano Olivetti. Within the unique environment of a company open to human values, studies in the 1960s principally led by psychologists Franco Novara and Renato Rozzi were able to influence the organizational choices of engineers (Musatti *et*

al., 1980). They demonstrated the risks and damages of Tayloristic solutions and they favored an enrichment of tasks and the teamwork with a psycho-technical approach which was heavily influenced by a psycho-dynamic foundation.

A second approach was developed by Ivar Oddone, University of Turin, with union representatives from the Fiat automobile factories in the 1960s and 70s. Based on valuing the workers' experience, in opposition to the delegation of health to technicians, which is typical of an academic psychology and occupational medicine posture (Oddone, Re, Briante, 1977), it had varying successes for its various components. The proposal of an analysis of work that had workers as the main actors was valued in France by the interpretation of Yves Clot within the framework of his approach to the "analysis of activity" (see in particular Clot, 2008: I, 4), and it was also valued by Yves Schwartz who made reference to it in his "ergologic" approach (Schwartz, 2001: *passim*). In Italy the union (in particular CGIL) and, in part, the occupational medicine, accepted an instrument for reading the work conditions: a classification of "four groups of harmful factors". However, the union and the occupational medicine quickly found themselves faced with large weaknesses implicit in this instrument: the attempt to interpret repetition, monotony, rhythms and fatigue as "factors" (presuming an explanation in terms of necessary causality); the combination of the incompatible logics such as the positivistic cause effect explanation and the interpretation of subjectivity; the separation of the "work organization" and the "environment" (as if physical "harmful factors" were not the result of organizational choices); the presumption that a Tayloristic organization is the only one possible (Maggi, 1994/2010; 2003: II, 4).

Ergonomics, highly developed around the world according to various orientations, in Italy never had a disciplinary "birth", because interest in ergonomics was pursued by occupational medicine physicians within the framework of their own discipline, just like, rarely, by psychologists (e.g. Re, 1995). Moreover, physicians were attracted by the views of anglophone ergonomics, neglecting the francophone traditions which were characterized by the study of work situations and by the interventions to transform them, more

suit to the Italian approach to occupational medicine.

The *engineering disciplines*, the *business economics* and the *management studies*, up until now seem not to have asked themselves questions about the relation between well-being and workers.

Practices and their results

“Good practices” and “guidelines” for the application of norms about health and security are mostly laid out from two national institutions: ISPELS (the institution for the prevention and the security at work) and INAIL (the national insurance institute for workplace accidents - in 2010 ISPELS has been incorporated into INAIL) as stated in the legislative decree 81/2008 and today still in practice (art. 2 par. 1 letter v. & z. and art. 9 par. 2 letter i. & l.).

The guidelines for the evaluation of risks were produced in the 1990s following the publication of the previous legislative decree 626/1994. These guidelines obviously had the intention of leading towards an exhaustive check for risks, but are exclusively aimed at secondary prevention, while totally ignoring primary prevention. Given the institutional source (and the legislative reference) of these instructions, the companies that follow them can claim to have complied to the requirements of the law. Incidentally, this fact might weaken the debate regarding the interpretation of the norms. Yet the practices of companies appear to often distance themselves from secondary prevention as well. Small and medium sized companies rely on the fact that there is a low probability of inspections. Large companies calculate that, in their view, fines cost less than compliance the norms. Both large and small companies rely on self-certification as prescribed by the law.

After a season of glorious years in the 1960s and 70s for the workers' consciousness of workplace health, the union abandoned this theme because of the defeat suffered in 1980 by FIAT's initiative. It needs to be said that the Italian union never had clear ideas about prevention. Along with the tool of “the four groups of harmful factors”, the union accepted the messages from socio-technical human relations that praised the “autonomous work groups”,

the “flexibility” and the “satisfaction”. When the demands based on the evaluation of “harmful factors” caused managerial choices that worsened the conditions of the involved workers, the union was unable to reflect on the reasons why results were contrary to expectations (that is, the foundations of the adopted tool) and it has again proposed the same tool when the legislative decree 626/1994 was emanated. Recently the union has defended the legislative decree 81/2008 only because it was proposed by a center-left government and then modified by the successive right wing government, without considering the gap between these norms and previous norms, especially the EU norms.

What are the results of these practices? Just referring to the most serious accidents, there is an average of three deaths each day. INAIL has recently expressed a positive evaluation of the reduction in official accident statistics in the recent years, an valuation that was emphasized by mass media, forgetting that the data has to be compared to data regarding employment and the working hours. In the same years, employment has sharply diminished, just like the total number of working hours, that is, the actual exposure to risks. This concerns legal work only. To that data we need to add the “undocumented” work of the unemployed, the retired and the illegal immigrants, obviously with undocumented accidents. In reality, accidents, when in relation to the actual number of people working, progressively increase.

Can we doubt that the current norms on health and safety in the workplace are suited to their goal? Can we question common practices? Shouldn't the disciplines in this field question their own approaches? Allow us to remind that the Interdisciplinary Research Program Organization and Well-being has been proposing for the last three decades a different approach to prevention and organization, and a practice of work analysis and intervention that makes primary prevention a reality.

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Work safety and the dogma of entrepreneurial monopoly on organization

Angelo Salento
Università del Salento

This contribution aims to explain, from a perspective of law culture analysis, and in relation to some concepts from the Theory of Organizational Action (Maggi 1984/1990; 2003) the difficulty to guide the production of labour norms about safety consistently with a conception of *primary prevention*.

For this goal, it is essential to emphasize that the theoretical and practical development of primary prevention – that is, the concept of prevention according to which risks should be avoided through the *ex-ante* removal of circumstances that can generate them – is based on a tight connection between the issues of work safety and organizational action – in other words, the area of work activities coordination and control. More specifically, it is necessary to consider that it is possible to utilize a concept of primary prevention if (and only if) a conception of organization as a process of actions and decisions is adopted (Maggi 1984/1990). Only if we conceive organization as a continuous regulation and adjustment of relationships and tasks, according to a basis of bounded rationality, it is possible to achieve a complete integration of the issue of well-being into the organizational dimension; in other words, to think about well-being as an intrinsic component of organized work. Instead, such possibility cannot be achieved if organization is conceived – according to a subjectivistic conception – as the unpredictable outcome of an *ex-ante* unregulated interaction of social actors. Or, even more, such possibility cannot be achieved if organization is conceived - according to a reified and objectivistic conception – as a mechanism of “income optimization”, based on the idea of absolute, economic rationality.

The issue can be made even more clear if we distinguish between safety *of work* and safety *at work* – expressions that are used in the social and juridical discourse as they had the same meaning. The first expression refers to an idea of *safe work*, that is, work inspired to well-being goals (among other goals). The second expression refers to a second-order protection, that is, the protection of workers from work activities designed and regulated towards goals of productivity, which can generate “side effects” on workers’ health.

Even if workers’ safety has always been considered as an essential good, the production of juridical norms shows an insufficient capacity to frame protection within a conception of primary prevention.

In the next pages, I will propose a short list – certainly not a complete one – of the obstacles hindering the diffusion of the primary prevention conception in labour law. However, I would like to anticipate the ideological aspect that, I believe, constitutes the background for labour law in terms of safety, which is crucial in influencing the production of laws and their interpretation. It is an ideological issue related to the neo-liberal labour law, that is, the principle by which the organization – meaning the organizational action, the organizing practice – can only be controlled by the entrepreneur, and as such cannot be influenced by the heteronomous, external intervention of the law.

As it will better explained later, this idea is mostly diffused in the neo-liberal common sense as well as in the most recent conceptions (even juridical ones) of organization and enterprise. However, it is also diffused in the liberal component of the legal system. Like it or not, it is codified at the highest level by the article 41 of the Italian Constitution. The fundamental principle stated by such article, at the first paragraph, is that the private economic initiative is free. People’s safety, freedom and dignity are conceived, in the second paragraph of the same article, as an external constraint to the free and private economic initiative. These goods, however essential within the Constitution, are conceived as an extrinsic limitation to the economic freedom, not as necessary and fundamental elements of the economic action. From this

point of view, the firm – even though harmful behavior are forbidden – is and stays *private*: it is conceived as a realm where the interference of the juridical rules, intrinsically collective and political, is not allowed.

Being the “juridical nature” of the firm conceived in such a way, the juridical system does not prescribe the adoption of any tools for primary prevention. Nothing allows a heteronomous regulation intervention in the organizational action. In principle, then, since the entrepreneur’s sovereignty cannot be limited at its “source”, safety of work cannot be assured from the moment of its design, which is crucial in terms of primary prevention.

Such a principle of freedom and, even more, of privacy of the economic action – which in the last century was questioned with partial and reversible success – is the pre-notion that leads to think about the issue of safety as the necessity to protect the workers from a set of risks rather than the necessity to completely eliminate risks from work.

A number of problems are connected to this normative (but, even more, ideological) basis, a number of dead ends about the right to work safety, which I am going to identify in a brief and purely illustrative manner.

The first aspect worth considering is the hypertrophy of the compensatory dimension of the safety juridical regulation.

Even if the article 2087 of the Italian Civil Code – which is still the fundamental norm for this matter – explicitly refers to the obligation to *act* on the part of the entrepreneur («The entrepreneur is obliged to adopt in the firm the measures that, according to the specificity of work, the experience and the techniques, are necessary to protect the physical integrity and the moral personality of workers») few have wondered and asked, to the “legal system”, what remedies can be implemented (before the compensatory protection, that is, before the damage is done) in case of violation of the safety obligation. In fact, it is worth mentioning that the compensatory protection for safety violations lies within a general framework where categories of refundable damages multiply, according of article 2043 and the following ones of Civil Code. Such a tendency treat the juridical device of civil responsibility as a

general conversion tool of *bad* into *good*, by elevating the financialization of damage as a tool for universal satisfaction. Just in the labor law, it is hard to list all the categories of refundable damage that the jurisprudence created: existential damage, mobbing damage, damage from impoverishment of tasks, damage from over-work, damage from abusive firing, damage from sexual harassment.

Paradoxically, even if article 2087 is not at all incompatible with a conception of primary prevention, only rarely the safety obligation has been given adequate foundation by the disciplinary debate – and, even more, by the jurisprudence. A radical change of direction would be necessary and even urgent. As Pasqualino Albi wrote, one of the few authors who carefully brought the attention on this issue, we should not think that compensation is the only practical tool, because such choice would not be correct from a juridical point of view, as it would be regressive from a social point of view (Albi, 2008: 8).

Besides the not so difficult technical-juridical problems (mostly related to the fact that jurists keep debating on the basis of the contract / institution dichotomy, which probably should be surpassed by other analytical tools), the foundation of this insufficient attitude lies – I believe – in the tendency to assume that the entrepreneur has the right to full, exclusive, formal control of organizational decisions, while he has to take responsibility of sanctions for damages. Such a formal control is sometimes openly asserted by the discipline (e.g., Riva Sanseverino, 1971). Other times, it is accepted as an unavoidable condition, which in practice makes it unfeasible any non-compensatory protection (e.g. Carinci, 1995).

This ideology of the juridical culture lies at the basis of another common argument by jurists about work safety: the tendency to consider the issue of safety in terms of a balance of interests, a comparison between the relevance of the life and the physical integrity of people, on one side, and the interest of the entrepreneur to generate income, on the other.

Our goal here is neither to establish which of these two “goods” found higher consideration in various cases, nor to ascertain if workers’ health has

been subordinated – in the production and interpretation of norms – to the needs of economic value production. Instead, we want to emphasize that the very idea of a more or less explicit “balance” between those two needs, that are obviously not comparable, is almost grotesque.

Nevertheless, despite the radical non-comparability of those needs, once the privacy of the economic initiative (and, thusly, of the organizational action) has been accepted, an ideological umbrella under which the economic interest and the human well-being can be perceived as comparable is generated. Even those who do not explicitly accept this comparison arrive to a similar conclusion, arguing that article 41 of the Italian Constitution «does not imply a coordination between equally valuable principles » but instead a rule that limits the private initiative in relation to values such as people’s safety, freedom and dignity (Navarretta, 1996: 66.). It is a limitation conceived and implemented as a purely external constraint to organizational choices.

Instead, if the idea according to which the prevention of work related risks is generated at the moment of its design is accepted – in other words, if we accept the idea of primary prevention, then the opposition between well-being and wealth production would lose its foundation. However, until we remain more or less implicitly chained to the liberal dogma according to which the organization is the opaque sphere of entrepreneurial sovereignty, a concept of antagonist relation between well-being and economic activity cannot be avoided, a sort of zero-sum game in which – through an absurd balance of interests that can only be solved, in practice, through dynamic power relations – it is necessary every time to give up something: either to the interest of “production” (or, more recently, the interest of shareholders and owners), or to the interest of workers in terms of safety and well-being.

A third *impasse* of the labor law doctrine in terms of safety is the problem of the so called *subjective element* of responsibility. In short, the issue is the following: to ask the entrepreneur to be responsible *anyway* of the harm caused to the workers isn’t it an arrogant imposition of an *objective* responsibility, that is, a responsibility independent from negligence and guilt?

This is, most likely, the core argument brought by the less labor-oriented components of the labor law doctrine – and, of course, by the managerial literature – in order to oppose to the more severe interpretations and applications of safety obligations and related responsibilities. Hence, the interest showed by those components of the juridical culture towards recent safety regulation techniques which refer to the so called “organizational models” (that is, standardized management protocols whose application exempts from safety responsibilities). The idea behind this interest is the possibility, for the entrepreneur, to predict the “costs of safety”: to be sure that, once the necessary investments for the certification of his compliance to a standard are made, he’s exempt from any further prevention obligation and, most of all, from unpredicted sanctions.

Even this third *vexata quaestio* of the safety debate has its roots in the reciprocal unfamiliarity of organizational action (conceived as an area of entrepreneurial sovereignty) and work safety. It would lose relevance, instead, if – once abandoned the dogma of the entrepreneurial monopoly on organization – a conception of prevention as primary prevention were widely adopted. If the production of prevention was immanent to the organizational action – instead of being conceived as an external constraint, as a deterrent with indirect effectiveness – the issue would lose its foundation.

It should also be added that – if non compensatory remedies were utilized for the violations of safety obligations (the issue has been discussed above) – surely a need underlying the most severe interpretations of employers’ responsibility would cease to exist, that is, the need to predetermine a general deterrent towards those who exercise entrepreneurial activities.

Overall, the issue of primary prevention – in its comparison with the inspiring logic of juridical discourses and norms – leads to the heart of 20th century debate: the questioning of the entrepreneurial sovereignty on organization. The taboo of entrepreneurial sovereignty on the design, coordination and control of production activities has never been completely removed. In the second half of last century, in Italy, it was temporarily

abandoned with great effort. As far as the general labour and industrial relations norms are concerned, the Workers' Statute for the first time generated an interference of heteronomous norms into the sphere of entrepreneurs' ownership. In terms of safety, a few milestones were set by the Decree 626 of 1994 (on this, please see, extensively, Maggi, 1996)

Quite different is the tone of the Decree 81 of 2008, with a further reduction in the intensity of prevention by the Decree 106 of 2009. These more recent norms represent, in terms of prevention, a relevant step back. Primary prevention is not even mentioned, and the objective and subjective field of application of the norms is very confused. This is the realization of a neo-liberal logic which, however, here tries to integrate itself (in an unconvincing way) with the progressive rhetoric of safety.

Besides the façade solidarity and the emphasis on rhetoric safety by the media, nowadays the regulation of work safety is in contrast with a renewed centrality of the private (and financial) conception of the firm – that is, a generalized tendency to think about the firm not as a device for the rationalization of production (with all the implications for the relevance of the interests of workers and, in general, of the so-called stakeholders), but as a merely contractual device for the increase of the invested capital (Krippner, 2005; Gallino, 2005). From this perspective, it becomes even more difficult to pursue the possibility to protect the interest of workers through an “internal” limitation of ownership’s power.

At least for what concerns the sensitivity to the work environment, the general frame of reference about the diffusion of post-material values in (already) industrialized contexts (Inglehart, 1989) most likely requires to be questioned again, for several reasons. First, because within a crisis scenario, unemployment and deindustrialization increase in western economies; second, because for a long time there has been a process of externalization of the perception of risk from the factory to the environment (Beck, 1986); third, and mostly, because the enterprise as well as the capitalistic transformation of work

into economic value – both protected by the strong neo-liberal symbolic universe – have never been so resilient to any attempt to redefine their rules.

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Hygienism against work quality?

Yves Clot

Chaire de Psychologie du travail du Conservatoire National des Arts et Métiers, Paris

The management of the so-called “psycho-social risks” has become a real business including stress, suffering and violence at work, moral harassments and sometimes even musculoskeletal disorders. It is not certain that the necessary changes in work benefit from this.

Real work

In order to introduce the subject, let us borrow an example of work analysis from a French ergonomist. J. Duraffourg talks about his intervention on a work situation in which he analyzed the activity of metallurgic workers within a large French multinational company. These workers complained about a risky situation which, however, the employer blamed on them. They expose themselves, against their work prescriptions, to the radiant heat of ovens producing calcium carbide with temperatures over 200°. The risks for their health are evident. The management does not permit this kind workers' activity, because the company invested in machines that allow to clean up the ovens from a distance. Workers, according to the management, do not have to stay “at the mouth of the ovens”. The cleaning machines are utilized and work well. However, workers keep on operating the ovens manually at the end of the casting flow. Duraffourg notices that from this fact one could easily infer that workers resist to change, that they are not able to adapt – in short, that they “prefer this way!”(Duraffourg, 2004: 87).

But, in his conclusions, the ergonomist's analysis sheds light on a new fact: the consequences on work of the problems related to the quality of raw materials, which create an improper functioning of ovens. These are fed with oil

coke, which is cheap but creates a “worse casting flow”, according to the expression of workers, when compared to the metallurgic coke. The low quality of lime increases the casting flow time and the number of interventions necessary to clean more often the ovens. Also, the simultaneous presence of lime granules and coke granules creates disturbances to the functioning of ovens, and increases the risk of explosions. In short, the oven does not function well, the “casting flow goes wrong” and, most of all, metallurgic workers say that “bad metal bars are produced”. For these workers, right or wrong, this is unbearable. And, in order to “cast properly”, they stand at the “mouth of the oven” with iron sticks to empty it nicely, to clean it from impurities, to distribute the carbide in the bar mold. In short, they try to do their job, notwithstanding the low quality coke that makes the ovens dirty and their exposition to the radiant heat.

The factory manager does not want to hear anything about the ergonomic diagnosis and the effects of the kind of coke used in the workers’ activity. This is because the decision of using bad quality coke in the ovens does not concern him, it is something that goes beyond his level of action. For him, only the behavior of workers is the object of discussion. That behavior is the one that has to be changed in order to preserve their “well-being”.

Health and health

This example is a prototype of the issues that we intend to discuss. It shows the complexity of problems related to health at work, not just in factories. One could even think that such complexity increases when the issue concerns service activities rather than manufacturing ones. This is because, indeed, the criteria of a “job well done” become more complicated when the object of work is the activity of subjects, customers or users, and not just physical materials (Ferreras, 2007). But, overall, one can argue that in today’s work, in order to be able to “recognize yourself” in what you do, too often you have to take some risks for your health. Being able to recognize yourself in what you do becomes a risk to take, even if that risk involves the body and the mind

in a different way every time. Let us be clear: here, we are not judging the coherence of these workers' behavior, and we do not believe that their health is better protected when they do what they do. It is clear that they put a lot of effort in their work. Their desire to produce, no matter what, metal bars to the highest production standards, ruins their health. But, paradoxically, it also protects it, because it is by taking risks for their lungs that their work becomes "defendable" to their eyes. In other words, they take the risk to live at the price of their health. That is certainly not a "reasonable" behavior for those who try to spare themselves. It is obviously an exaggeration to expose yourself to danger in such a way. But such exposition is clearly vital for them. Can we see in all this the effect of a certain "recklessness", a "taming" that did not work out well, or a dangerous resistance to self annulment which expresses itself with a need for life exactly where death lies around? The protection of their health would it be a weakening of their own vitality? Standing at the "mouth of the oven" is something that probably has the status of a vital protest against the dilemmas in which these workers are involved. By defending themselves they compensate the bad quality of coke used in the oven. And the management believes that they can suffocate under the soft blanket of a prescribed "well-being" such a conflict about a "job well done". For these metallurgic workers the quality of metal bars, which is not different from the quality of their work "gestures", is worth the risk of living, even dangerously. We can question them, but not by transforming the conflict about a "job well done" in sanitary taming.

The current hygienism is mostly about this transformation. Those who work are more and more pushed to ruin their own health in order to save it, in the name of a certain idea of work. And companies obey too easily to a certain temptation: to re-define work situations that appear "fragile" or "close to the break point", filled with those kinds of organizational dilemmas that we mentioned above, as personal fragility or vulnerability. The temptation to "reform" behaviors instead of transforming the situations leads to "fix" workers in order to "sterilize" the real content of activity and to clean it from those conflicts. The current management of psycho-social risks is particularly

representative of such hygienist temptation. It takes to the limit a classic device of professional risks management: the translation of a social problem of work into the language of sanitary danger (Jorland, 2010). All of a sudden, and in a specific way, such translation de-ranks as “weak subjects” those who insist in acting for the better, even in degraded situations, in order to preserve the idea that they have about what is a job well done. Thus, for example, if one uses indicators that are typical in certain plans against psycho-social risks in order to interpret the attitude of our metallurgic workers, they could be described as dangerously affected by an “obsessive search of perfection” (Clot, 2010). It is their “psychology” that induces them to take risks, because they insist in feeling responsible of a “super quality” which is not demanded. They should renounce to it, for their own “good”. Such a “dangerous conduct” is then reduced to a “pathology of will” (Peretti-Watel, Moatti, 2009: 98).

Following this line of reasoning, the best one could propose to the mass of workers in similar cases is to take charge of their own vulnerability (Thomas, 2010). It is necessary to help their will to “straighten up” their behavior, while they try, instead, to “straighten up” work situations that are made vulnerable by the short term commercial tyrannies. This reversal allows a cheap reassurance. It is a bit like if, in enterprises, some “humanitarian corridors” on the “economic battleground” would be opened, as far as the mental health at work is concerned. This is, indeed, the function itself of plans against psycho-social risks: to add the management of risks to the risks of management, by further extending the field of management to the psychological engineering. On this pathway, it is workers’ stress that has to be healed, while it is work that is sick instead, because workers are prohibited to take care of it.

Toxicological model and psycho-social risks: a consensus?

When one knows what happens in the real work, one can gladly share the resentment of some ergonomists. F. Daniellou writes: “Today there is a lot of talk about psycho-social risks as it was a toxic cloud hovering over the enterprise or some of its components, hitting the workers, mostly those that are

fragile because of personal characteristics. According to this model, the atmosphere is a bit corrupted and the most sensitive people have problems. The measures taken correspond to the model: sampling from the atmosphere can be performed (in order to measure the psycho-social environment). Dosages on workers can be made (in order to assess the risk they run). A system of reciprocal signaling can be activated (to alert when a colleague is not doing ok or he is judged as fragile). Those who are already intoxicated might be helped, for example by offering a psychological support paid by the company, just like the victims of carbon monoxide are treated inside a hyperbaric room. The goal of all these means is to avoid that the cloud makes too many victims, especially those ones whose intrinsic fragility could push them to a suicide attempt, since the consequences of this are damaging for the organization and the brand reputation" (Daniellou, 2009: 40).

When one begins from a patient clinical analysis of work situations, as we have done before, it is easy to realize that there are two opposing approaches. A first general approach to the problem through the "exposition" of workers to an undefined "risk", and a second approach - which is general as well - which refers to another kind of exposition: the exposition of the work quality to a conflict of criteria within work itself. In this latter perspective, the "psycho-social" cannot be seen as a risk. It becomes, on the contrary, the object of a "deliberate activity", a source of social and organizational vitality. It is also a resource to be developed, and the greatest psycho-social risk is, from this point of view, the social denial of conflict on quality work. Facing this situation is possible for "social partners" who are determined not to cheat with real work. But these problems are badly treated in the legal frame of French industrial relations. They oblige to find new meetings points in order to negotiate objects that are different from stress or psycho-social risks. In this perspective, the world of managers will have to change its position, because the management by objectives will not be enough. In this perspective, even the world of employees and the unions will be destabilized in their traditions (Ferreras, 2007). But, for all, nothing is worse than this "toxicological" model of

the psycho-social risk. The warning of F. Daniellou can be agreed upon: "The consensus on this model is increasing in many domains. In the face of the tragedies that already happened, the unions feel relieved that something is initiated by managers, with the guarantee of external specialists. It is not rare to find in union fliers some detailed, educated descriptions about stress measurements that conform, in total good faith, to the same terms appearing on managers' presentations" (Daniellou, 2009: 41). It is certainly necessary to be clear: it is not the principle of the agreement between "social partners" that has to be questioned. This is part, on the contrary, of the "normal" life of work environments. What is questionable is the object of negotiations that, by polarizing on an undefined and uncertain idea of "stress", may cover up conflicts that will keep poisoning the real work under a surface psycho-social consensus.

The measurement of stress: a solution?

Such a superficial consensus was built in France upon what was presented as common sense; however, it shows a sort of false social and scientific naivety. Such naivety can be found in high dosage in the hurried-up question asked by the French State and the answer recently provided by the Nasse-Légeron (2008) report. First of all, the idea is that France is late and that other European countries already proposed a roadmap for a solution. We would not enjoy the consensus that can be found in other countries, from neither a social point of view nor a scientific one. First of all, because "there is no consensus on the identification of causes of psycho-social risks, on their amount and presence and, even more, on the meaning of actions that could be taken in order to prevent them, to fix them or to get rid of them". The report "recommends to begin from observation and measurement" (Nasse-Légeron, 2008: 5, 17). Observation is immediately subordinated to measurement, "so that it can be disputable as little as possible and, thanks to its neutrality, it can serve as a basis for the recognition, by all interested actors, of the nature, the extension and the intensity of the evoked risks" (*ibidem*: 5). After all, the authors

of the report recommend to rely on international standards of measurement in order to get closer to a “global indicator” (*ibidem*: 22) upon which negotiations could be later based.

Stress measurement lies at the very centre of this report, just like a certain idea of the connections between risk, exposition, danger and damage, a classic idea derived from the British *Health Safety Executive*: “Risk is defined as the probability that a certain exposition to danger generates a damage, and the prevention strategies must make sure that the exposition is clearly under the level at which damages can be generated” (p. 8). Thus, the global indicator would have the function to calculate the exposition level allowing to predict the verifiable damages in order to decide the action to be taken. This synthetic approach likens, *de facto*, the psycho-social risk to a radio-active risk or a toxic risk, and it arrives to an expert assessment of the intensity and damage thresholds – and everything is guaranteed by the “neutrality” of the measurement. There are clear objections to be made.

The first objection is very old, a classic in the analysis of work, definitely a solid one. Reinforced by the example that we provided at the beginning of this article, the objection was proposed by A. Laville in a discussion about epidemiology: “Epidemiology is weak in the identification of risks and in their management by the operators. It does incorporate the notion of exposition, therefore assuming that operators are passive in a risky environment. It is often inclined towards emphasizing a specific risk factor, not a combined, interactive set of non specific risks. This happens, in part, for methodological reasons (the size of the sample increases with the number of variables). Epidemiology builds its methods on *a priori* hypothesis about risk – health relationships” (Laville, 1998: 154). A. Laville, however, did not invalidate the relevance of quantitative data for the nurturing of social dialogue or even the dialogue between operators. Others after him emphasized its interest (Volkoff, 2005). But he showed that dialogue within the enterprise runs the risk – a real one – of being “formatted” by an *a priori* scientific scrutiny focused on specific risks attributed to presumed “passive” workers. He opposed a “clinical analysis of activity”

which investigates where are the risks, without defining them *a priori*, because those non-specific risks always depend on the context.

It is certainly possible to think that it is necessary to exit from the context; that with an analysis based on the quality of work the general is not opposed anymore, *a priori*, to the contextualized, and that, in this way, it is possible to avoid the opposition between the psycho-social risk and the psycho-social resource. This is possible only if one accepts the idea of Laville: it is the actual activity of workers that solves the problem; certainly, not just the expert protected by the artificial consensus of measurement. If this illusion is perpetuated, this kind of consensus is, at the same time, a very dangerous one about the presumed passivity of workers. Then it should be recognized that it is quite the opposite – first, of neutrality and, second, of reality, and even of the results from several decades of research based on work analysis (Clot, 1999; 2008; Maggi, 2003).

Our disciplines, indeed, never ceased to establish that the real work life is precisely the transformation of perceived constraints into tests that are “lived” to be passed, sometimes at a high price, often experiencing what one is able to do without even realizing. Surveys on stress do not ask many questions about such experience, which, nonetheless, is a tangible proof of health. This is because interviewers mostly look for the damages – thus, the disease – and this is already a choice. But one would hope that this is also the proof of their professionalism: maybe they know that for interviewees it is easier to deplore what has been done to them, or to indicate what should be changed, rather than talking about what they do.

The second objection breaks again a fake consensus which is implicit in the definition of stress itself. According to the Bilbao European Agency for Work Health and Safety – and the following is the definition accepted by all social partners in the inter-professional agreement of 2008 – occupational stress appears “when there is an unbalance between someone’s perception of his own constraints imposed by his environment and his own resources to face such constraints”. Stress is seen as an adaptation disorder occurring when

professional demands make it impossible the individual's adaptation to his environment. Stress results from an unbalance between the resources of the individual and the environment's demands. This definition is very similar to the classic one by Lazarus and Folkman (1984): the psychological stress on the workplace is a response of the individual to the demands of a situation in which he doubts he possesses the resources necessary to face them. Consequently, stress is not a function of the absolute level of demands, but a function of the perceived gap between the organizational demands and the individual's capacity to face them. Thusly defined, stress is first of all a "perception", a "doubt" of the operator, who does not evaluate his own personal resources as adequate to face the organizational constraints.

This widespread definition of stress is very questionable. First, because it transfers the concept of stress from its original field of biology to the field of psychology. But, even more, because the exact opposite of what the definition enunciates often happens, as we have shown (Clot, 2010). It is the prescribed work organization that lacks the necessary resources for the demands of operators insisting in their will to do a quality job. The metallurgic workers that we saw at the beginning are very far from being "too small". It is the prescribed work organization that keeps them on a short leash. Besides, workers are absolutely sure of this - whether wrong or right. And it is precisely this "perceived gap" between what should be done and what they are asked to do that creates "unbalances" that are damaging for both their health and their work quality. When these "unbalances" cannot be compensated anymore by using a collective "diapason" of a deliberate action between them and with the management, the enterprise, even indirectly, cuts down their possibilities. By reducing the potential extent of their activity, and locking them in one possibility only, the enterprise diminishes them by degrading their power to act upon situations and themselves (Clot, 2008). One could see this kind of situation as an "adaptation disorder", but this is better defined as an adaptation of the organization to the needs of work, as shown by the risks taken by the metallurgic workers.

The hampered work

Sure, this approach to the problem does not exclude the former approach. Many workers doubt about their own capacity and it also happens that such doubt is reasonable, a fact that justifies the investments made or to be made in professional training and education. But one should not confuse things. When the imposed work influences the meaning itself of the professional activity, the latter can become dramatically insignificant for the operators. In that case, a sort of detachment from daily activity happens; a detachment between the real concerns of workers – a certain idea about work and themselves at work – and the immediate occupations opposing them. The sense itself of action is lost when there is a disappearance of the relationship between the goals that one has to subdue to, the results to which one has to accept to be constrained to, and what really matters for oneself and the work colleagues in the specific work situation. We have seen that what really matters – sometimes in a vital way – allows to envision other possible objectives about quality as compared to the expected quality of prescribed objectives. Then, the loss of sense in the activity takes away its vitality, its first destination is lost and so the prosecution of work is made psychologically artificial. Then, one is active without feeling active. Even the performance loses its psychological function, if one does not feel comfortable in the situation. The goal of the demanded work becomes psychologically foreign to the activity of subjects whose object is elsewhere. Actions performed rival in their activity with those that should and, most of all, could be performed. The psychological reality of these conflicts within the object itself of work is the source of powerful affects that find less and less a destiny favorable to the risk – as we have seen – of pushing those who work to take risks for their own health.

More generally, in this conflict of goals which appears today in many work environments, lies a paradox that – this one for sure – concerns directly issues of mental health: once disinvested, the achieved goals lose their sense, and those goals that one cares about and that remain unachieved, deprived of

their social realization, are discredited at the same eyes of many workers just like cumbersome chimeras. Imagination itself becomes for them a hurdle to overcome in order to work "normally". Many human dramas at work find their origin or their content right there, when the situation materializes and prevent workers to think, wrong or right, that a change would be possible. When a discussion about work quality becomes impossible, super-activity and lack of meaning constitute an explosive "psycho-social" mix. It's a sort of idle activism that can be transformed into a pathological inflammation even by a minimal managerial injustice. But this is just the needle breaking the back of the camel of a vexed professional life. Because passiveness is always just a "repressed" activity, an inhibited or imprisoned development, something disastrous for health and work effectiveness.

Healing work, getting out of denial

The least one could expect from experts is that they take seriously the lucidity hidden behind the possible passiveness of workers, when it appears. The least one could expect is that they do not put even more weight to the considerations already extensively thought out by workers with measurements of risk exposure which confirm that danger is real and end up on a fictitious compassion. One could object that the reflection is far from being at the desired end point, in order to justify the generalization of questionnaires that are used today. But it is possible to answer by stating that many tools for stress or psycho-social measurement that are used do not allow to increase the wisdom of managers, to whom they are directed. That's because they are not made in order to clarify the problem of a job well done in the enterprise, the problem of its object, its products or its performance criteria, but, instead, they are made in order to increase the surveillance of workers' "well-being". There is, at the origin of this increasing exploitation, the worry to heal people where, instead, it is work that needs to be healed, in every sense (Fernandez, 2009). At the origin of the problem there is also the suppression of the relationship between "well doing" and "well being", with few exceptions, while such relationship is

crucial. It is the problem of current hygienism, which is nothing but the denial of conflict over the quality of work.

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Work related stress: from risk assessment to prevention

Giovanni Costa

Università di Milano, Fondazione IRCCS Ca' Granda – Ospedale Maggiore Policlinico

The scientific literature concerning occupational stress has dramatically increased in the last years, thus testifying the growing importance of this risk factor and the consequent attention paid by researchers and experts in the different disciplines, especially psychology, medicine, ergonomics, sociology and work organization.

In the two most recent surveys on working conditions, carried out in 2000 and 2005 by the European Foundation for the Improvement of Living and Working Conditions (EURF), stress ranked in the first place, together with musculoskeletal disorders, among the health problems reported by workers. Most international organizations (WHO, ICOH, ILO, NIOSH, EURF, HSE, INRS, OSHA-EU) have published in recent years several reviews and guidelines on how to tackle this problem.

All this proves the great relevance of the problem which is extensively investigated as to the main determining factors and the corrective and preventive action strategies. Scientific knowledge quite clearly evidences that stress may be a risky condition if the individual is not able or made able to properly face it.

According to the most well-known interpretation models, work-related stress is the product of a dynamic interaction between the individual and her/his organizational and social context where he/she works, being the resultant of a (distorted) relationship between pressures posed by the task, in its broadest meaning (physical, cognitive, emotional, relational), and the operator's ability to face them (in terms of psycho-physiological, behavioural and operational "response"). Hence work stress can be defined as an altogether of

harmful physical and emotional reactions arising when work demands are not in line with workers' skills, resources or requirements.

The items affecting the first factor ("work demands") concern nature of task and work organization, in particular: a) work content (e.g. complexity, unpredictability/uncertainty, control, meaning, attitudes and skills); b) work load and pacing (physical/mental, over/under load, time pressure); c) degree of responsibility and severity of consequences of errors; d) working hours (prolonged, irregular, variable, shift and night work); e) participation/decision making level and career opportunities; f) active or passive mobility; g) role in organization (ambiguity and role conflicts); h) education and training (level of adequacy); i) functional and organizational culture (communication, management); l) human relationships (conflicts, isolation, lack of support); m) work-home interferences (family burden, commuting, poor social services).

On the other hand, the factors affecting individual's coping resources and strategies concern manifold personal issues such as age, personality, family situation, lifestyles, professional education and training, behavioural attitudes and health status. Besides, they are all affected by social factors such as the integration modalities (relationships, communications, support) of the subject within the working group, the family and the society in general.

Hence, work stress, which is not necessarily an *a priori* negative issue, may become a harmful condition for health if the above factors are unbalanced, so that the individual is not able to properly cope with the stressors he/ she has to face.

Among the number of theories and interpretation models proposed in the past to try to describe and interpret stress dynamics and epidemiology, let us mention the "Job Demand-Control-Support model" by Karasek and Theorell (1990), and the "Effort-Reward Imbalance model" by Siegrist (1997). According to the former, higher stress levels (and hence higher risk of health disorders) are associated with conditions where a high workload is not joined and supported by a sufficient decision-making involvement and an adequate social support. According to the latter model, a stress condition starts when there is not a fair

relationship between required “effort” and received “compensation”, not only in economic terms, but also as a social satisfaction and reward, particularly in individuals with overcommitment.

The literature documents that stress is involved, via different physiopathological and psychorelational mechanisms, in the pathogenesis of a large number of acute and chronic troubles and diseases affecting different biological systems and apparatuses, such as cardiovascular, gastrointestinal, neuropsychic, skin, endocrine, metabolic and immunologic ones, as well as in terms of neoplastic degeneration, and it has also a negative impact on family and social relationships.

Many epidemiological investigations highlight, in different work sectors, a higher risk of general and specific morbidity for those displaying higher stress indices. As concerns the cardiovascular risk, for example, a significant relationship arises between ischemic heart disease risk and hypertension and chronic stress conditions, defined through both the Job Demand/Control/Support model and the Effort Reward Imbalance model (see also Kristensen, 1989, European Heart Network, 1998, Belkic et al., 2000; 2004, Kornitzer et al., 2006, Peter et al., 2002), in spite of the difficulty to fully understand the mechanisms (Chandola et al., 2008) and to control other confounding factors (Kivimaki et al., 2008).

As to neuropsychic disorders, a recent meta-analysis by Netterstrom et al. (2008) concerning 14 longitudinal studies in several countries, showed a close relationship between high job strain conditions , or effort/reward imbalance, and depression, with an overall relative risk equal to 2, whereas the social support has a remarkable positive impact in reducing depression risk (RR=0.6). Similar results were reported for many other chronic disorders (Ostry et al., 2003).

The European Agreement on occupational stress of October 8, 2004, resumed in art. 28 of Law Decree 81/2008, acknowledged (though with some contradictions and inaccuracies) such acquisitions and provided some general guidelines on how to concretely tackle the issue at workplace. It explicitly

invites to enact “different measures to prevent, eliminate or reduce the work-related stress problems (.....) that may be collective, individual or both”. Among these actions, explicit mention is made of “management and communication measures” aimed at clarifying company goals and workers’ roles, providing adequate support to individuals and working groups, developing more coherence, responsibility and control on work, improving work organization, processes, conditions and environment, informing and training managers and workers to improve their awareness and understanding of stress, its possible causes and how to tackle it, and asking for participation of workers and/or their representatives in accordance with European and national legislation, collective contracts and good practices. The recent Law Decree 106 of August 3, 2009 (“Integrating and corrective instructions of Law Decree n. 81 of April 9, 2008”) added the need to account also for the “specific contract type regulating the work performance”, beside the differences in gender, age, and origin from other Countries, already mentioned in art. 28.

No doubt the need to concretely tackle the problem is also due to the dramatic changes occurred in the last years in our country concerning labour market structuring and work organization, that highlighted this key problem to an even greater extent. This is connected in particular with the ever increasing employment in the tertiary sector (65%), the rise in market globalization and international competition, the new information technologies, the increasingly variable and irregular working times (“24-h Society”), the different kinds of employment more and more characterized by precarious jobs, the progressive aging of population, the increasing employment rate of women, disabled, and people of different ethnic groups and cultures, the home/work conflicts (work/leisure times, commuting, social services), and the changes in professional needs and expectations of the young generations.

It is also noteworthy that work-related stress is a high cost not only in terms of health, but also of work efficiency, documented by high levels of absenteeism and turnover, higher incidence of errors and accidents, poor fulfilment and application of safety procedures, low sense of membership and

team spirit, poor initiative and reduced productivity. Several studies evaluated direct and indirect economic costs associated with stress. For example, the yearly costs are about 4.2 billion Swiss francs, equal to 1.2% of GNP, including medical expenses, sickleaves and production losses (Ramacciotti, Perriard, 2000). In the UK the working days lost every year because of stress-correlated problems are approx 40 millions (CBI, 1999). In the USA the cost of stress in 1998 was calculated to be 22,5 billion dollars (Leigh, Schnall, 2000). In the European Union the overall cost of stress was assessed to be over 20 billion euros, including working, retirement and social costs (Houtman et al., 2005).

On account of the peculiar characteristics of work-related stress, whose onset and manifestations are multifactorial and multidimensional, risk cannot be assessed with a shared-out or mechanistic approach ("dose/responses" or "dose/effect") like the one used for traditional chemical-physical factors), but with a systemic approach with the concurrent support of biomedical, psychosocial and organizational expertise. Hence assessment criteria are more "relative" than "absolute": there are no TLVs or rigidly fixed thresholds; but this does not mean rough or limited judgement.

Moreover it is worth distinguishing risk assessment for groups or individuals, due to the remarkable inter- and intra-individual variability, and in view of preventive rather than corrective actions.

At group (company, department, homogeneous group) level, it is necessary to evaluate which is the epidemiological relevance of the problem and which is the etiological fraction ascribable to work-related stress, followed by preventive and corrective actions that have to be assessed in terms of cost/effectiveness ratio. As to the individual, it is necessary to carefully evaluate the biological plausibility of effects on health with relation to physiopathological mechanisms of stress, their causal and/or concausal attribution to the latter, and the prognostic value of enacted therapeutic and compensatory actions: this has to be considered in terms of risk/benefit ratio.

Risk assessment will obviously have to take into account an accurate analysis of working conditions, using job analysis techniques and check-lists

based on observational models and objective data (e.g. organizational and functional charts, work schedules, workloads, operative procedures, environmental conditions, external context, personnel management, etc.). It is also worth observing the subjective perception of workers, also via structured or semi-structured interviews and filled-in standardized and/or ad hoc questionnaires.

It is also necessary to analyse the possible individual's strain, that may become apparent in different ways and associations, such as physical symptoms and signs (e.g. headache, insomnia, digestive and cardiocirculatory disorders, chronic fatigue, etc.), mental ones (difficulty to concentrate and memorize, proneness to mistakes, etc.), emotional ones (sadness, depression, anxiousness, nervousness, loss of enthusiasm, confidence and self-esteem, reduced motivation and dissatisfaction at work) and behavioural ones (increase of alcohol and smoke, inability to withdraw from work obligations, poor self-esteem, antisocial behaviours, family conflicts, frequent leaves).

Further useful indications are provided by analysis of operative behaviours (procedural choices, performance, errors, violations, accidents, injuries) and peoples' physiological responses (e.g. hormonal secretion, heart functionality, mental activation, sleep, etc.).

Besides, it is necessary to carefully investigate morbidity (and associated absenteeism) regarding psycho-somatic (e.g. cardiovascular, digestive) and neuropsychic disorders (depression, anxiety, sleep chronic diseases, burnout).

Analysis of absenteeism is considered as a useful indicator of stress-related discomfort. Apart from the manifold factors combined to bring it about, it is convenient to consider that it may also provide false information if not correctly contextualized. For example, it is clear that under labour market restriction conditions with work at risk (and hence high stress for the individual), it is more useful to carefully assess the presenteeism, that is the number of people going to work in spite of poor psycho-physical health conditions. The same holds for turnover analysis.

Assessment of work-related stress has to be necessarily addressed to preparation and implementation of reasonable and practicable stress management strategies, that have to deal with work organization and people's operative and behavioural modalities, in addition to a careful health surveillance.

Since there is a great variety of potential stress sources and factors (and hence people's consequent response modalities) according to the different organizational contexts and characteristics of concerned people, it is often impossible to tackle them all at the same time. This often results in a superficial (if not even counterproductive) analysis, which helps little in defining an actual action plan. Therefore it is appropriate to proceed step by step, by identifying the major aspects that are more likely to be further investigated and then by taking adequate actions. For the same reason, there cannot be one action or one solution only, but it is necessary to develop manifold and/or diversified action strategies at organizational and individual levels.

Beside the tools to be selected and used in an appropriate and integrated way according to the specific situations to be considered, it is worth highlighting that above all the methodological approach is the one able to evaluate risk assessment effectiveness and hence the subsequent delicate step of risk management.

A key condition for actions on work-related stress to be effective and lasting in time, is fixing a firm involvement and commitment by management jointly with workers and their representatives. Consequently they need: to be sufficiently acquainted with work-related stress and psychophysical strain (and hence the need for an effective information and education at all levels), a real interest in changing the situation, the awareness that actions on individual, but for a few cases, do not replace organizational actions but integrate them, the conviction that such actions are able to improve the organization's overall quality.

Therefore it is necessary to be careful when defining not only the modalities and content ("what" and "how much") but above all the action

procedures ("how and "when"). Actually we have to be aware that time, even a long time, may be necessary to let people actually realize the problems, understand the knowledge and analysis tools, carefully consider the situations, find shared assessment criteria, identify concrete and verifiable objectives, define priority actions, prepare possible amendments, check their actual usefulness, and make up for possible deficiencies.

Much attention must also be paid to the utilization of tools that are often proposed, selected and used in surreptitious and make-shift ways, just to formally comply with law obligations. This may be, for example, the case of improper use of some investigation tools, such as more or less validated and standardized questionnaires or pre-established check lists, that are aimed at supporting unskilled people, but however may induce too a rigid assessment of the issue at stake, and make the subsequent interpretation of collected information quite difficult (however more in terms of "hazard" than "risk").

The consequent action strategies can be implemented following three lines: individual level (lifestyles, behaviour, education, training, support and therapy), small group level (relationships, communication, roles, tasks, leadership, cohesion and collaboration), organizational level (physical and relational environment, working time and pacing, functions, participation and control).

Our experience, based also on several literature findings, teaches us that setting up an *ad hoc* working group on work-related stress assessment and management is very useful, if not even strategic. It shall include workers and management (with people having actual management power), be supported by proper resources (times, materials, places), have a clear mandate and the concrete power to provide indications/recommendations to the company Management. *In primis* it shall include the stakeholders as indicated by regulations (employer's representative, prevention and protection department head, workers' representatives, company occupational health physician, human resources managers) and be supplemented by department or significant group representatives in the specific company context (e.g. technical supervisors,

women, elderly workers), as well as by possible external experts (e.g. psychologist, sociologist, cardiologist, etc.).

Actual examples of good practice should be provided as reference points and spurs to continue actions and involve sceptical or reticent people. A large number of studies clearly show that when factors at stake have been carefully examined, corrective actions led to significant positive results in terms of workers' health, and company organization and costs (LaMontaigne et al., 2007).

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Stress at work: risk evaluation and prevention

Giovanni Rulli

Azienda Sanitaria Locale della Provincia di Varese, Direzione Generale

The term *stress*, commonly used, assumes different meanings based upon the disciplinary context in which it is used and according to the objectives of those using it. There exist significant differences, for example in the use of the term in the medical (which include physiology, occupational medicine, pharmacology, neurology, biochemistry, endocrinology, etc.), psychological, law and social disciplinary fields.

Within the *European agreement on stress in the work place*, signed October 8th 2004 by organizations of employers and workers, the adopted definition of stress was: *"Stress is a state, which is accompanied by physical, psychological or social complaints or dysfunctions and which results from individuals feeling unable to bridge a gap with the requirements or expectations planned on them. The individual is well adapted to cope with short-term exposure to pressure, which can be considered as positive, but has greater difficulty in coping with prolonged exposure to intensive pressure. Moreover, different individuals can react differently to similar situations and the same individual can react differently to similar situations at different times of his/her life"*

Among the possible definitions, this is the so called "psychological" one, where *stress* is interpreted as a particular *relation between the individual and the environment, which is evaluated by the individual as an interaction that tests or sometimes exceeds his resources, putting his well-being in jeopardy*. *The fact that a particular relation between the individual and the environment is stressful or not depends on a cognitive evaluation* (Lazarus, 1966; Lazarus, Folkman, 1984).

Many commonly used guidelines follow this definition with significant consequences for prevention (INRS, 2006; European Agency for Safety and

Health at Work, 2009; ISPESL, 2010; Comitato Tecnico Interregionale della Prevenzione nei Luoghi di Lavoro, 2010). Possible measures to prevent, eliminate or reduce stress seem confused in the European agreement of 2004 (“specific measures for each stress factor... anti-stress policy... training and information...”). This again demonstrates how the term *stress* is used like an “all encompassing” word with wide ranging ideas on unspecific psychophysical uneasiness. The consequent guidelines for evaluation and prevention fragment and overlap content, context, changes, “organizational and psychosocial factors” and individual characteristics. At the same time they propose “objective” indicators of stress and ways of evaluating subjectivity (usually questionnaires) arriving at suggesting ways to manage stress individually.

Essentially there are two serious weaknesses that we can identify with this approach. The first weakness is the one that distinguishes and extrapolates some “organizational factors” that, in reality, are only inherent to the management of time, relations and hierarchical communication. This does not take into consideration the more complex synergy of choices, decisions and actions (even institutional and technical ones) that in the work process involve the management of the company and its workers in any hierarchical level. A “healthy” organization, from the view point of possible stress, would be able to, in simple terms, operate information and training and pin point various “company strategies”, including the reduction of time pressures (shifts, work rhythms, etc.) the acknowledgement of psychological violence (mobbing, gender bias), the diffusion of the idea of “work responsibility” and a generic social “support” (“climate”?). The second weakness is to attribute to the individual cognitive evaluation, conscious or not, a sort of “responsibility” to possibly activate the stress “mechanism”. On one hand, this is a way to sustain and promote the innate or acquirable strategies of coping, which is the positive cognitive elaboration of *stressors* (increasing the limit of tolerance). On the other hand, using both the evaluation of subjectivity and the identification of the “psychological and social” signs and symptoms of stress (symptoms that are unspecific and that seldom show themselves at an early stage), we allow for a

paradoxical and hidden search into “healthy and robust cognitive constitution”. This, in spite of the fact that, after decades of debate in Italy, in the 90s we succeeded in ridding of these concepts and the related health certification of “healthy and robust physical constitutions”¹.

When we speak of *stress* I sustain that it is necessary to refer to the original work of Hans Selye. This physician and pharmacologist who was also for many years director of the International Institute of Stress at the University of Montreal first started his research in the 1930s and published his first original research on stress in 1936 (Selye, 1936). But the most complete study on the subject was in the 1256 pages of his most famous book, *Stress in Health and Disease*, which came 40 years later (Selye, 1976a). Also in 1976 he wrote an important paper, a sort of theoretical synthesis, in order to clear up various misunderstandings and inappropriate uses of his concept (Selye, 1976b). In this paper Selye identifies 10 main problems that, at that time and even today, emerge within the clinical application and in the use of the concept of *stress*. These problems are: the different definitions of stress; the specificity and non-specificity of stimuli and responses; the direct and indirect pathogenesis; the diseases related to adaptation; the influence of genetic and environmental elements and the “active” control of stress; the relations between the General Adaptation Syndrome and the Local Adaptation Syndrome; the biohumoral mechanisms and the role of the “primary mediator”; the prevention and pharmaceutical and behavioural treatments of *stress*. Selye also wrote, just before his death in 1982 and then published 5 years later, an article in which, while compiling 11 years of work, he had to again clear up especially what stress is not (nervous tension, hormonal depletion, a deviation from homoeostasis, alarm reaction, etc.) (Selye, 1982).

¹ The article 22, Law February 5th 1992 n° 104, “Law for the assistance, the social integration and the rights of people with disabilities” established that “*for the employment in public and private work the certification of healthy and robust physical constitution is not required*”.

With the term *stress*, indicative of neuroendocrine activation both complex and *unspecific* ("specific" stress does not exist), the aspects of solicitation (*stressors*) and the aspects of a "stereotyped" response are studied in relation to one another in the *General Syndrome of Adaptation* or *Syndrome of Biological Stress* within. With this syndrome we recognize an alarm reaction, a resistance phase (adaptation) and an exhaustion phase, with related biochemical alterations (e.g. hormonal, focused on the release of corticosteroid and catecholamines), morphological alterations (e.g. in the glands) and functional alterations (e.g. neurological and cardiovascular). Once the homeostatic capacity is exhausted, the organism can manifest the afore mentioned *diseases of adaptation*, that is, the inability to adapt to stress. This is a list that can include shock, gastrointestinal illnesses (like peptic ulcers, colitis, etc.), cardiovascular illnesses (hypertension, etc.) hormonal disturbances (diabetes mellitus), changes in the immune system (immunodepression, autoimmune diseases, etc.), "psychosomatic" illnesses (allergies, asthma, dermatitis, etc.), and even organic psychosis and, lastly, neoplasms (Selye, 1976: 725-896).

Therefore, with the term *stress* both causal aspects and the effect emerge; the effect can even manifest itself independently of the cognitive intervention, contrary to what has been affirmed by theories that are in direct conflict to Selye (as in Lazarus and Folkman), and also by theories that, while declaring their reference to Selye's theories, in reality they actually "appropriate and force" them. Selye doesn't negate the importance of the cognitive aspects, and affirms the following: "*Undoubtedly, in man, with his highly developed central nervous system (CNS), emotional arousal is one of the most frequent activators. Yet it cannot be regarded as the only factor, since typical stress reactions can occur in patients exposed to muscle fatigue, trauma, hemorrhage, etc. while under deep anesthesia*" (Selye, 1982). The fact that the psycho-neuro-endocrine immune activation of stress is a complex event, and not a "serial" one, is also demonstrated by unspecific neuro-hormonal manifestations, even after the surgical removal of the

fferences to hypothalamus or under general anaesthesia. At the same time, as stated by Selye, stress is neither synonymous with "emotional stimulation-excitement" or "nervous tension", nor it has a negative significance. "*the act of being alive requires energy ... complete freedom from stress can only be possible after death*" (this is how the concept of *eustress* is introduced, distinguishable from *distress*).

On the contrary, it is true that a stimulus can be both a *stressor* and an activator of specific effects. Further conditioning elements, whether they be endogenous or exogenous, can determine the reaction of the "exposed" organism.

The fundamental difference between the concept of stress by H. Selye (which, it could be argued, provides a "psychoneuroendocrine" definition), and stress according to the "psychological" definition, I believe is in the different answer to the questions: "What is the stimulus that alerts the organism about a certain danger, or about an increase of requirements?" and "What is the mediator that, arising even from extremely different stimuli, leads to the same message the centres that supervise the stereotypical response to the General Syndrome of Adaptation?".

In the "psychological" definition, the first passage, which is independent from the subsequent involvement of substances or neuronal transmissions, is the cognitive evaluation.

In the "psychoneuroendocrine" definition, the first passage coincides with the so-called *first mediator* intervention, that we thought-wanted to be a well defined substance, initially identified with histamine. This is an hypothesis that proved to be experimentally insufficient at explaining the numerous alternatives and exceptions. Today, after almost a century of research, I believe it is better to talk about a *first mediation*, that is, an articulated "cascade-possibility" of biochemical and humoral complex events (excess or insufficiency of chemical substances, nervous stimuli, etc.) implying multiple well known stereotypical responses (endocrine, neurological, immune ones) with variable intensity prevailing effects on organs and systems. The cognitive

component can be thusly considered, as I argued Hans Selye himself never denied, an important but not an exclusive “endogenous determinant” of the reaction of the exposed organism.

The fundamental consequence of this distinction is that the “combined whole of psychoneuroendocrine stress” is much more widespread than the “combined whole of psychological stress”. An approach to human work that is limited to considering as *stress* what is “evaluated” from a cognitive point of view doesn’t allow to acknowledge many possible harmful stimuli inducing stress (for example physical-chemical ones). On the other hand it doesn’t allow any possible *primary* preventive actions, which are meant to prevent the conditions and stimuli with potential unspecific harm from happening.

For that which concerns the prospective of *primary prevention of stress*, Selye does not reference scientific work that has systematically faced the question nor does he hypothesis convincing paths of research. Again, in the 1976 and 1982 contributions, he expresses ideas that range from a certain “philosophical common sense” (“the best way to avoid harmful stress is to choose appropriate environments ... to find gratifying activities ... and in this way we can live wisely in harmony with the laws of nature”), all the way to a recall of the “altruistic egoism” acknowledged by biology, psychology and epistemology of science², in a way, however, that could be understood as a sort of *captatio benevolentiae*. Not even the international literature on this argument, today numbered in the 200,000 articles written (just in the CMA Journal alone, where Selye published in 1976 his famous article that cleared up his concept, there have been 500 articles published citing stress in more than 30 years) has revealed a concrete approach to primary prevention.

For the *primary prevention of discomfort and suffering at work* it is crucial to understand what are the possible dimensions of analysis and interpretation of work situations that would be more useful in terms of choices with the most

²Among many possible references: H. Maturana e F. Varela, *Autopoiesis and Cognition. The Realization of the Living*, Reidel Publishing Company, Dordrecht, 1980 and the following *El árbol del conocimiento: las bases biológicas del entendimiento humano*, Lumen, Buenos Aires, 1984.

consistency between production goals and the well being of workers.

Some attempts to hypothesize prevention initiatives pay for the lack of a systematic approach, which needs the knowledge of possible theories and the available operative tools to make an analysis of work aimed at *primary prevention*. Even in all the numerous articles on *mobbing*, one finds varied proposals for intervention at the different levels of prevention. Among these are: better information and training (bringing awareness and acknowledgement to the phenomena), improving the skills of occupational physicians on the subject (but also family physicians, psychologists and psychiatrists), establishing protocols for behaviours in order to protect the rights and dignity of workers (even inserting clauses in work contracts), stimulating a cultural change that stigmatizes harassment, changing the leadership style, confronting “bad” work organization or the “organizational dysfunctions”, improving the company communication, creating a relational work “climate” by managing conflict with negotiation, promote total quality management etc.³

The proposals for preventative strategies formulated up until now do not appear to be comprehensive in relation to the whole problem of (*un*)specific *psychological and social discomfort in the work place*.

The “rediscovering” or addition of a descriptive clinical picture of the discomfort at work and the (re)classification of “professional illnesses”, more or less reduced to list with mere legal and insurance related value, are positioned too “downstream” in relation to the critical issues within the work place to be faced and solved. The analysis of work that relies on this approach is not only unsatisfactory but even counterproductive if the goal is primary prevention, and it can be criticized from the biomedical point of view, as I previously researched and stated in the 1990s (Rulli, 1996). The national norms that

³ See the critical essay on the definitions of stress, burn-out, mobbing and their consequences in Rulli, 2006.

followed the 2004 European Agreement, including the 2008/2009 Italian one⁴, do nothing but sustain this fragmentation. They both foresee a specific evaluation for stress related risks (almost as if beforehand it was not possible to spot this risk based on the interdisciplinary knowledge available) as well as indicate ways they can evaluate with *ad hoc* guidelines (as if ways to analyse work didn't exist in order to allow every possible risk to emerge). Specific evaluation and ways to evaluate are also based on the assumption that the risk of stress depends on "organizational factors" separated from choices that affect the environment, materials, techniques, etc. According to Bruno Maggi "The use of expressions like "organizational factors" (...) is a clear indicator of an uncertain and inadequate reading of the reality in the work place (...) every configuration of the work process is the result of choices of human action, *choices that organize*, in one way or another, those processes. The etiopathogenesis of the work situation is necessarily organisational" (Maggi, 2006).

The choice of a comprehensive approach to the knowledge of the work place exists, and it is needed to avoid fragmented solutions to the problems posed by the numerous risks to well being in the work environment, not only in the psychological and social realms.

As I sustained some years ago, in a biomedical contribution to the juridical discussion on suffering in the workplaces, it is important to recognize and to denounce the problem of injustice, of discomfort, of the "silent" psychical and social suffering at work, and to operate choices oriented to contrast this "barbarization" (Dejours, 2009), but it is also needed to affirm that a deep organizational knowledge of work itself is necessary to recognize the reasons of the rising of multiple possible risks in the workplace and it's

⁴ The D. Lgs. April 9th 2008, n. 81, modified by the D.Lgs. Augost 3rd 2009, n. 106, stated in art. 28 "Object of risk evaluation" that evaluation "... must concern all risks (...) including those related to group of workers exposed to particular risks, such as the ones connected to work-related stress, according to the European agreement of October 8th 2004 (...). The evaluation of work-related stress is performed according to the guidelines of art. 6 " (which states that the Consulting Permanent Commission for Health and Safety in the work place, constituted at the Ministry of Labor and Social Security has also the responsibility to "define the necessary indications for the evaluation of risk concerning work-related stress").

necessary in order to "recognize the different dimensions of origin of discomfort (in such way going upstream towards the sources of suffering)" (Rulli, 2006).

This "potentiality" for discomfort is recognizable with an analytical evaluation of the risk in the work process which utilizes *criteria* (instruments and methods that the theory offers to analyse reality) that are suitable for prevention.

An analysis of the work processes according to the *Theory of Organizational Action* offers a response to the need for *risk evaluation*, even within the meaning considered by the D.Lgs 626/1994, later reconsidered by the D.Lgs 81/2008. According to this Theory, the work place is pre-ordered through choices, decisions and actions (which are human, hence imperfect, incomplete, each with possible alternatives). These actions are continually being transformed and reformulated according to a "principle", not necessarily a perfect one, of congruency in relation to the goals. Therefore the work process can be evaluated not only in terms of efficiency and effectiveness for production (of goods or services) but in terms of relative congruency among its components, inseparable from the acting subjects. In this way, the evaluation extends itself to well being, as a crucial part of the "condition" of human beings in the work place. In this theoretical construction the concept of *organizational constraint*⁵ provides a type of categorical "bridge" between the interdisciplinary knowledge of work and the specific knowledge in the biomedical field on illness. This concept was defined by Bruno Maggi in the beginning of the 1980s as a *reduction in the freedom of choice by the acting subject in the process of actions and decisions*, which represented the escapable element of pre-ordination ("organizing" choices in human action). The benefit of organization carry with it the "cost" of constraint that, while far from being a "harmful agent", represent the limitation for the sensory, motor and cognitive abilities for the

⁵ The concept of *organizational constraint* was introduced by B. Maggi for the first time to the biomedical discipline at the 46° Congress of the Italian Society of Work Medicine and Industrial Hygiene, held in Catania in 1983.

human being in organized work, that is, the potentially pathogenetic character of organization (Maggi, 2006)⁶.

The organizational analysis of concrete work processes (not generic or typological ones) oriented towards goals of primary prevention, appears to be the only possible path to a description and an interpretation of the work place as a setting where well being is at risk. Any form of mono-disciplinary evaluation shows obvious limits of perspective in the choice of alternatives addressed at well being, and appears to reintroduce critical points only apparently resolved by very specific interventions based on simple cause- effect relationships. The interdisciplinary approach is the only one which allows the overall consideration of only apparently un-reconcilable perspectives on efficiency, effectiveness , quality and protection of well being at work. As a result such an approach is indispensable for the biomedical disciplines aiming to achieve goals of *primary prevention* (Maggi, 1984/1990; Maggi, 1990).

Over time the notions of primary prevention, secondary prevention and tertiary prevention became widely accepted, not only because of epidemiological reasons and evidence. *Primary prevention* is focused on reducing the diffusion of diseases by intervening on risk "factors", on "pathogenic causes", before they can lead to the manifestation of their effects. *Secondary prevention* consists of early diagnosis and therapy. *Tertiary prevention* is focused on preventing disabling outcomes and death. Today this distinction displays a rigidity that, on one hand, tends to segment the possible interventions and, on the other hand, restricts the sphere of interest and interventions of the relevant biomedical disciplines (hygiene and prevention, diagnostics and therapy, rehabilitation). In a similar way the distinction - which is present in the vocabulary of prevention in the work place - between (primary) *prevention, protection* (from risk) and *precaution* (based on the hypothesis of risk)

⁶The definition contained in the communication n. 71 (December, 17th 2003) of INAIL, entitled "Psychological disturbances from organizational constraint ..." and in its annex n° 1 "Report of the Scientific Committee" does not correspond to this original and stipulative (non descriptive) meaning of *organizational constraint*. Even more so, it is not possible to talk about "lists of constraints".

seems artificial as well. Obviously a real “primary” prevention should be based on a principle of precaution, addressed to all possible hypothesis of risk and extended to the “protection” when harmful agents have been admitted to the work place (something that shouldn't occur) or when work conditions imply a certain unspecific risk, like in the example of *stress*.

In conclusion it is possible to argue that the analysis of work, according to precise descriptive and interpretive categories that allow a concrete evaluation of the consequences of *organizational constraint*, offers a prospective of a real “primary” prevention, a perspective that works on the design of work before risk presents itself, allowing a return to the roots of possible harmful agents (specific and unspecific, chemical, physical or psychological) and to all possible combination of these agents. This kind of analysis is the aim of the *Interdisciplinary Programme of Research on the relation between organized work and health, Organization and Well-being* (O&W), coordinated by Bruno Maggi, Full Professor of Organization Theory in the Faculty of Economics at the University of Bologna and in the Faculty of Law at the University of Milan. Based on the Theory of Organizational Action (TAO) and formally instituted in the 1980s, after more than a decade of interdisciplinary research on work and health, the Programme aims to identify the links between choices (made and designed) in organizational processes of work and the health of people involved, defined in the O&W Programme and also expressed in the OMS principles as a *perfectible process of physical, mental and social well-being*. “Health is therefore perceived as a resource for everyday life and not like an end goal. The identification of health needs is not absolute but relative to the needs expressed by the person and to the shared societal norms regarding matters of priority. The definition of health shared by the O&W Programme is one of a *perfectible process of well-being*, an approach consistent to the evaluation of relations between organized work and health which analyses work as an organizational process” (Rulli, 1996: 35-36). The variety of disciplinary knowledge required by this object of study, biomedical, social, economic, psychological and poly-technical, is integrated in the utilization of the *Method of Organizational Congruencies* (OC) (Maggi,

1984/1990), derived from the Theory of Organizational Action. It should be recalled that a scientific “method” has to be understood as an orderly process of investigations and a set of criteria that the Theory offers to describe and interpret reality. The evaluation of congruency, the identification according to the *OC Method* of “conditions” that allow risk to take form and become real, can be logically located on a higher level when compared to forms of analysis, unfortunately widespread and prevalent, that declare to be oriented towards (primary) prevention. Often, however, these forms of analysis are not able to emancipate themselves from both a supposed technical predetermination, and also from an uncritical use of the definitions of work organization that are purely managerial, created in settings that most definitely are not oriented towards objectives of prevention.

The interdisciplinary Research Programme O&W promotes the analysis of work situations, ergonomic design, training and education. The research results are published and discussed in seminars, every 6 months. The first of these seminars occurred in 1989.

Since the mid 1980's until now, well before the most important law on prevention at work of the EU were emanated and before the European Agreement on stress of 2004, the O&W Research Programme has analysed many work processes and uncovered the risk of stress within, among others, the manufacturing and the artisanal sector, the tertiary services, the hospital and local health care sector. In each of these work situations the risk of stress became evident in relation to un-congruencies in communication, in the coordinating of individuals and activities, in the conditions of uncertainty and psychological burden, as well as in relation to the risk conditions from exposure to physical chemical agents and accidents. This way it was possible to demonstrate, consistently with the “psychoneuroendocrine” definition of Hans Selye, not only the potential stress and psycho-physical unspecific discomfort, connected with stimuli of a psychological nature (e.g., in the in-congruencies related to coordination and control and communication) (Cavallo, Mussano, 1990; De Filippi *et al.*, 1990; Rulli, D'Orso, 1994/2010; Maggi, 2008), but also the

proven possibility of stress in relation to exposure to harmful chemical/physical agents (Maggi, 1986; Salerno, Guglielmino, 1990) or to situations of risk for workers' safety (Festa *et al.*, 1997; De la Garza *et al.*, 1998) as well as a wide range of analysis cases in the field of health care (Maggi *et al.*, 1990; Rulli *et al.*, 1990; Cristofolini *et al.*, 1991; Rulli, D'Orso, 1994/2010; Rulli *et al.*, 1995; Rulli *et al.*, 2000; Maggi, Rulli, 2006).

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