

# Knowledge work and stress – between strain and enthusiasm

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## Introduction

Increasingly, it is reported that knowledge workers suffer from serious work-related stress. Surveys conducted by professional societies, e.g. The Danish Society of Engineers, show that work-related stress has become a serious problem for many engineers. The engineers claim that they are affected by heavy workloads and an increasing pace in work that result in classic symptoms of stress. On the other hand, the very same engineers regard their work as being privileged and stimulating. Due to the nature of their work, knowledge workers often have a high degree of influence on how their work is performed and structured. ‘Self-management’ is a predominant form of management when it comes to intellectual, creative, open-ended and complex work. Generally speaking, knowledge workers have the expertise, skills and (tacit) knowledge that are crucial for success. In addition, they are dedicated to – and often very enthusiastic about – their work. Given this background, it is often left to the knowledge workers themselves to determine their methods of work and to plan their work. Thus, knowledge workers will come out with a high score when it comes to influence and job control and should therefore – according to leading theories of work-related stress (e.g. Karasek & Theorell 1990) – not be stressed due to working conditions. On the contrary, knowledge work is typically characterized by a high decision latitude and classified as an active job. This apparent paradox suggests that we are in need of a new and more reflected perspective on job-related stress in order to understand the phenomenon. The limitations of traditional stress conceptions when it comes to understanding knowledge work have been argued elsewhere (e.g. Grönlund (2007), Sørensen et al. (2007), Buch & Andersen (2007)). In this paper, however, we will give an outline of a contextual framework of analysis that attempts to understand stress among knowledge workers in terms of a delicate blend of strain and enthusiasm. The discussion will be enlightened by empirical data derived from case studies of six Danish knowledge intensive firms. The interpretation of our empirical material will draw on insights derived from neo-institutional theory (mainly Scott 2008b). We will discuss three frameworks of sense-making that knowledge workers mobilize in order to alleviate stressing conditions in their work. However, in the concluding discussion we will question the frameworks’ ability to alleviate work-related stress. In fact, the frameworks are also a potential source of work-related stress when professionals are faced with demands for flexibility.

## Stress, strain and enthusiasm

The concepts of knowledge work and of stress are encumbered with ambiguity. Let us consider the concept of stress for a start. The concept of stress was introduced in the 1930’s by Hans Selye to characterize ‘the sum of all non-specifically induced changes in a biologic system’ (Selye 1956), but – through a chain of translations and mediations – “it [has become] a deeply held modern metaphor, an unquestioned explanation of the darker sides of human experience” (Viner 1999, 392). Indeed, “...[it] has now become a ‘rallying cry’ for proponents of modern concepts of disease as a controllable interaction between humans and their environment.” (op.cit. 405). Thus, at the same time deeply ambiguous and flexible to diverse interests and agendas, the concept has been closely associated with pathologies and diseases. Today the ‘battle’ of the concept of stress goes on. Thus, the major part of modern stress research is concerned with the development of models, criteria and definitions that specify stress as a specific and distinct reaction to environmental strains. However, it is not the ambition of this article to take part in the essentialist struggle over the concept of stress. Instead, we wish to entwine the chain of translations in order to investigate and uncover some of

the ambiguities inherent in the ‘phenomenon’ of stress. Early in the process of translations of Selye’s concept, the duality of stress and eustress was lost. We want to reintroduce and modify Selye’s initial dual conception of stress in order to reopen and investigate the phenomenon known as stress. This reintroduction can help to untangle our understandings from the pathological discourses that have become an integral part of stress research. Our ambition is to understand the ‘phenomenon’ of stress as a complex phenomenon that is constructed and reconstructed within work settings – not as a ‘phenomenon’ caused by external or internal ‘factors’. We chose to keep Selye’s initial conception of ‘strain’ as something external that affects a ‘system’, while we introduce ‘enthusiasm’ to refer to an emotional state. Thus, the pair of concepts is not seen as extremes on a scale or as dichotomies. They are derived intentionally from quite diverse theoretical backgrounds in order not to enforce premature reductions onto the phenomenon. It is crucial to allow for concepts that preserve the complexity of the context and reflect the understandings of the knowledge workers of our study.

Thus, the concept of strain is derived from Selye vocabulary and is conceived as external stimuli that affect humans. The concept of enthusiasm, on the other hand, is derived from theories of motivation with roots in humanistic psychology. An emotional state occurs when humans are fully engaged in and absorbed by a project or an assignment. The emotional state is characterized by feelings of arousal, well-being and joy (Tucker 1972). Traditional theories of motivation operate with a notion of ‘drive’ or forces that ‘move’ people (Ahl 2006). Some theories are preoccupied with rewards, but other theoretical variants install a fundamental strive to satisfy natural needs – in the end a striving for self-fulfilment. Du Gay (2008) draws our attention to the more religious connotations of enthusiasm. An enthusiast – in its Greek etymological origin – was a person possessed by a god. But nowadays the concept is mainly used in situations where people are fully engaged and absorbed in their assignments. The concepts of strain and enthusiasm are derived from diverse theoretical backgrounds, but they are widely used and they have influenced our mindset immensely. Thus, the concepts of strain and enthusiasm have become part of our folk psychological vocabulary, and we use the concepts in order to frame and understand our (un)comfortability with situations. As researchers, we do recognize, however, that the concepts are informed and over-determined by individualistic psychological presumptions (Ahl 2006, Hvid 2009). We do not share these presumptions, but we recognize, on the other hand, that they inform the understandings of the knowledge works of our study. Our empirical findings show that the knowledge workers often find the same types of situations both strenuous and enthusing, although not necessarily so. Strain, as an example, may be caused by frequent interruptions of work, but interruptions can also stimulate and enrich the knowledge workers by allowing for professional and personal input. It is this heterogeneity and complexity in knowledge work that attract our attention. We want to investigate the dynamics of the subjective and objective conditions of work related to stress. By sidestepping the over-theorized concept of stress and focusing on strain and enthusiasm among knowledge workers, we hope to shed some new light on the problem.

## The ambiguity of knowledge work

*“You don’t always have the feeling that your job is straight to the point. Actually, you can have your doubts: Say, did I get it right this time? If you’re working on something that’s part of somebody’s assignment. You’ve been given some vague constraints for the solution of the task and you get back with your output. And you don’t get any response on your work. You get kind of troubled. That’s how I feel and I think: Gee – did I get the perspective on the problem right? For example when I do risk assessments. Such things can be done within 1½ page. [But] it can easily stretch over 7 pages depending on how thoroughly you deal with the assignment. In situations like this I feel I’m in need of feedback – that’s what I think.”* (From an interview with Nina – an experienced engineer working in an engineering consultancy firm.)

Nina’s remarks remind us that engineering work and performance are susceptible to interpretations. Although knowledge work can in fact be regulated by the laws of nature, by rigorously audited quality standards and by strict company procedures, there is still considerable room for personal judgement. This interpretative flexibility and open-endedness have been argued strongly by theoretical and empirical studies

in science and technology. Bucchiarelli and Kuhn (in Barley & Orr 1997, 213) make the point in relation to engineering design when they write:

*“It is not difficult to lay out performance specifications at the beginning of the design process; indeed, it is standard practice. What is difficult – probably impossible – is retaining those specifications without an ongoing process of modification, clarification, negotiation and joint meaning-making. Specifications that seem clear at the outset are stretched and challenged by the design process itself; ambiguities, incompletenesses, and contradictions are uncovered as part of the process of discovery that is design.”*

And Karl Weick generalizes and exemplifies the same point when he writes:

*“In real-world practice, problems do not present themselves to the practitioners as givens. They must be constructed from the materials of problematic situations which are puzzling, troubling, and uncertain. In order to convert a problematic situation to a problem, a practitioner must do a certain kind of work. He must make sense of an uncertain situation that initially makes no sense. When professionals consider what road to build, for example, they deal usually with a complex and ill-defined situation in which geographic, topological, financial, economic, and political issues are all mixed up together. Once they have somehow decided what road to build and go on to consider how best to build it, they may have a problem they can solve by the application of available techniques, but when the road they have built leads unexpectedly to the destruction of a neighborhood, they may find themselves again in a situation of uncertainty.”* (Weick 1995, 9).

Thus, contrary to common-sense perceptions, there are no clear or predetermined standards for what makes engineering work – and other kinds of complex knowledge work – successful. The very successfulness (or unsuccessfulness) of the work is established in a complex work context, in which various goals, interests and perspectives are mediated, altered, mangled and negotiated. The work context is heterogeneously populated by various actors (the customer, the manager, the colleagues, etc.) and actants (quality systems, technical equipment, etc.) that give ‘voice’ to (conflicting) interpretations of what constitutes successful work. Although local routines, standards and conventions guide the day-to-day work and make ‘going on’ possible, these routines can be interrupted and questioned. The increasing complexity of knowledge work makes it likely that the work routines are in fact frequently interrupted. Restructurings, organizational changes, new managerial philosophies and techniques count among the more spectacular interruptions of everyday work routines, but local work routines may also be questioned by colleagues from other departments in the company, colleagues with other professional backgrounds, etc. All in all, knowledge work is inherently ambiguous. The work is characterized by a high level of ambiguity in input, process and output. Although knowledge work can be rooted in well-established bases of professional practice and knowledge (e.g. as in the case of traditional engineering knowledge about ‘how things work’ in the physics and instrumental processes), the work context of knowledge work is in fact highly unstable, ambiguous and subject to interpretation.

## Identity and stress

These characteristics of knowledge work seem to have implications for the way in which knowledge workers make sense of their work and their own identities. In a general theory of the psychological make-up of individuals, Giddens describes (Giddens 1991) how identity work has developed as a social, reflexive and subjective project in late modernity. Giddens uses the term ‘self-identity’ to describe the individual’s ongoing reflective attempts to make sense and coherence of its experiences and to stabilize the self. Normally the self is stabilized through unproblematic routine actions of the practical consciousness. These routine actions are fundamental to our ability to carry out ordinary social interactions and tasks, and they provide a basic cognitive and emotional platform for the development of the self – the ontological security of our existence. However:

*On the other side of what might appear to be quite trivial aspects of day-to-day actions and discourse, chaos lurks. And this chaos is not just disorganisation, but the loss of a sense of the very reality of things and of other persons. (Giddens 1991, 36)*

In other words, the individual continuously must engage in a sense-making endeavour in order to secure the ontological security of the identity. The continuous reproduction of the self-identity is needed in order not to lose sense of reality and face existential anxiety. The reflective construction of self-identity is based on social and cultural resources: language, symbols, meanings, values, etc. These elements are the fundamental bricks of identity work, and with these elements the individual constructs and stabilizes the identity. The identity work of knowledge workers is interwoven with their professional training and career background. With an academic training and a professional career in e.g. engineering, the individual typically identifies with the profession's values and adopts a certain way of seeing and approaching the world. Weick summarizes how self-identity and the framing of a situation or a perspective correspond:

*Depending on who I am, my definition of what is "out there" will also change. Whenever I define self, I define "it," but to define it is also to define self. Once I know who I am then I know what is out there. But the direction of causality flows just as often from the situation to a definition of self as it does the other way. And this is why the establishment and maintenance of identity is a core preoccupation in sensemaking and why we place it first on our list. (Weick, 1995, 20)*

Typically, the professional outlook will constitute the basis of the individual's appraisal of the work and lay out a horizon of expectations in relation to fulfilment, self-realization, job satisfaction, etc. In this way, the construction of self-identity becomes the yardstick for the individual's sensemaking and, a fortiori, for the individual's sense of strain or enthusiasm in relation to work. Work related stress is developed, as strains accumulate over a longer period of time. This might of course be due to heavy workloads and other stressors defined by traditional theories of work-related stress. However, in the case of many knowledge workers, it can also be caused by work-related conflicts, unfulfilled ambitions, professional intimidations, etc. – strains that put pressure on the professional self-identity and threaten the individual's ontological security. For knowledge workers, work will become stressful when their expectations and professional aspirations are not met. When the self-identity adopts a professional codex or ethos, it will be stressful to experience conflicts that intimidate or sidestep the values of the profession. It will be difficult for the professional identity to make sense of these violations. They will be perceived, not only as unreasonable actions, but also as a personal assault, degrading or senseless. The inherent ambiguity of knowledge work is a constant challenge for sense-making and the maintenance of self-identity.

## Strain and enthusiasm in knowledge work

The ambiguity involved in knowledge work becomes a potential strain on the identity construction of the employees engaged in knowledge work *and* a potential source of enthusiasm and self-fulfilment. Due to the incessant discussion and negotiation of their performances and roles, the engineers are constantly faced with doubts and insecurities about the relevance, use and meaning of their work; yet, these negotiations also hold the prospect of receiving acknowledgement of their importance in developing and executing special assignments. The knowledge workers constantly have to reflect on their contribution to and their entitlement in the organisations, in society in general, and not least in relation to personal expectations to career development and work life. The nature of their work requires them continuously (and often openly) to define and substantiate themselves. This makes their work a field of intense and ongoing identity construction and development. When the challenges of the job are successfully overcome, feelings of enthusiasm are evoked, but when they are not, the result may lead to anxiety, doubt, confusion and feelings of guilt and shame. Due to the ambiguous character of knowledge work, the identity development and construction of the knowledge workers are under pressure.

In a series of qualitative focus group interviews with knowledge workers and their managers in six Danish knowledge intensive firms, efforts have been made to map the enthusing and straining elements of knowledge work. At each company, four focus group interviews were conducted as ‘workshops’ with 6-10 participants. The participants were asked – collectively – to draw a mind map of the straining and enthusing elements of their work. Each workshop was completed in 2–3 hours. In construing the mind map, the participants were asked to explain and discuss why the elements of their work were conceived as either straining or enthusing. In what follows we have condensed some of the thematic discussions of the interviews.

One theme of the interviews deals with professionalism:

- The interviews point to the importance of professional development as a prerequisite for the feeling of enthusiasm. The knowledge workers stress that they thrive on opportunities to struggle with challenging assignments that give room to contemplate technical problems. One engineer sees technical contemplation as the “fuel” that keeps him going, and another one expresses his wish for room to do “nerdish” work. It is obvious that the term ‘nerd’ has a very positive meaning among the engineers and is closely associated with the engineering ethos.
- It is also very important for the knowledge workers to be recognized as accomplished and competent professionals by their colleagues, superiors, customers and fellow professionals.
- The knowledge workers do not take their professionalism for granted. On the contrary, professionalism is a thing that needs to be established and proven on a regularly basis. The striving towards personal fulfilment and development is tightly interwoven with a striving towards overcoming and solving technically challenging problems.

Another theme in the interviews addresses the need to produce ‘results’ or manifest products:

- Some knowledge workers consider it very important that their work actually adds value to someone or that the work actually results in the fabrication of a concrete (and tangible) product. One engineer tells a story about how proud he was to point to a bridge when driving on the freeway with his son and say: “Dad built that bridge”. Others make the point in other words: “I want my work to make a difference [to my fellow citizens].”
- The ambition to make a difference is closely related to the knowledge workers’ feeling of pride in their job and the product they produce. It is mandatory that the professionals can vouch for their products and that the quality of what they deliver is impeccable. If the knowledge workers are forced to deliver a service or a product half-done, they feel bad about the situation and feel that their professionalism is being compromised.

This last point about the quality of the products of their work is further developed in discussions about the fragmentation of their workdays.

- Working on several different assignments during a workday can be very stressful for the knowledge workers. They feel that their working hours become fragmented when they have to attend to many different assignments during the day. They feel the lack of continuity very unsatisfying because it deprives the knowledge workers of contemplating the more technical problems of their work – which eventually results in unacceptable quality standards.
- Even though the problems are solved on an acceptable basis according to the company’s quality standards, the knowledge workers often feel that the fragmented workday does not leave room to solve the problems in ways that are acceptable to their own professional standards of quality. In effect, the knowledge workers work longer hours in order to raise the quality level of the products – even though the budgets do not give room for this. Typically, the professionals take the extra time to deliver high quality and omit to invoice the extra time spent.

Finally, the knowledge workers are very concerned with questions about management and feedback.

- The professionals appreciate autonomy in their work. Self-management is the dominant form of management when it comes to giving shape and structure to the assignments and the working days. Allowing the professional judgements and individual preferences to structure work are seen as the most effective and satisfying way to get the job done – both managers and employees agree on this

point. However, the professionals often feel that the autonomy comes at a price. They often feel that they are left in a vacuum where they have to make decisions and perform without any clear guidelines. Nina's remarks – quoted earlier – exemplify this point. The professionals cry out for feedback – from colleagues, managers, customers, etc. The ambiguity of knowledge work calls for feedback to let the professionals know they are on the right track.

In summary, the enthusing elements identified in the interviews in all of the six Danish knowledge intensive firms concern:

- professionalism
- development prospects – professionally and personally
- delivering the results (achieving results)
- identification, pride and meaning
- autonomy
- recognition and feedback
- social support from colleagues
- clear framework and “good management”

The themes regarding elements in the work that produce strain decidedly mirror those listed as leading to enthusiasm. Thus, they address the following issues:

- too much work
- too diversified tasks
- interruptions
- not delivering results
- ambiguous demands, vague framework – “bad management”
- unpredictability/insecurity
- rivalry between colleagues

It is interesting per se to find out what precisely the professionals perceive as respectively enthusing and straining elements. But what is really striking in the findings are the complexities and ambivalences in knowledge work. It appears that elements that enthuse the knowledge workers – professionalism, developing products of high quality, autonomy, etc. – are the very same elements that cause strain in the work. This entails that the very elements that feed the employees' sense of enthusiasm in their work and provide them with fuel to go on, are the same that in the end tip them over the edge and become a strain. When the professional ambitions and values are compromised, their enthusiasm translates into strains and frustrations. It is another interesting point that many of the elements that lead to enthusiasm and strain in knowledge work are produced in the clash between the knowledge workers' subjective ambitions and professional aspirations on the one hand, and the objective reality of the organization on the other hand.

## **Stabilizing frameworks in knowledge work**

Various resources and frameworks of sense-making are available for the knowledge workers in their efforts to cope with conflicting demands, extreme complexity and heterogeneity. These frameworks deliver cultural resources, stories, metaphors, discursive material, etc., that can be applied in order for the individual to establish their subject positions within the dynamic field of the work place and substantiate their self-identity. W. Richard Scott, one of the founders of neo-institutional theory, argues that:

*“...the insight that professional authority is based on the ability to create and apply a set of cultural-cognitive, normative and/or regulatory elements that provide frameworks for dealing with various types of uncertainty is at the core of the institutional perspective. [...] In our own time, the professions are the primary societal institutional agents.”* (Scott 2008a, 227)

In accordance with this institutional perspective, professions can be seen as regimes of competence that give authority and legitimacy to activities, relations and resources. Scott identifies the elements of institutional hegemony in the rules, norms and beliefs of the professionals. Institutions – and professional hegemony – are comprised of three pillars (Scott 2008a; Scott 2008b cf. chap.3):

- the regulatory pillar, which stresses rule-setting, monitoring and sanctioning activities, both formal and informal;
- the normative pillar, which introduces a prescriptive, evaluative, and obligatory dimension into social life, stressing ‘appropriate’ behaviour – given the demands of the situation and the actor’s role within it – vs. ‘instrumental’ behaviour, in which attention is focused on the actor’s preference and pursuit of self-interest; and
- the cultural-cognitive pillar, which emphasizes the centrality of symbolic systems: the use of common schemes, frames and other shared symbolic representations that guide behaviour.

Thus, the three institutional pillars enhance and restrict behaviour by enforcing professional standards of compliance. The constitutive elements of the institutional pillars are summarized by Scott in the table below:

	<i>Regulative</i>	<i>Normative</i>	<i>Cultural-Cognitive</i>
<i>Basis of compliance</i>	Expedience	Social obligation	Taken-for-grantedness / Shared understanding
<i>Basis of order</i>	Regulative Rules	Binding expectations	Constitutive schema
<i>Mechanisms</i>	Coercive	Normative	Mimetic
<i>Logic</i>	Instrumentality	Appropriateness	Orthodoxy
<i>Indicators</i>	Rules Laws Sanctions	Certification Accreditation	Common beliefs Shared logics of action Isomorphism
<i>Affect</i>	Fear / Guilt / Innocence	Shame / Honour	Certainty / Confusion
<i>Basis of legitimacy</i>	Legally sanctioned	Morally governed	Comprehensible Recognizable Culturally supported

**Table 1 Three institutional pillars (Scott 2008b, 51)**

Scott’s analysis of professional authority establishes a framework that allows us to understand how knowledge workers use institutionally founded discourses, symbolic representations, routines, etc., in order to reduce contingency in their work and thereby stabilize their self-identities. The knowledge workers are engaged in a sense-making endeavour that reflexively substantiates their professional identities by aligning their actions and beliefs with the professional community. The professional identity of the individual is reflected in the historic and socio-cultural ethos of the profession. Thus, this professional ethos – the values, standards and ideals of the professional institution – provides the individual with guiding principles that set criteria for the (un)successfulness of their (professional) achievements. The professional institution provides resources for the production of self-identities and a point of reference in the continuous reproduction of identities. This helps the individuals to substantiate and stabilize their identities. On the other hand, however, identities can come under pressure when individuals are confronted with conflicting regimes of authority. In our studies we find examples where knowledge workers’ identities are confronted with conflicting regimes of authority. We see how engineers employed in engineering consultancy firms are put under considerable pressure when they try to honour the standards of their profession – e.g. rigour and meticulousness of their calculations, and professional accountability to their costumers and peers. The engineers are faced with conflicting demands of efficiency and swiftness. Confronted with corporate demands of economic and bureaucratic accountability, the engineers are often forced to compromise. Thus, they are put in situations

where they need to navigate between conflicting regimes of legitimacy. This can indeed be challenging, and prompts substantial identity work.

In what follows we will discuss three frameworks of identity construction in knowledge work. For short, we will call these frameworks: the professional framework, the bureaucratic framework, and the broader framework. These frameworks are constructed through our interpretations of our empirical material. Thus, they reflect the collective narratives of the interviewees, but in an elaborate and condensed way. It goes without saying that the narratives of the interviewees are highly complex and unique. It is not our ambition to reduce the complexity of these narratives by constructing explanatory models of identity construction as such. The frameworks should rather be viewed as analytic constructions that help us understand the dynamics of identity construction in the context of knowledge work. We recognize that identity construction is closely linked to ethnicity, gender, class, etc. However, our study has a much more limited focus on the construction of professional identities. We want to stress that the conceptual status of the frameworks are analytic. Thus, the frameworks are not intended as ‘explanatory devices’ or strictly representative categories. The frameworks should be seen as a product of our effort to capture some predominant thematic streams in our interviews on an institutional level. In what follows we expound these frameworks on a general level using material from our interviews and from relevant literature.

## **The framework of the profession**

Our interviews show that the knowledge workers draw heavily on a professional framework in their sense making. An architect working with design says in an interview:

*Architect: “I want to be passionate about my job. And I’m at my best when I’m passionate. It makes me efficient, swift, etc.”*

*Interviewer: “...and you can only feel passion when your professionalism and your skills are in play?”*

*Architect: “Yes. Maybe you could put it this way: It’s also a matter of integrity. That is, the stuff I produce should be as good as it can get. Not just because I think so, but because I’ve put some consideration into the matter. And if you can’t argue against it, but just say: It shouldn’t be like that! Well, then it’s right. If not, I might as well not bother.”*

The educational background as an architect, engineer, biologist, lawyer, etc., and the socialization that goes along with the study, give the knowledge worker a specific perspective on “reality”. Scott points out that the cognitive-cultural pillar regulates the actions of the knowledge workers by structuring their ideas and perceptions. E.g. medical doctors are in consensus about what constitutes clinical work, how doctors should behave in relation to their patients, etc. (Scott & Backman 1990). Knorr Cetina (1999) describes how professionals live in epistemic cultures that help them create and validate knowledge. The culture of the professionals specifies (although often tacitly) their basic presumptions about reality; the culture supplies the professionals with a language, concepts and root metaphors (Lakoff & Johnson 1980, 1999) that enable them to make specific and subtle distinctions; the culture specifies how problems should be framed, solved and what constitute problems; it specifies principles for valid reasoning, etc. Thus, the professional culture defines the content and the methods of the knowledge work.

For instance, a distinct epistemic culture exists in engineering. Engineers share a common cosmology. Bucchiarelli (1994) has described this cosmology as an ‘object world’. The object world is a domain of thoughts, actions and values that guide the work of the engineers and their way of seeing the world. In the cosmology of the object world, precision, decidability, rigour, unambiguousness, consistency, usefulness, determinism, rationality, mechanistic models, reductionism, value-freedom, results, achievements, etc., are all held in high esteem (see e.g. Layton (1986), Williams (2003), Kunda (2006)). Many of these ideals are inherited from the scientific worldview. The values are reproduced through basic education in engineering that stresses scientific methods and disciplines. The engineering ethos promotes scientific methods and principles that reduce complexity in unambiguous models.



Bucchiarelli and others have effectively shown that, although these schemas, ideas and standards are held in high esteem by the engineers themselves, they do in no way reflect engineering work as performed in real life. Engineering is immersed in social processes that do not live up to ideals of the object world. Ambiguity and social interests are part and parcel of engineering practice. Thus, a discrepancy exists between the espoused (idealized) cosmologies of the engineers and the actual principles that guide their day-to-day practice. The espoused framework is in a way archaic: it reflects a vision of engineering inherited from old ideals about the engineering profession that is in fact at odds with present-day engineering practice. The archaic professional framework, however, can give comfort and stability in the turbulent world of ambiguities. Belonging to a profession provides an opportunity to enter a frame of reference in which it is possible to understand oneself and one's work in terms of a number of conceptual schemas, codes and concepts of values. Life within the object world guards against ambivalence and anxiety. In this way, the profession – understood broadly as a particular 'mindset', internalized for instance through long university educations – may act as a critical reference point to the engineers, making it possible to keep informed and find one's bearings in the complexity; especially when the identity is under pressure. At the same time, however, it is clear that this identification, emphasizing the cultural and cognitive standards of the engineering profession, may fall short when it encounters the aims and frameworks of the work that exist in the organization. The archaic 'mindset' of the engineering culture can turn out to be an absolute impediment. Far from dealing with the ambiguities involved in engineering work, clinging to the archaic professional framework is close to a state of denial: the troublesome complexity of the work is shunned and seen instead in terms of the object world. This state of denial is of course counterproductive in the long term. The archaic professional framework of sense-making within engineering culture shows when large numbers of engineers voice their concerns about the restricting nature of their jobs. They view themselves as 'atypical' engineers, because they are not doing 'engineering in its proper sense' (Christensen & Buch 1999, Buch 2002). This tendency to project idealized and archaic conceptions of engineering work as standards for their professional identities doubles the ambiguity of their situation. In the first place, the heterogeneous character of their work does not provide fixed criteria or standards to direct actions. Secondly, the archaic professional self-image offers idealized standards that cannot be met in the quotidian lives of the engineers. Thus, in the case of engineers, adopting the professional framework as a sense-making framework may alleviate anxiety and strain, but in fact it can also be counterproductive: upholding strict professional engineering standards in a highly complex and heterogeneous work environment may put considerable strain on the self-identity.

## The framework of bureaucracy

Knowledge work is commonly conceptualised as creative, dynamic and innovative. The complexity of knowledge work and the demand for esoteric expertise do not easily allow for standardization and routines. Thus, knowledge work is often set in harsh contrast to bureaucratic work. Kärreman et al. (2002, 73) describe this widely held perception in the table below:

Key aspects	<i>Bureaucratic ideal type</i>	<i>Knowledge-intensive firm</i>
Mode of production	Standardization	Ad hoc problem solving
Dominant control logic	Enforcement of rules	Negotiated order
Environmental contingencies providing relative advantage	Stable, anticipated change	Turbulent, disruptive change
Nature of product and services	Homogenous	Ambiguous
Leveraging capital	Financial	Intellectual
Locus of power	Manager	Professional

**Table 2 Knowledge intensive firms and the bureaucratic ideal type. A comparison. Kärreman, et al. 2002, 73**

It is correct that knowledge work is known by its high complexity, but nevertheless, the degree of complexity in knowledge work has variations. Davenport (2005) makes this point. Knowledge work spans from highly

complex and experientially based work that requires expert judgements and (tacit) knowledge (e.g. primary care physicians) to more systematic and repetitive work that relies on formal processes, scripts, methodologies and explicit standards (e.g. engineers working with computer codes). Thus, Davenport does not see bureaucracy as antithetical to knowledge work. Bureaucracy should rather be seen as an integral element in knowledge work that may have more or less weight in guiding work. Kärreman et al. connect with this observation. Their studies of work processes in knowledge intensive firms in the biomedical industry and in consultancy show that work, decision-making and collaboration are highly regulated through rules, scripts, and bureaucratic procedures. Thus, bureaucracy is not antithetical to knowledge work. In fact, Kärreman et al. document that bureaucratic procedures can play a dominant role in structuring knowledge work. But how does bureaucratization of work affect the knowledge workers? Does bureaucracy inhibit the knowledge workers and inflict strain? It would seem so. In a conventional perspective, knowledge work is seen as autonomous – entirely regulated by cognitive, moral and cultural standards prevalent in the profession. Thus, bureaucratic regulations are likely to be classified as straining. Our interviews show that many knowledge workers share this view. They describe bureaucracy as expedient, imposed on their work as a foreign element, counterproductive and something that is likely to obstruct their work. They associate bureaucracy with situations in which their expertise is overruled by arbitrary rules and criteria. In these situations, their professional status and integrity are offended and their professional identities are under siege.

This line of reasoning is echoed in many observations (e.g. Broadbent et al. 1997) and it runs as a theme in our interviews. It can be illustrated through a statement made by a knowledge worker employed as a civil servant. She prepares the agendas and proposals for the board of a Danish municipality:

*“And there you are. You have put all your efforts in preparing the proposal and it is ready just in time. Finishing the proposal would normally take one week of preparations – but you have done it in just one day – and night! And you can answer for this proposal in all respects. Then they just mention that some commas are missing. This really frustrates you!”*

This frustration is a result of the lack of appreciation of her work. Her work is not evaluated on professional terms, but judged in accordance with an arbitrary and insignificant standard (comma faults). These formal standards of spelling do not bear significantly on the professional system of legitimacy and thus are seen as irrelevant markers for doing a good job.

Knowledge workers have a tendency to demonize bureaucracy. However, bureaucracy in knowledge work is not entirely negative, although it is often portrayed in this way. Kärreman et al. (2002, 79) point out that bureaucracy may in fact alleviate strain and stabilize professional identities by supplying standards in ambiguous work:

*“The bureaucratic modes of operation at Beta are, of course, always present, even in team interaction. However, they operate more as a supporting structure than as a controlling and regulating structure. Bureaucratic procedure appears to be more like a vehicle of shared understanding than a protocol for prescribed behaviour. In this sense, bureaucracy at Beta appears to be a cultural phenomenon: an expression of a particular collective mindset and frame of reference.”*

Thus, bureaucracy can be seen as a mode of governance that helps to handle complexity and ambiguity at work. Bureaucracy in knowledge work cannot eliminate ambiguity entirely – if it did, it would hardly qualify as knowledge work any longer. But a selective bureaucratization of knowledge work may provide guidelines and standards. Bureaucracy can provide a common frame of reference for the knowledge workers by establishing a repertoire of procedures that can either ‘take over’ negotiations and structure collaboration and interaction, or function as enabling material that may bring closure to ongoing negotiations – thus reducing complexity. In this sense, bureaucracy can be seen as a standardization and ‘short hand’ for more tedious, repetitive local negotiations of competence.

To obtain this positive effect, it is crucial that the selective bureaucratization of work does not violate or in any way get in conflict with the cognitive and cultural codex of the knowledge workers. Bureaucracy is felt straining if it invades certain domains of work and certain areas of professional expertise and judgement. On the other hand, bureaucracy is embraced by the knowledge workers if it does not compromise their professionalism. Adler and Borys (1996) make a distinction between affording and restraining bureaucracies. However, they construe this distinction in a functionalist way, in which affording bureaucracies are defined as procedures that help the professionals to meet the needs of their clients, and controlling bureaucracies are understood as systems of control introduced as a substitute for professional commitment. When we discuss the potential tension between professionalism and bureaucracy, we try to understand this tension in relation to the professionals' continuous project of identity construction. The introduction of new bureaucratic regulations of work is perceived as affording or controlling – as enthusing or straining – according to the knowledge workers' subjective and inter-subjective interpretations of professionalism and their position in the work process. Thus, it is not possible a priori to establish a demarcation between affording and controlling bureaucracies.

### **Broader frameworks of sense-making.**

It is not surprising that professionalism plays a central role in the identity production of the knowledge workers. Similarly, it is no surprise that local regulations of work have an impact on the knowledge workers' feelings of enthusiasm and strain. The institutional conditions and systems of legitimacy in knowledge work are closely related to the professional ethos and to the local and situated regulations of work in the company. However, the sense-making process is not confined to the professional ethos and the local regulation of work alone. Broader normative institutional formations of social obligation and moral duty are also active. The knowledge workers' sense-making reflections thus appeal to values and ideals that are widely accepted within our society. This is reflected in an interview with a lawyer employed in a trade union:

*“What makes this job worthwhile and motivating is to help people that are totally...well, people who were given the sack. Their situation is distressful when they get in contact with us, and then a few minutes later...we have created a new reality! And this is a tremendous satisfaction. You make change. [...] You really feel that you make a difference. In this way the job is very satisfying.”*

The knowledge workers frequently refer to the effects and consequences of their work. They attach much importance to the fact that their work ‘makes a difference to someone’ or that their work ‘contributes to (lasting) results’. The quoted lawyer makes it clear that he takes a lot of (professional) pride in helping people manage their difficult situations. Thus, the fact that his efforts are appreciated by the union members he helps contributes significantly in his sense-making endeavour. In our interviews, we heard many engineers, biologists and geologists refer to sustainability: they described their work as environmental work. They have adopted the widespread normative discourse of sustainability to legitimise and substantiate work as meaningful.

A similar, though in part different, strategy of normative legitimisation is found in engineers who take pride in their achievements. Thus, an engineer tells us that he took great pride in telling his son that he had built a major bridge that connects islands in Denmark. The bridge comes to symbolize manifestly an undisputable ‘result’ that – due to its sheer physical presence and materiality – legitimises the work. This normative legitimisation holds – of course – an implicit premise that a bridge is useful to many people, but the corporeal element of the ‘result’ also helps the knowledge worker to make sense of his abstract and intangible work. The functionality and lasting character of the bridge (‘it will be there when I’m gone’) becomes a proof of successful work.

A third – and yet again slightly different – example of normative legitimization of work is found when interviewees stress the importance of achieving economic results. Knowledge workers in engineering consultancy firms or in advertising are enthused by securing an order or in other ways boosting the economic

results of the company. They take pride in being a member of 'a winning team'. These examples show that the knowledge workers' sense-making activities find resources in normative frameworks that transcend the strict professional or bureaucratic systems of legitimacy. Resources from broader moral, social or political frameworks (social responsibility, sustainability, etc.) are evoked as guiding principles in the sense-making processes along with resources from the professional and bureaucratic framework.

## Conclusion

We have shown how knowledge workers draw on different frameworks in their identity work and sense-making endeavours. These frameworks are identified as a cognitive-cultural framework of professionalism, a regulative framework of bureaucratic rules and procedures, and a normative framework regulated by moral values and ideals rooted in broader societal contexts. We have seen that adhering to these frameworks of sense-making could stabilize the self-identities of the knowledge workers. The frameworks provide opportunities for ambiguity reduction: the frameworks can provide structure, security and certainty in the complexities of knowledge work. However, the frameworks may also jeopardize sense-making processes. The certainty provided by the professional framework can easily be transformed into professional dogmatism, bureaucracies can produce alienation and inhibition, and blind adherence to normative ideals can result in fanaticism. It is convenient to evoke explicit bureaucratic standards in order to justify your work efforts (Kärreman et al. 2002), and you can find reassurance in professional standards. But the comfort of complexity reduction afforded by the frameworks comes at a price: the knowledge workers can easily end up in a mental cage of professionalism, an iron cage of bureaucracy, or an ideological cage. The frameworks are effective vehicles of complexity reduction and sense-making, but are at the same time potential sources of strain infliction when the knowledge workers are faced with demands of flexibility, change, etc. If the frameworks cannot accommodate these demands, it might result in feelings of identity loss, insecurity and anxiety. In our effort to sidestep the individualistic and psychological concept of stress, and recast the problem in terms of strain and enthusiasm, we have made a re-conceptualisation and reconstruction that allow us to investigate the problem in terms of a dynamic framework of social institutions.

It is important to recast the problem in order to find new and constructive ways to deal with the destructive dimensions of knowledge work. The vocabulary of stress and the working environment need to be transformed in order to capacitate the new dimensions of knowledge work. An overwhelming part of the traditional stress literature tends to individualize and compartmentalize stress problems in an ongoing ambition to find and eliminate 'factors' of stress. Likewise, traditional thinking within the Scandinavian tradition of healthy work environments focus on shielding workers from unhealthy stimuli from the outer environment, e.g. by specifying limits for exposures. However, the problems with work-related stress, burnout and straining environments in knowledge work take on a different character that is not easily captured within the vocabulary of the traditional discourse on stress. Our research shows that the elements perceived as straining by one person can turn out to be the source of enthusiasm for another person. Some individuals thrive by handling demanding assignments in ill-defined work-settings, while others do not. High decision latitude can compensate for increases in job demands in some cases (Karasek & Theorell 1979). But for many knowledge workers, 'self-management' is not unequivocally an antidote for straining job demands; it can in fact be part of the problem (Sørensen et al. 2007). Thus, trying to reduce stress through the regulation of the work environment by specifying limits of exposure is deemed to fail. The same types of conditions can be perceived as straining or enthusing, depending on the situation, the framing of the situation, etc. Secondly, our research shows that the knowledge workers take an active role in producing and reproducing a straining work environment via the institutional frameworks that guide their work (the professional standards). Thus, the knowledge workers co-construct some of the straining elements in their work through upholding institutional frameworks. The traditional stress discourse is unable to get to grips with these reflective dimensions in knowledge work.

Thus, we propose to frame the problem in new ways. Using the concepts of strain, enthusiasm and institutions as vehicles, we have tried to re-describe the situation of knowledge workers in a new vocabulary.

This new vocabulary frames the problems as relational – not individual; it describes and analyses the problems as phenomena best understood in relation to their institutional mechanisms of (re)production – not as problems rooted in individual preferences or personal constitutions. We recognize that knowledge work is inherently ambiguous and that contingency is eminent. This ambiguity cannot be eliminated once and for all, and it is an open question whether ‘unambiguous’ work is the solution to the problems of the knowledge workers. We do not think so. We think the proper way to proceed in this matter is to find new collective and local ways to regulate and manage the straining and enthusing elements of knowledge work. Secondly, we do not believe in universal and acontextual models or ‘solutions’ to the problems. Thirdly, and most significantly, the knowledge workers themselves must take an active role in finding solutions to improve their working conditions. Stress, strain and enthusiasm in knowledge work are produced and transmitted through institutional frameworks. The only way in which institutions may change is when practice changes. Thus, the knowledge workers’ collective ‘doings’, routines, relations, connections, understandings, aspirations, etc., must be transformed by themselves. These transformational processes can be facilitated, but not designed, by consultants, managers and others who are not at the centre of the institutional practice. In this respect, it is crucial that the knowledge workers get the opportunity to take part in collective processes of reflection about their working conditions. Self-management has almost become a synonym for knowledge work. But it takes collective reflections to point out the ‘consequences’ of self-management in relation to well-being and collaboration.

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