

## Chapter 2

# **CULTURAL, SITUATIONAL AND INDIVIDUAL GENESES OF WORK LIFE**

Work forms the bedrock of all economic systems. When the nature and social organisation of work change, so does the fabric of society. (Barley and Orr, 1997: 1)

To understand the requirements for work and work life, their transforming character and the factors that shape their manifestation and transformation in a particular workplace setting, it is important to understand the historical and cultural genesis of the knowledge required for work and the situational factors that shape the enactment and transformation of work, and also how individuals construe and construct that knowledge. The knowledge required for work and working life arises from the practices and services that are required by cultures (i.e. particular countries) to meet their needs. It has developed over time, and therefore has historical bases. As cultural needs change so do the requirements for work. The changing requirements lead to particular kinds of work becoming more or less available with the means of engaging in work also changing, as are the kinds of people who are working. All this leads to work requirements—the capacities required for work—that are inherently dynamic. Yet, it is only in their enactment in a particular workplace that these requirements are manifest in practice and can be understood.

So, what counts as work requirements in particular workplace settings is likely to be both dynamic and highly situational. However, beyond socially objective views of work and issues associated with what counts as competence for the individual, there is a need to consider more personally subjective accounts of what constitutes work and working life for those engaged in it. That is, there is also a personal dimension to these conceptions. This chapter sets out to elaborate the historical, cultural and

situational origins of the requirements for work and their transformations. They are discussed, with consideration to the role of individuals in that process, in order to more fully understand changing work and work requirements from the subjective perspective of individuals and more objective accounts of work.

## **1. CULTURAL AND SITUATIONAL GENESES OF WORK KNOWLEDGE**

In considering how best to understand the requirements for work and work life in particular occupations and how they change over time, there is a need to account for and elaborate the historical, cultural and situational geneeses of the knowledge required for vocational practice at the occupational, situational and individual level. This is because the knowledge required for performance in work reflects a historically derived cultural need that is generative of occupational requirements and their transformation over time. Yet, although shaped by cultural need, judgments about requirements for work performance are situated in particular workplaces and work settings. These represent their manifestation of the vocational practice as shaped by localised factors and constraints. This situational perspective becomes prominent because the actual requirements for work and their change over time are socially and culturally situated (Resnick, Säljö, Pontecorvo and Burge, 1997). So, beyond cultural and historical development there will be particular sets of localised social factors that shape the requirements for work performance and their transformation: how they are both enacted and remade.

### **1.1 Socio-historic genesis of work knowledge**

To understand the nature of work and performance at work it is necessary to account for the historical and sociocultural practices that have led to the need for culturally distinct activities (Scribner, 1985b), referred to here as vocations or occupations. How people learn the kinds of knowledge required to perform occupations is culturally shaped since beyond involuntary behaviours, higher order capacities required for work are socially shaped (Vygotsky, 1987; Wertsch, 1991). In particular, the Vygotskian view holds that higher orders of knowledge are culturally sourced, rather than a product of individual biological determination or highly individualistic constructivism. Because of their origins, securing these forms of knowledge is likely to require interactions with social partners and sources (e.g. language, tools and artefacts). Consequently, the social basis for vocational knowledge is

central to understanding the requirements of work and working life as it: (i) informs how the practice itself is shaped by social factors; (ii) its requirements for performance; and (iii) the means by which individuals are likely to learn the knowledge required to perform at work. The sociocultural constructivist approach provides a way of understanding the complex of historical, cultural and situational factors that shape work life, its geneses and means of transformation. It is explained as follows.

The basic tenet of the sociocultural approach to mind is that human mental functioning is inherently situated in social interactional, cultural, institutional and historical contexts. Such a tenet contrasts with approaches that assume implicitly or explicitly, that it is possible to examine mental processes such as thinking or memory independently of the sociocultural setting in which individuals and groups function. (Wertsch, 1991: 85)

In this way, a sociocultural constructivist approach emphasises the need to engage and interact with social sources of knowledge that comprise the social gift of work and individuals engagement in and learning of it.

## **2. SOURCES OF CHANGES TO WORK LIFE REQUIREMENTS**

Sociocultural constructivist theory proposes that the activities individuals engage in have historical and cultural geneses. Four lines of development are advanced within this theory (Cole, 1998; Rogoff, 1990; Scribner, 1985b): (i) phylogenetic—the evolving history of the human species; (ii) sociocultural—development that reflects a particular cultural need; (iii) microgenetic—the moment-through-moment learning occurring as individuals engage with the social world; and (iv) ontogeneses—the development of individuals' knowledge throughout their life histories (Scribner, 1985b). These have been augmented by including in this scheme the situated level of practice—its genesis (Billett, 1998, 2001b), manifestation of cultural practice (Suchman, 1997a) and contributions to learning (Engeström and Middleton, 1996; Goodnow, 1996; Lave, 1993; Rogoff, 1995). Together, these five lines of development offer bases for appraising how competence in working life is constituted and enacted in practice and learnt. In other words, how the requirements for work are formulated, constituted, remade and transformed. Figure 2.1 depicts relations between these lines of development. It positions the phylogenetic level as being supra-cultural: across cultures. At the next level, sociocultural development reflects the particular

practices (e.g., tools, norms and processes as manifested by that practice) required to meet cultural needs. However, these requirements are manifested in a particular work practice, comprising a particular complex of situational factors. It is at this level, that individuals negotiate meaning and remake practice. For the individual, this is the source of their ongoing ontogenetic development.

## **2.1 Phylogenetic level of development**

The knowledge required for work is one part of the evolving and cumulative efforts of humans to know and act. The phylogenetic level of development represents the accumulated and evolving knowledge and practices of human development: the development of the species (which Vygotsky and Baldwin aimed to transform from a biological to social concept (Valsiner, 1998)). The accumulation of knowledge at the phylogenetic level likely has applicability across a range of cultural activities. For instance, the human need for communicating has led to the purposes and practice of literacy, as has the need for calculations led to mathematics, which are applied in different ways across cultures.

Cultures require and employ oral and written communication forms, including rules for organising language and writing. This is because these concepts and practices have to be enacted to achieve a manifestation. Yet this enactment is shaped in particular ways by factors that influence their enactment at that particular point in time and place. For instance, the culture and genre of the particular focus of communication serve to shape and constrain the particular form of language use and its rules for practice. Equally, calculations while containing universal processes (i.e. adding, subtraction, multiplication, division) are shaped by the purposes and forms. The requirement for a vocational practice such as caring for the health of others arise historically and might include the heuristics of diagnosing a condition before responding with treatment, or the evolving concept of hygienic practice being economical for all health care practices. However, while contributing to how work will be conducted through the development and carriage of particular sets of practices, goals and values, these need to be understood within the context of particular cultural practices that constitute the occupations individuals engage in and where these evolving concepts and practices are manifested.

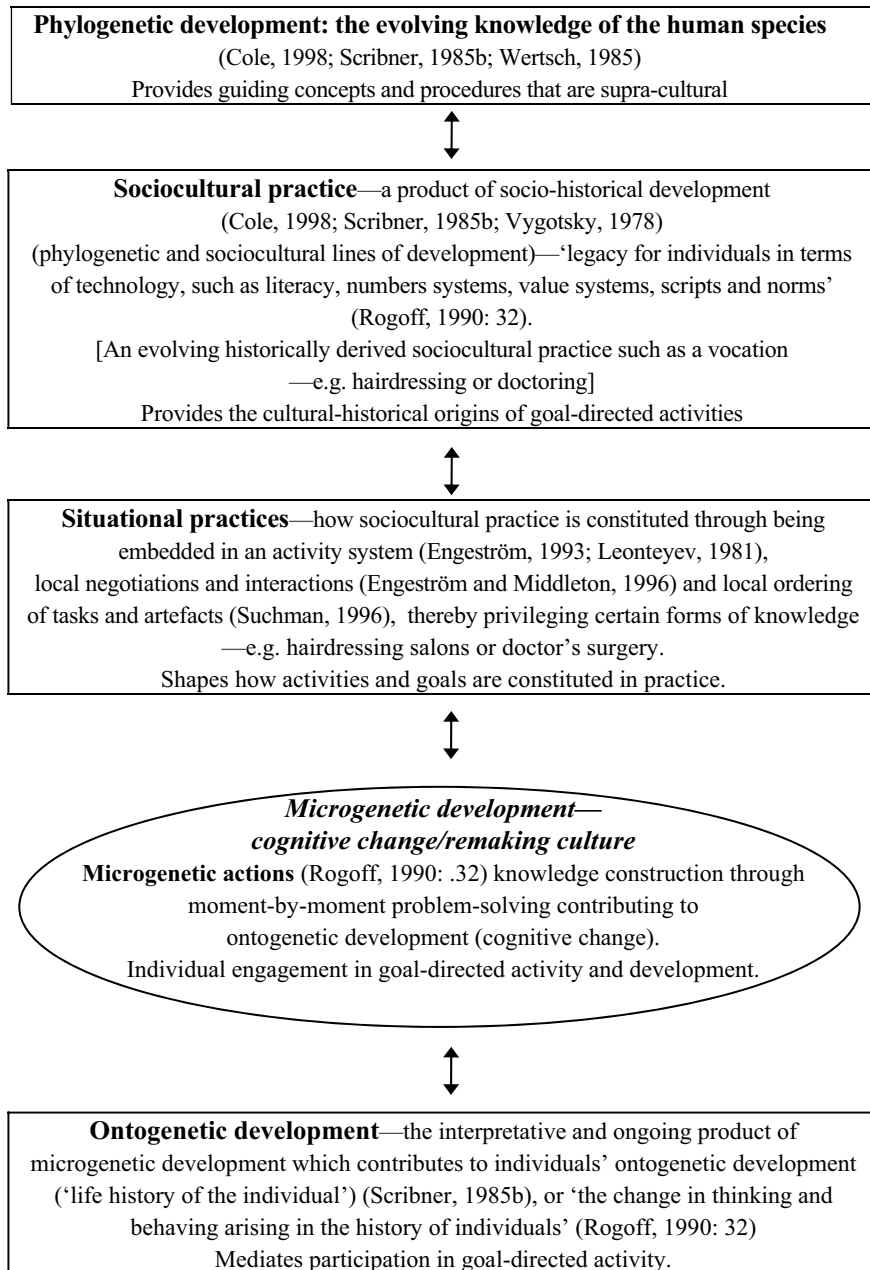


Figure 2-1. The sociogeneses and remaking of vocational practice

## 2.2 Sociocultural practice

Sociocultural practices, for instance occupations, are generated and re-made over time in response to particular sets of cultural needs and their transformation (Scribner, 1985b). They comprise practices, values, technologies and norms, (such as those required for work), and elaborate the enabling qualities of the historically derived phylogenetic knowledge within a particular culture or society's practice. So, the requirements for written and spoken language are manifested in different ways in different cultural milieu. Occupations, paid or unpaid, represent instances of sociocultural practice (e.g. teaching, nursing, hairdressing, motor mechanics etc.) that transform over time, as cultural needs and technologies change. There is a need for individuals to teach others, to nurse sick or aged people, to cut and style our hair and to manufacture, repair and maintain planes, ships, trains and motor vehicles. These requirements exist because there is a culturally derived need for them. They also stand as both the product of and subject to culturally shared expectations, such as teachers being able to develop students' capacities, and identify their individual strength and weaknesses. As with doctors and nurses, there are also culturally derived expectations of teachers, such as confidentiality, fairness and acting in students' (or patients') interests. Such expectations are inseparable from the cultural context in which they are generated (Scribner, 1985a). For instance, the occupation of hairdressing represents different culturally and historically derived sets of needs and premises from barbering, including the gendering of these roles.

There are also likely to be diverse culturally derived versions of hairdressing practice in Chinatown, a trendy inner city salon or a Rastafarian salon, as indeed there are of barbering (Billett, 2003b), which arise from different kinds of cultural imperatives. These versions of cultural practice warrant distinct concepts, practices and techniques, to address particular cultural needs. So what constitutes sociocultural practices (e.g. doctoring, cooking, nursing, hairdressing) can represent particular, yet diverse cultural needs (e.g. styles of cooking and hairdressing) albeit within the same cultural context (e.g. country or city) as imperatives of the cultural requirement. Just as cultural norms and values have led to the establishment of distinct occupations for men's and women's hairdressing, so too are there distinct kinds of hairdressing that arise from different needs within the community. Taking this example a step further, as the population of a particular community changes it is easy to understand how the requirements for paid work change (see Chapter 5). For instance, as younger men begin to frequent hairdressing salons for treatments that are not provided in barbershops, there may well be a decline in the number of barbering jobs. However, this trend might be reversed if hairstyles change back to shorter and simpler styles that

can be performed through barbering. Similarly, as a growing number of individuals in the community want particular or diverse kinds of food, the scope of food preparation and the skills required for preparing food might change, leading to a demand for some skills and a decline in others.

Consequently, the sociocultural level of development provides an important basis for considering the dynamic requirements for work and work practice, perhaps most commonly understood as an occupation. What actually constitutes the requirement for an occupation within a particular country, for instance, is used for the regulation of practice and learning of that occupation. The requirements to be a teacher, electrician, doctor, or nurse are codified and need to be met by novices before they are permitted to practice independently. The level of codification is likely to be premised upon factors associated with the risks to the community associated with its conduct. So, some forms of work are required to be certified (e.g. electricians, pilots, doctors and nurses) whereas some other occupations are not.

Moreover, it is these requirements generated at this sociocultural level (e.g. within a country) that are used to organise and regulate the access to and learning of an occupation. For instance, surveys of the skills required for occupations are gathered to produce standards and curriculum for the preparation of these occupations. Some occupations are seen as having higher or lower status in the community; with their standing being shaped by community values and norms. These socially constructed measures of status will likely differ across cultures and in different ways at different times (see also Chapter Eight). For instance, doctors' work is seen to be high status in most communities. In some cultures, the work of dentists is seen as being of lower status than doctors. Yet, even within a category of occupations, skilled workers such as trades people (e.g. carpenters, plumbers, builders, steelworkers, hairdressers) enjoy different status across and within countries. For instance, in the countries in northern Europe (Germany, Switzerland, Austria) some trade work is held in higher esteem probably than in countries such as Britain and Australia. Yet, there are also likely to be differences in the standing of trades work with a hierarchy based more on a cultural valuing than an objective assessment of relative skills. For instance, electricians and plumbers are often seen as high status trades, while hairdressing and barbering are seen to have lower status in some countries, yet may be valued by some young people in the community (e.g. the numbers of young women who want to be hairdressers).

Then, there are strong and enduring societal and cultural sentiments that prefer office-based occupations to those that have a connotation of manual work. So, the distinction between 'white-collar' (i.e. clerical, administrative and managerial) and 'blue-collar' (i.e. manual, trade) work emphasizes the

erroneous, but popular distinction between mental and manual work. For instance, Cho and Apple (1998) report how the government in Korea attempted to encourage more young people to work in manufacturing because of difficulties in securing an adequate workforce. However, manufacturing work was seen as unfashionable by many young people and undesirable by many parents and teachers. Their study reports how government efforts to increase the labour force for manufacturing were stifled by the actions of parents and teachers. So, while some young Koreans followed the advice of parents and teachers and sought clerical work, some elected to engage in manufacturing work, but for personal goals such as earning sufficient funds to travel overseas.

Thus, the sociocultural level of development articulates a need for a particular occupation, its standing and critical requirements within a particular cultural context, yet is subject to factors that shape their standing and transformation. The means for this cultural need to be enacted are supported by concepts and practices that have evolved over time through practice and are often quite robust because there have been tested and refined through practice over time. Yet, this level of development, because it expresses cultural needs and requirements, is subject to change as technologies transform and the requirements for securing occupational goals are modified. It represents a dynamic form of practice that has particular meaning within a culture, community or nation.

However, while informing about particular values, practices and expectations, the sociocultural level remains disembedded from actual practice within a workplace. Ultimately, although shaped by cultural need, practices and norms, situational factors shape how a culturally-derived occupational practice is constituted and enacted in particular work contexts (Billett, 2001b), as are the performance requirements (see Chapter 8). Each workplace represents a unique instance of a vocational practice that is a product of historical development and changing cultural need yet is constituted by a particular and transforming set of situational factors. These permit the manifestation of practice in a particular workplace's setting.

### **2.3 Situational factors**

Given the array of factors that shape its enactment (e.g. individuals, division of labour, clients, location, layout etc) it is not surprising that a hairdressing practice in a particular salon at a particular point in time is in some ways a unique instance of culturally-derived occupational practice shaped by situational factors (Billett, 2001b). In an investigation of work activities in four hairdressing salons, the goals for and bases of participation in hairdressing work were determined by factors comprising the internal



press of the workplace and external demands of the client community (Billett, 2003b). In each salon, the goals for hairdressing had distinctive features. Given the same set of hairdressing problems to resolve, hairdressers in each salon fashioned responses that had consistency across and within the salons, yet with some significant individual variations. Therefore, some components of the responses were consonant with the goals and norms of the sociocultural practice (i.e. the historically derived practices of hairdressing), while others were products of the particular salons (i.e. situational manifestations of practice—‘what we do here is’) or some idiosyncrasies arising from the hairdressers’ personal histories or ontogenies.

Observations revealed the diverse characteristics of what comprised the performance requirements for vocational practice in each salon. In a fashionable inner city salon, the key goals for performance were to transform the client’s appearance, and to offer new cuts and colours. The interactions with clients in this salon were a product of the types of clientele and the interests and values (lifestyle) of the hairdressers. In a salon in a low socio-economic suburb, the requirements for performance were to manage a precarious business with an absent owner, two part-time senior hairdressers and a clientele that included those who demanded complex treatments, yet did not subsequently care for their hair. A key requirement was to manage these ‘awkward’ customers when they returned complaining vociferously and forcefully about their treatments. In another salon, the clientele comprised elderly women who came for companionship as much as for hair treatments. Here, the hairdressers’ knowledge of clients’ personal histories, knowing the names and circumstances of family and friends, was an important component of practice. The fourth salon was in a provincial town in a rural region that was enduring a three-year drought. The goals here included providing good value to maintain the clientele and managing the difficult balance between eliciting additional service (colours and perms) yet not causing clients to choose between the cost of a hair treatment and groceries for home.

The factors that constitute the work practice within each of the salons were identifiable by and may be explained through their activity systems (Leonteyev, 1987; Engeström, 1993) that include the division of labour, rules and norms, relationships with the client community and degree of internal cohesion. Each site had particular goals associated with the division of labour. For example, one salon had a division of labour based around the principle that hairdressers should engage in tasks whose complexity was most consistent with their level of skills, as the hairdressers became available on completing a work task. This was part of the particular work practice insisted upon by the owner-manager and resulted in clients frequently being attended to by a posse of different hairdressers during a

treatment. In this hairdressing salon, there was a need for each hairdresser to monitor the progress and requirements of all of the clients in the salon, and work collaboratively with the other hairdressers. While at the salon in the low socio-economic suburb, disagreements among the staff about their conception of hairdressing were subordinated by common concerns about the 'awkward' clients and security of employment.

Indeed, how these common views were negotiated also differed across the social practices. For example, in the trendy salon there were common values about hairdressing that were different from the almost familial atmosphere of another salon, which had its own distinctive mores and values. In a third, there was a rigid form of internal press associated with the authority and presence of the owner-manager. For instance, the hairdressers operated under the owner's rule of 'no-yappers'—the hairdressing was to proceed in silence unless clients initiated conversations. The hairdressers in this salon, the one in which hairdressers frequently swapped in dealing with clients, developed a set of signals by which they communicated non-verbally. These mores led to particular work strategies being developed and practised in this salon, some primarily associated with responding to the idiosyncratic demands of the owner. The work in this salon progressed in comparative silence compared with the exchanges that occurred in the other salons and were almost in contradiction to the hairdressers' work requirements in the salon that catered to elderly women. In these ways, local negotiations (Suchman, 1996) determined the goals for and practices of the particular workplace (see also Chapter 8).

Similar situation-specific notions of practice requirements were observable in open-cut coalmines (Billett, 1994). Even across mines owned by the same company, some of them on adjacent leases, there were different requirements for performance. These were premised on the history of ownership, different demarcations of work, historically entrenched work practices, the mine's age and the mine's location in the coal-bearing basin. Consequently, conceptions of expert performance are not uniform across workplaces, with the differences being accounted for by the activity systems of the communities of work practice.

But more than stipulating the requirements for work, the workplace norms and practices also shape the workplace's participatory practices: that is what and how individuals are invited to participate in and how they elect to engage (Billett, 2002a; Billett et al., 2004). The work practice in each hairdressing salon afforded quite different access to novices and experienced hairdressers alike and made different demands, with different consequences, for what they learnt. One variable was size. In smaller salons, the apprentices had responsibility for a wider range of activities earlier than in the larger ones. Another was the culture of practice (Brown, Collins and Duguid,

1989), manifested as the division of labour. In the trendy salon, each hairdresser worked on their own clients from greeting them at the door to getting them coffee, washing their hair, negotiating with them about and styling their hair. So it was incumbent on the apprentice in this salon to take sole responsibility for clients as soon as possible. In another salon, key work tasks were divided among the hairdressers, and the apprentices were more focused on support and preparatory activities until their final year. There was also a privileging of particular knowledge amongst settings (Goodnow, 1990), some of which remained the sole domain of principal participants. For example, two owner-managers maintained control over the ordering and management of stock. Therefore, in these salons, even senior hairdressers were denied this experience. Yet, at another salon, the apprentice's role included checking and ordering stock. Consequently, although engaged in a common sociocultural practice, the salons not only had quite different requirements for expertise, but how they afforded participation to workers also differed.

Similarly, for medical practice, the location (e.g. rural town, inner-city suburb, retirement community, remote Aboriginal community), its objects (e.g. characteristics of patients in terms of health, age, dispositions), how the practice is organised (e.g. shared practice, community-based, availability of doctors in rural settings), and its location are all likely to shape how the medical practice is enacted, and, therefore its requirements for and means of enactment. Hence, culturally derived vocational practice only finds tangible form when enacted in particular workplaces. Being competent or a vocational expert, it follows, is linked to the ability to perform effectively in a particular instance of work practice and at a particular point in time.

Yet, more than the situational factors that shape the historically-derived norms and practices, it is through individuals engaging in work that workplace requirements are performed, refined and: remade. While there may exist social suggestions and press, manifested as particular practice (i.e. the culture of practice), it is an individual's understanding, appraisal and enactment of those tasks that constitutes how work is performed. So what constitutes situational factors are not solely the product of local social factors and forms. They also include individuals' subjective experiences of what they encounter, how they negotiate that and elect to participate in the work practice. In different ways, these experiences contribute to the situated practice, as exercise of personal preferences, capacities and agency, also shapes the work practice, hence the requirements for performance and its remaking.

In keeping with the concept of microgenetic development—moment by moment learning (Rogoff, 1990), the remaking and transformation of the practice occurs through these practitioners' participation in and construction

of their work. Both individual learning and the remaking and transformation of the particular practice occur through the process of individuals engaging in work tasks. For instance, it was found that a grief counsellor was able to transform the practice at his workplace to include a personal preference for face-to-face counselling, instead of phone counselling (Billett et al., 2004). Similarly, it has been identified that other workers across diverse forms of work have been able to shape their workplace practices in particular ways (Billett et al., 2005). Consequently, it is important to understand the intersection between the socially suggested requirements for work and the engagement of individuals taking up of that work, through which they learn and develop ontogenetically and remake their work, through microgenetic processes.

## **2.4 Microgenetic and ontogenetic development**

Individuals' experience of engagement in work and their re-making of it comprise inter-psychological processes that are socially sourced and negotiated. They arise in situated practice from moment by moment engagement or microgenetic development (Rogoff, 1990). These collectively contribute to individuals' capacities and attributes over time: their ontogenetic development. More than performing work tasks, individuals acquire a legacy in the form of cognitive and affective change referred to as intrapsychological outcomes. That is, beyond deploying cognitive resources in thinking and acting, their enactment also shapes and changes individuals' capacities and ways of knowing (i.e. cognitive experience). A midwife practising in a birth centre reports that through working closely with birthing mothers over time, she developed a nuanced understanding of their progress in the birthing process (Billett, 1999). She claims her understanding and ways of knowing are quite distinct from gynecologists who are less engaged in the entire birthing process, and are often most focused on difficult births. Such experiences also shape how individuals engage in work and working life. Yet, the construals comprising interactions between social and individual agency will be based on individuals' cognitive experience, constituting earlier experiences. These experiences and the construal of subsequent experiences are unlikely to be uniform. Each individual's construal of the concepts and procedures associated with work and work practices is a product of their personal histories and is particular in some ways (Billett, 2003b). Moreover, some groups of individuals might construe what they experience based on the way they or their cohort is treated. Disabled workers, for instance, face distinct challenges in engaging in and maintaining their capacity to participate in work effectively (Church, 2004), including at times needing to remain invisible and

not making too many demands lest they be characterised as liabilities in the workplace.

In this way, the requirements for work performance are generated historically, culturally and situationally, yet are negotiated, deployed and remade through the interaction between what is provided by society's gifts (Archer, 2000) and individuals' agency and subjectivity. Therefore, understanding the requirements for work and their transformation is not a product of just the immediate social circumstances (i.e. the workplace), and cultural needs and practices (i.e. the occupation), but a rich interplay between personal histories and situational factors.

In sum, the specific meaning of work is located in its embedded form: the particular instance of work practice. Disembedded concepts and generalisable procedures of an occupation exist and play important and necessary roles that are not wholly constrained by particular work situations. While the historically and culturally derived concepts and procedures of occupations are necessary components for performance in the workplace, on their own they are not sufficient to describe and elaborate the requirements for actual performance and their transformation. Instead, the applicability of these historically and culturally derived concepts and procedures, judgments about their worth, the classification of expertise, the pathways towards expertise and performance itself are manifested in and need to be understood in a particular workplace setting or work practice. Barley and Orr (1997: 15) come to a similar conclusion: "Because the clusters of attributes that define technical work depend on doing of the work, we think the most appropriate strategy is to study its practice."

Barley and Orr (1997) emphasise the enactment of work within an observable and enacted instance of practice. Similarly, Garfinkel (1990:77) observes that the localised and enacted qualities of practice stand as key bases for understanding phenomena such as the requirements for work performance: "Every topic of logic, order, reason, meaning, and method is to be discovered and is discoverable, and is re-specified and re-specifiable only as *locally produced* naturally accountable phenomena of order." Therefore, although a work practice at the situational level (Lave and Wenger, 1991) stands as a likely basis for analysis, there is also a need to consider individuals' contributions to that setting or practice: how they construe, engage in and reshape the practice. Such a basis needs to take into account the distinct activities that might be encountered in a work setting where quite different goals, practices and rules might apply (e.g. between design, production and administrative areas) and how individuals engage in and contribute to those settings (Billett and Somerville, 2004), as elaborated above.

### **3. PERSPECTIVES OF UNDERSTANDING WORK PERFORMANCE**

The discussions above lead to a consideration of the kinds of conceptual frameworks needed for understanding the experience of work and what constitutes competent performance at work. Much emphasis has been given to the social origins of knowledge and their manifestation in particular workplace settings. But equally, it is necessary to be clear about the requirements that individuals need in order for them to be competent in workplace settings. This competence is often referred to in the cognitive literature as ‘expertise’ (Ericsson and Lehmann, 1996). Significant work has been done within cognitive science to identify differences between the capacities of experts and novices within many fields of human activity. Through understanding these differences, it is possible to organise learning arrangements to assist individuals move from being novices to experts. As well as being useful for this purpose, (which is important to the overall focus of this book), it also provides a basis to understand what constitutes effective work performance. However, the cognitive literature tends to focus upon the cognitive qualities of individuals as either novices or experts to the detriment or exclusion of social factors and circumstances that shape effective practice in a particular setting. Therefore, in the following sections, the contributions of cognitive psychology into what constitutes expert performance are not only advanced, but also critiqued and augmented by views from social and cultural perspectives of competence. Together, these disciplines provide a framework for understanding the capacities that competent workers need to demonstrate, and also the premises upon which those capacities will be judged as being appropriate in any given work situation.

#### **3.1 The cognitive perspective of work performance**

Much work within cognitive science over the last thirty years has focused on understanding what comprises expertise in order to consider how best to develop this attribute. Through this research, the efficacy of experts’ responses to work tasks has been identified as being premised on their ability to categorise these tasks by their means of solution. The breadth and organisation of experts’ knowledge and experiences permits this categorisation (Gott, 1989) and enables them to engage with workplace tasks in ways quite different from novices who simply lack this knowledge (Charness, 1989) and may, therefore, respond only to the task’s surface features (Sweller, 1989). Active monitoring assists the solution-based categorisation of tasks by experts; involving testing and refining selected responses to a problem—an approach that is simply unavailable to novices (Alexander and Judy, 1988). The rich repertoire of

domain-specific experiences furnishes understandings that permit monitoring and informs experts as to whether the tasks are being completed as anticipated. This monitoring is guided by a rich knowledge base, which enables the progressive evaluation of responses to problems, and promotes evaluation of alternative strategies for securing solutions (Glaser, 1990). Judgements about the difficulty of the task, how to apportion time, assess progress and predict outcomes as the task progresses are enabled by monitoring and categorisation (Chi, Glaser and Rees, 1982). So, these conceptions privilege individuals' contribution to thinking and acting (i.e. cognition).

Because of their rich domain-specific knowledge bases, experts are also able to apply cognitive processes seemingly instantaneously thereby accomplishing routine tasks apparently automatically (Ericsson and Simon, 1984). Previous compilation and chunking of domain-specific knowledge reduces the cognitive load, freeing up the working memory to concentrate on unfamiliar components of their tasks. The breadth and organisation of their domain-specific knowledge permit experts to close gaps in the available information, consistently producing more useful solutions than novices. They are also more efficient with their search for solution options (Anderson, 1982). Further, as a product of extensive experiences within a domain of activity, experts' knowledge has become 'de-bugged' through numerous opportunities for learning through trialling and evaluating responses (Glaser, 1990; Gott, 1989). This permits quicker access to the knowledge required for both routine (regular) and non-routine (new) tasks in the workplace. It seems that when faced with non-routine problems, as might be expected, novices fare worse than experts because of experts' ability to deploy a systematic and conscious solution search (Glaser, 1990). These capacities are underpinned by three kinds of knowledge: (i) propositional and (ii) procedural knowledge and (iii) dispositions. It is these that shape individuals' experiencing, participating and remaking of work.

### **3.2 Propositional knowledge**

References to the kinds of knowledge that underpin human performance within the cognitive literature encompass conceptual and procedural representations of knowledge and their dispositional underpinning. It is these representations of knowledge that individuals hold in memory and are deployed in thinking and acting in the workplace. This knowledge furnishes the basis for performance within a domain of knowledge (e.g. an occupation or vocation). Propositional knowledge comprises facts, information, assertions, concepts and propositions, and is differentiated by levels of stateable facts or concepts of increasing complexity (Evans, 1991). It ranges from simple factual knowledge (e.g. names of things) through to deeper or more complex levels of conceptual

knowledge, such as understanding about workings of complex systems (law, the human body or a piece of equipment whose operating basis is hidden). Depth of understanding within cognitive psychology is premised upon the strength of relationships amongst concepts (Groen and Patel, 1988), emphasising its interconnectedness and causal relationships. That is, deep understanding is based on linkages, associations and an appreciation of the causal links in those associations, not on ponderous deliberations or quantum of knowledge.

### **3.3 Procedural knowledge**

The knowledge that enables individuals to achieve goals such as being skilful is referred to as procedural knowledge (Anderson, 1982), comprising procedures used in thinking and acting. Whenever we humans are thinking or acting we are deploying procedures. In reading text individuals are applying a set of procedures that are associated with word and letter recognition (specific procedures) as well as procedures that are monitoring and interrogating the text. Consequently, to delineate these functions, procedural knowledge has been further classified into levels or orders of procedures to understand the different roles that procedures play. Following Evans (1991) and Scandura (1980), Stevenson (1991) proposes three levels of procedures. First order or specific procedures are employed to achieve specific goals. Being specific only to routine tasks, these procedures are not effective when non-routine or ill-defined tasks are encountered. Hence, when monitoring, evaluation and strategy selection are required second-order procedures are invoked. This order includes breaking the task up into a series of sub-goals so individuals can achieve the task (Greeno and Simon, 1988). First and second orders are managed by forms of third or higher-order procedural knowledge, which act upon lower orders of knowledge by monitoring and organising activities, and by switching between orders, when necessary.

Because procedures are deployed in ways not always observable, this leads to the modification of an earlier view that provided a conceptual distinction between cognitive and psychomotor activities. Indeed, propositional and procedural forms of knowledge are interdependent. Propositional knowledge cannot be engaged without enacting procedures. Yet, procedures are unlikely to be deployed without being directed towards particular goals.

### **3.4 Dispositions**

Further enmeshing these types of knowledge are their dispositional underpinnings, comprising attitudes, values, affect, interests and identities (Prawat, 1989). Perkins, Jay and Tishman (1993a; 1993b) view dispositions as



individuals' tendencies to put their capabilities into action, for example, how individuals conceptualise tasks and the values they place on the deployment of procedures. These dispositions are what motivate and initiate human cognitive processes and the direction and intensity of their application. So while there are cultural values and norms that shape activities and judgements in social practices such as workplaces, there are beliefs and values that shape and direct human performance.

In these ways, the cognitive perspective identifies the breadth and organisation of the kinds of knowledge required to perform non-routine (i.e. new or novel to them) tasks as well as completing regular tasks almost unconsciously. The significance of the cognitive perspective for this chapter is that it identifies the importance of domain-specific knowledge as well as the forms of knowledge that are required for expertise within that domain. The organisation of experts' knowledge around salient domain-based principles maximises the prospect for problem solving and transfer (Groen and Patel, 1988). Indeed, it is the existence and organisation of their knowledge rather than their ability to process that knowledge which sets experts apart from others (Sweller, 1989). Therefore, cognitive constructivism holds that the ability to perform effectively is premised on having domain-specific knowledge comprising both factual and deep knowledge, specific and higher order procedures underpinned by values and attitudes required for performance in the workplace. In particular, deep conceptual and higher order procedures permit performance with new tasks and allow transfer to other circumstances. These are key requirements of effective work performance.

### **3.5 Domain specificity of work knowledge**

The qualities of expertise advanced in the cognitive literature are not held to be universally applicable. Instead, they are held to reside within particular domains of knowledge. Two issues emerge here. First, the organisation of experts' domain-specific knowledge sets them apart from novices who lack both the organisation and breadth of knowledge. However, novices are not necessarily weaker at processing information and may be expert in other domains. The hallmark of expertise in this perspective is the ability to resolve non-routine (novel) problems within a particular domain of knowledge. So performance focuses on domains of knowledge comprising some definable category of knowledge, such as an academic discipline or an occupation, or perhaps the actual circumstances in which they have engaged and constructed a personal domain of knowledge.

Secondly, the cognitive perspective also defines its potency in terms of domains of knowledge that tend to be disembedded. It frequently refers to disciplines or occupational knowledge in a general way, rather than their

application to particular situations. In the sociocultural perspective outlined below, the concept of domains specifically accounts for these circumstances. Consistent with Stasz's (1997) critique of generic competencies, accounts from cognitive psychology fail to fully acknowledge the particular requirements of the workplace (Billett, 2001b), for example, that organisational norms and values are likely to differ across workplaces. The goals for performance in each enterprise are also likely to differ because what comprises domain-specific knowledge in one setting may not correspond with what is required in another. This is particularly the case when the view of domains is abstracted from, rather than embedded in particular practice. So, for instance, an understanding about the vocation of hairdressing may not take into account what it means to be a hairdresser in a particular salon. That is, what is taken as expertise in one work setting (e.g. hairdressing salon) may not be so in another, even when the same vocational activity is enacted (Billett, 2001b). These are not just cognitive phenomena. Also, the cognitive conceptualisation of expertise does not fully account for the circumstances in which knowledge is deployed. Its conception of domains is abstracted rather than being seen as embedded in particular work practice. With its focus on the internal processes of the mind, cognitive psychology alone is not able to furnish a comprehensive conception of expertise with all its social and cultural dimensions.

In summary, the cognitive perspective provides many useful contributions to understanding the knowledge experienced and required for participation in work. Central to these is the importance of goal directed activities as the means by which cognitive functions are deployed and through which skilfulness or expertise is developed. Moreover, as well as monitoring the enactment of processes and learning through practice, the cognitive view reinforces the importance of learning through everyday thinking and acting: the deployment of individuals' cognitive functions. Yet this deployment is shaped by the activities and interactions in which they are engaged. Domains of activities are shaped by historical and cultural factors. However, it is within the enactment of a particular instance of a work practice that the domain is manifested. Further, the construction of the domain of knowledge by the individual is unlikely to be some uniform version of the activities encountered in a particular social circumstance. Instead, individuals' dispositional attributes and previous learning processes stand as the basis for shaping their learning, including the construction of their personal domain of work knowledge.

However, a key criticism of the cognitive approach is that it fails to account for the social sources of work activities and interactions through which individuals engage in and learn the knowledge required for work and reshaping it. Therefore, it is necessary to reconcile the cognitive perspective

with sociocultural theory that furnishes an understanding about situations and circumstances.

### **3.6 Sociocultural perspective of work knowledge**

In previous sections, understanding more fully how expertise is embedded in a particular practice has been emphasised. Consequently, it is important to be able to account for the work requirements of a particular workplace or work practice. Leonteyev's (1981) definition of an activity system as "the social system that shapes activity" provides a useful basis for elaborating the nature, organisation and goals of the work practice in which that activity is undertaken. Activities can be considered as the external embodiment or manifestation of the workplace's requirements. As such, they also shape what is required for work practice in particular circumstances. When delineating activity systems, it is also necessary to determine how the activity is specified and constrained, and by whom (Newman, Griffin and Cole, 1989). These activities can be used to identify the particular set of factors required for achieving performance in work practice. This can only be understood through a consideration of each workplace's goals, division of labour, culture of practice and so on.

In advancing a more socially situated view of expertise, Scribner (1985a) emphasises contextual factors and contributions. She claims that expert performance is characterised by flexibility in modes of solutions to identical problems, creative shortcuts to simplify and economise on mental and physical effort, finely tuned to the environment, and effective use of setting-specific knowledge. This view accentuates the specific factors that shape performance in each setting. For example, in the study of four hairdressing salons referred to above (Billett, 2001b; 2003b), what it meant to be an expert differed across the salons. In the trendy inner-city salon, giving contemporary and fashionable cuts and colours, conversing about style and holding a particular set of values was all-important. In the salon set in a low socio-economic area, managing difficult customers who made strong demands and were prone to complain quite vociferously and forcefully was a hallmark of expertise. In the salon set in a provincial centre that had endured years of a rural recession and drought, expertise was in being able to maintain the clientele. This included balancing the hairdressers' need to secure additional services from clients, with the risk of losing their clientele. In the fourth salon, in a town in the United Kingdom, expertise involved being familiar with the personal histories and backgrounds of the elderly clients who came for weekly treatments. In varying degrees and in different ways, there was a requirement for the hairdressers to be a friend and confidant to the elderly clients, because they were a key social contact. Moreover, there were

identified differences in the activity system in each workplace, despite their sharing the same vocational practice.

Therefore, the domain of knowledge required to understand expert performance needs a situational dimension, one related to the circumstances of the deployment of knowledge. It requires being seen as more than a cognitive phenomenon. Taking the ideas from cognitive constructivism above, expertise is fashioned within particular domains of activities or occupational practice (i.e. sociocultural practice), yet manifested in a particular situation comprising a particular configuration of social forms and practices. This embeds the concept of expertise at the situational level. Lave and Wenger (1991) refer to this as full participation in a community of practice, rather than expertise. Their concept of full participation is that all practitioners are peripheral because the work practice itself is constantly evolving. They refer to becoming an expert as a pathway to full participation in the community. Hence, access to, and participation in, the workplace's activities are required to meet the performance requirements of the workplace. Full participation implies being capable with new activities, performing new tasks and comprehending new understandings, which is analogous to and reconcilable with the cognitive view. This supports the view proposed earlier that an embedded view of domain-specific knowledge is required to understand the performance requirements of particular workplaces. Such a view responds to the need for expertise to be adaptable and transferable. Therefore, to understand the requirements for work necessitates accommodating situational requirements and also some means by which individuals can come to develop their own domains of practice. Their relational, embedded, competent, reciprocal and pertinent characteristics are important.

Consequently, to understand what constitutes the experience of work, workplace requirements and their remaking, it is necessary to include the enactment of skills and judgements in terms of their utility within particular circumstances. The workplace's range of variables means that it will have unique qualities that will determine what constitutes expert responses to particular problems (Billett, 2001b, 2001c). Even the most apparently standardised work activities will have unique variables. For instance, the clientele and composition of staff in a particular fast food chain or bank branch will render the task of working in and managing that work practice in some way unique. Work performance requirements are the product of extensive social practice, with meaning about practice derived by becoming a full participant, over time, and with understanding shaped by participation in the activities and norms of that practice. Developing an understanding of the variables, goals and mechanism for success are likely to result from extended participation in the workplace. Expertise comprises competence in the community's discourse in routine and non-routine activities, mastery of new

understanding, and the ability to perform and adapt existing skills. Taking the study of hairdressers referred to earlier, it is unlikely that placing an expert hairdresser from one salon in one of the others would result in their ability to perform expertly. The requirements, norms and discourses of each salon are quite different and are required to be learnt. No amount of transfer of skills will assist the hairdresser to learn about the personal histories of her clients, for instance. Again, and analogous to the cognitive perspective, understanding the particular mores of the workplace, knowing what is and was is not appropriate behaviour or outcomes, is a premise for performance in problem-solving. Expertise requires pertinence in the appropriateness of problem solutions, such as knowing what behaviours are acceptable and in what circumstances are also qualities of expertise. This quality reflects the values a workplace assigns to problems and the appropriate amount of effort and understanding of what knowledge is privileged. In sum, this view emphasises rich association between setting and expertise—what is required to be effective in particular workplaces.

#### **4. COMPLEMENTARITIES BETWEEN THE SOCIAL AND COGNITIVE CONTRIBUTIONS**

There are both commonalities and complementarities across the cognitive and sociocultural perspectives that can assist in understanding the individual and social dimensions of work (Billett, 1996). From the individual and subjective view, the construction of domains of knowledge, repertoires of experiences and their organization, and the role of personal dispositions are cognitive legacies from engaging in socially-derived goal-directed activities. Their formation and sources are explained by sociocultural theory which also acknowledges the diversity of practice and why that has to be the case. In this way, together and when reconciled, the cognitive and sociocultural perspectives outlined above provide a basis to understand further the requirements for a skilled workforce (Billett, 1996). The sociocultural literature yields ways of accounting for the situational factors that make sense of both common attributes and domains of knowledge. By acknowledging the circumstantial factors involved in particular workplaces, the literature provides a basis to reconcile the three perspectives to advance a set of dimensions of work practice, which can be used to determine the requirements of a particular work practice. Moreover, it is these localised factors, plus those brought about by changing cultural practices and technologies that individuals engage with and through which their agency acts to remake the vocational practice.

The individual contributions identified through the cognitive literature can be seen as the ‘cognitive experience’ (Valsiner, 2000). This experience

comprises the understandings and capacities, including their values and beliefs, referred to as dispositions within the cognitive literature, which individuals possess and which shapes how they come to construe and construct the ‘social experience’—what they encounter in a particular workplace, and representing the legacy of historical, cultural and situational factors. This perspective is consistent with the idea that the domain of knowledge can be both culturally-derived and person-dependent. That is, that the individual’s construal of their vocational practice represents an important manifestation of that practice and comprises part of the cognitive experience. Yet, from a different perspective, a contribution of the social experience is to suggest that the domains of the human activity are shaped by cultural and social factors. Moreover, the social factors that shape practice are prone to change because the sources of these factors are subject to constant transformation and subject to construal and constructions by the individuals who engage in work and remake those practices. This is an outcome of individuals’ cognitive experience negotiating with the social experience—enactment of two distinct kinds of domains of knowledge.

## **5. CULTURAL, SITUATIONAL AND INDIVIDUAL GENESES OF WORK LIFE**

In conclusion, despite the social and cultural geneeses of knowledge that have developed over time, the individual experience of engaging in work and realising workplace goals is central to work and conduct and remaking of work. Yet, simultaneous to that learning, the norms and practices that constitute the work practice itself are remade and transformed. The work to be done, its enactment and transformation can be seen as inter-psychological processes leading to intra-psychological outcomes—products of social contributions—that arise in situated practice from moment-by-moment engagement or microgenetic development (Rogoff, 1990). These then contribute to individuals’ ontogenetic attributes or learning.

There is an identifiable legacy of hairdressers’ participation in particular hairdressing practices (Billett, 2001a; 2003b), comprising individual learning and remaking of the hairdressing practice. However, this legacy or competence represents a negotiated outcome between the situated social suggestion and individuals’ earlier experiences. Ontogenetically-derived preferences shape how the hairdressers engage in hairdressing tasks and construct their hairdressing knowledge, albeit through collective processes. These experiences also construe how individuals engage in work and working life. Therefore, more than understanding competence in terms of

cultural and historical derived sociocultural practices, it is necessary to account for how vocational practice is constituted situationally and influences the activities in which participants engage in relationally and learn through their participation. This process has been labeled co-participation at work (Billett, 2001a, 2002a)—the duality between what the workplace affords individuals in terms of access to activities and interactions from which they learn, on the one hand, and the degree to which individuals elect to engage with what is afforded them, on the other. That is, individuals decide what constitutes the invitational quality of workplace affordances. Therefore, objective analyses of work activities and interactions need to be coupled with subjective experiences of work.

To return to Figure 2.1, the transformations in the socio-genesis of vocational knowledge comprising the social suggestion and their interplay with individuals' ontogeny depicted in the figure are held to be interdependent, not one subjugating the other (Billett, 2005). This interdependence is enacted between levels as cultural practices and localised requirements transform, and as individuals engage with the practices agentially and purposefully thereby reshaping that practice. So although individuals' intrapsychological outcomes likely have some situational legacy, it is not a mere replication of workplace suggestion; they represent individuals re-working and re-making what they experience (Billett, 2003b, Billett et al., 2005) and in this way transforming culturally-derived practices. This transformation may ultimately contribute to phylogenetic development through generating practices that operate across diverse cultures. Consequently, the remaking of cultural practices can be seen as having individual, situational and cultural bases albeit negotiated in ways that are interdependent.

It is at the situational level, where cultural practices are renegotiated as individuals construe, remake and subsequently deploy them. This remaking necessarily occurs through the everyday moment-by-moment or micro-genetic developmental processes through the exercise of conscious thought (Rogoff, 1990), which is intentional and directed (Berger and Luckman, 1966). So there is no separation between individual engagement and learning, and this remaking. Giddens (1984: 114) notes that social systems "do not reproduce themselves, they require that active production and reproduction of human subjects." As Scribner (1997) notes, thinking is fitted to the functional requirements of the particular tasks. Yet, such thinking is required to be adaptive:

The notion of creativity stresses human production as something new. Yet thinking in the dairy was both adaptive and creative. Adaptation of thought to its functional requirements had an active, not passive character, and it proceeded on the basis of worker invention of new

solutions and strategies. Invention is a hallmark of creativity and it played a major role in all of the occupations studied in the dairy community. (Scribner, 1997: 378)

The immediate or situated social practice, with its cultural and historical geneses (Scribner, 1984; Cole, 1998) is therefore important in understanding the requirements for work performance (Billett, 2001b; Brown et al., 1989; Engeström and Middleton, 1996), within and across instances of work activities (i.e. for adaptability and transfer), for understanding acts of collectivity (i.e. shared processes of learning) and their contributions to social suggestion, learning and appropriation. This learning or appropriation bridges the historical heritage of human beings and each new generation's taking over that heritage (Leontyev, 1981). If, as Valsiner (1998: 114) claims the "active role of appropriation presents the learner as a constructor of new choices, not constrained to those in immediate circumstances", the processes of and goals for learning throughout working life, in part, can be understood by how individuals' capacities are exercised within the requirements of specific workplace situations, and their prospect for applications in those and other work settings.

Yet, situational specificity also illuminates the limits of theoretical constructs that privilege the social (e.g. activity systems, situated cognition, distributed theories of cognition, cultural-historical activity theory). These views tend to privilege knowledge structured through history, comprising both past and existing cultural need as well as situational demands, yet seek to embed individuals in those circumstances. However, viewing individuals as situationally embedded (Engeström, 1993), socially subjugated (Grey, 1994) or saturated (Gergen, 2000) fails to adequately account for individuals' role in the simultaneous processes of learning and cultural change. More than the immediate social suggestions, is the energy, creativity and adaptability of individuals who participate in and adapt that knowledge to new circumstances (Baldwin, 1898; Billett and Somerville, 2004; Valsiner, 2000). It is in situated practice where the two different continuities of the workplace and individuals coming together are intertwined, negotiated and enacted: i.e. the work practice and those of individuals become intertwined in ways that are interdependent in relational ways (Billett et al., 2004)

In sum, it has been proposed in this chapter that understanding what constitutes work activities as institutional facts (Searle, 1995) requires elaborating the genesis of knowledge and practices that constitute work and how they are transformed over time. Institutional facts have cultural, social and situational sources, and collectively contribute to the social experience and its enactment through the mediation of particular sets of localized



workplace factors. Individuals' cognitive experience shapes how they engage in and enact work with each remaking generating a legacy in terms of both individual (i.e. ontogenetic development) and social practice (i.e. remaking of the work practice). Workplace performance needs to account for situational requirements for performance and the engagement of those conducting that work, that is, both objective analysis of work and subjective analyses of workers.

It is these issues that are taken up in the next chapter, which examines the relational interdependence between social and individual factors that constitute work, work performance and changing work.