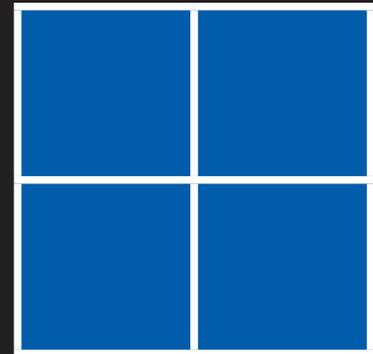


What is Skill? An Inter-Disciplinary Synthesis

Francis Green

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What is Skill?
An Inter-Disciplinary Synthesis

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Abstract

When economists, sociologists and psychologists discuss skill they often appear to be talking about different things, even though they each ascribe high importance to it. To make progress and to facilitate inter-disciplinary communication it would be better to be sure what we mean by skill. I propose a simple functional concept that offers the prospect of dialogue and progress in skills analysis. Skills have three key features: they are Productive, Expandable and Social. I advocate this “PES” concept of skill, examine how far the approaches of economics, sociology and psychology conform to it, and compare “skill” with “competence” as widely used in human resource management and in educational discourse. I consider implications from the intimate connection between skill and value, some of which are contradictory. Finally I describe some common typologies of skills and skills mismatches that follow on from the PES concept.

Introduction

“Skill” is widely regarded as a focus for analytical research and as a core object for policy interventions in the modern global high-technology era. A substantive body of evidence shows that different skill levels have large economic effects for individuals, employers, regions and whole national economies. Yet there is no consensus among social scientists about the meaning of the concept of skill. When economists, sociologists and psychologists discuss skill they often appear to be talking about different things. When translated, scholars in different languages have still another take on the matter. Dialogue and discussion between disciplines and cultures is rare, so similarities and differences are not made transparent or resolved. Disciplinary segmentation permits conceptual and semantic differences to persist; and outsiders to academic discourse hear different approaches, depending on whom they are listening to. Unfortunately the scope for confusion does not end at the library door. Unlike constructs in the natural sciences, skill is one of those social science words in common parlance with many meanings, numerous synonyms such as “ability”, “competence”, “knack”, “aptitude” and “talent”, and varied imprecise translations in other languages.

If skill is so important for economic progress, we had better be sure what we mean by it. It needs a careful and sufficiently broad definition to support a consistent analysis and a common dialogue. Narrow notions typically betray particular preferences, and intellectual tussles can themselves reflect conflicting interests. The consequences of the lack of clarity and consensus over the concept of skill are diffuse. They include potential misconceptions such as the conflation of employers’ demand for skill with workers’ demand for skill formation opportunities, or of the “subjective” with the “objective”; unnecessarily narrow perspectives towards policy interventions; ill-informed critiques or ignorance of other disciplines’ approaches; and difficulties with conceptualising the role of work attitudes. Ultimately, the confusion is a potential break on the development of an integrated cross-disciplinary analysis of skill. At the least, researchers time and again find it necessary to clarify the terms they are going to use, often re-inventing definitions and measurement concepts, before embarking on their analyses. It would be better if social scientists could agree terms.

In this paper I advocate a functional concept of skill that builds upon some commonalities across disciplines, and that offers some prospect of dialogue and progress in inter-disciplinary skills analysis. I am aware that this is a field in which almost everyone has their opinions,

newcomers as well, as to what they mean by skill. There have been several distinguished scholarly contributions on the concept of skill, including a stimulating and much cited collection published in a 1990 issue of the journal, *Work and Occupations*; and countless glossaries annexed to public reports have paid obeisance to the need for definitions. But that 1990 issue left unfinished business, in so far as it was mainly addressed at an audience of sociologists, and no papers made an attempt to forge channels of dialogue with economics. Since then there have been major developments in measurement protocols that have forced continual re-thinks of conceptual frameworks, including successive skill test surveys (national and international), the demise of the U.S. Dictionary of Occupational Titles and its rebirth as O'NET, and the parallel development in both Europe and the US of a task-based (or "job-related") approach;¹ while substantial volumes of research have turned to skill for their understanding of change in modern socio-economic life.

To try to progress beyond the 1990 positions within sociology, and the plethora of *ad hoc* glossaries, this paper draws upon an immersion in multiple traditions in the course of my experience in designing, using and teaching about skills measures for socio-economic research over the last twenty years. My aim is to advance a concept of skill which encompasses critically the approaches of economics, psychology and sociology; which is functional, serving as a vehicle for theoretical and empirical scientific progress, and thence for inter-disciplinary policy development; and which fosters greater clarity in contemporary skills debates among those steeped in diverse traditions.²

The concept of skill that I propose is intended to be at once scientific, oriented towards human, social and economic progress, and relevant for a discussion of social and economic action in 21st century settings. In other words I aim to situate skill within the tradition of political economy. Thus, skill is a personal quality with three key features:

- i. **Productive:** using skill is productive of value;
- ii. **Expandable:** skills are enhanced by training and development.
- iii. **Social:** skills are socially determined.

¹ National Research Council (2010); Felstead et al. (2007); Handel (2008); Green and Keese (2011). The task-based approach is now being used in many countries, including as part of the OECD's Programme for International Assessment of Adult Competences (PIAAC).

² Consensus over policy or analytical issues, however, is not the objective: as we shall see, the intrinsic association of skill with values ensures that the topic will continue to be contested. I have also been deliberately sparing in my references: this is not a literature survey.

Other definitions could be applied, but the above delineation – denoted the PES concept of skill – has boundaries which make the concept functional for locating skill’s role in economic and social systems, and which afford it an encompassing role across the social sciences. Though broad and covering most common usages of the term, not all qualities are included. The focus on productive activity implies attention to qualities relevant for economic progress, but excludes other qualities such as might be involved in leisure pursuits.³ Another advantage is that the concept is action-centred, premised on how individuals and social agents can change these qualities. Attributes that cannot by their nature be enhanced are not considered as skills.

The PES concept introduces no individual features of skill that have not been written about before. Rather, the contribution of this paper is to integrate perspectives across social science disciplines. With the PES concept, skill can vary according to concepts of value, which themselves range between and within social science traditions of economics, sociology and psychology. This differentiation is partly why these disciplines have talked about "skill" in contrasting and segmented ways. The PES concept encompasses, though does not remove, interdisciplinary differences.

The paper first shows how far each discipline's concept of skill conforms to the PES concept, and uses the discussion to try to clarify the treatment of problematic aspects of skill, including individualism in human capital theory, the measurement of complexity, and the characterisation of work attitudes. These problematic aspects are intimately related to familiar perspectives on valuation, and the implications of these for skill are discussed in the following section. A robust conclusion is that skill has a normative content, associated with the location of value at its core. The two ways in which skill is socially determined are then described, and the stipulation that skills are expandable is defended. The paper then shows how the PES concept of skill and the parallel concept of “job skill” give rise to common typologies used in the analysis of skills policies. The last section returns to my theme of communication blockage between social science disciplines, and the expressed intention that the PES concept might enable inter-disciplinary debate to proceed in a meaningful fashion. It defends the need for a broad but well-crafted concept of skill that will be usable for social and economic analysis.

³ For example, the amateur tennis player's ability to volley a tennis ball would not be counted as a skill, unless one adopted a non-economic concept of value to include the satisfaction of playing a good shot.

Three Disciplinary Perspectives: Economics, Sociology and Psychology

In neoclassical economics, skill is one of the main ingredients of “human capital”, the other being health. With a strictly individualist connotation, human capital is the value of a person's stream of current and future prospective earnings discounted to the present.⁴ Education and training are investments in the accumulation of skill/human capital, with prospective if uncertain returns, which underpin rational individualistic decision-making about how much and which types of investment to make. As long as it is productive of a stream of earnings, nothing needs to be said about the content of skill, except to classify where it can be used because this affects its financing. If skill is transferable between one workplace and many others, in a competitive market with no borrowing restraints workers pay to acquire their own skills. If there are labour market imperfections, or if the skills are firm-specific, the costs and benefits of training are shared between worker and employer.⁵ This approach to skill exhibits an attractive consistency and simplicity.

Nevertheless, the neoclassical concept of human capital reflects a certain objectification and alienation of workers in market capitalism. The scientific flaw, according to “non-neoclassical” critics within and beyond economics, is that, in regarding human capital as a thing to be acquired, like other capital, the neoclassical concept misses the social context of skill. The incentives and outcomes are real, but what is found inadequate by critics is the assumption that working people are islands of exogenous preferences and aspirations, in a world with exogenously determined technologies and optimal management policies.⁶ Rather, the acquisition, valuation and utilisation of skill are each socially determined processes, which implies that exogenous individuals and technologies, and optimal decision-making, cannot be assumed. The acquisition of skill is conditioned by attitudes and expectations that are imprinted with social norms; while opportunities for skill acquisition are circumscribed by social class. The value of skill lies in the value of the product which itself is socially determined (unless one accepts all neoclassical premises about individualistic consumers and producers). For example, the value of skill is perturbed by the “social construction of skill”, whereby social processes, including power, affect who can sport the label of “skilled labour”, and who can claim the rewards. The use of skill in organisations is affected by the quality of

⁴ Examples of classic texts are Becker (1964) and Mincer (1974).

⁵ Hashmito (1982); Stevens (1994; 1999); Acemoglu and Pischke (1999).

⁶ The charge of alienation has been the hallmark of the critique of political economy since the writings of the early Marx. See Avineri (1968). For an exposition of the critique of human capital theory, see Ashton and Green (1996: Chapter2); or Green (1992).

employment relations, and by management strategy that is culturally determined. In all these ways, it proves to be a serious limitation to suppose, as the neoclassical model does, that individuals' skill decisions arise from maximising some utility function that is purged of the social. In short, while the neoclassical view has the first two features of the PES concept of skill, the critique of the individualism of neoclassical economics implies that it does not incorporate the third essential feature, that skill should be conceived as socially determined.

Within much of heterodox economics⁷, by contrast, though education and training are still regarded as investments, issue is normally taken with the equation of value to price. Since market imperfections and information asymmetries (between consumers and buyers or between workers and bosses) lead prices to diverge from their theoretical free-market levels, the values of individuals' skills diverge from their productive contribution of value to society. Heterodox economics includes, too, the possibility of sustained mismatches between employees' skill and the skill required in the jobs they hold (termed "job skill"⁸). "Rational" individualistic decision-making about educational investments is also a compromised assumption, in the face of much evidence and theory about the importance of context for learning and for decisions in uncertain situations.⁹ Heterodox accounts of skill can incorporate social theories of how work skills are learned, which also stress the importance of the environment.¹⁰ In several respects, therefore, heterodox economics draws on ideas from sociology. Overall, heterodox economics' accounts of skill fit more comprehensively than neoclassical economics' theory of human capital into the PES framework concept.

In contrast to neoclassical economics, sociology looks inside the production process for its concept of skill; its discourse centres on the complexity of tasks. In this definition, to exercise greater skill is to carry out a more complex activity.¹¹ With activities bundled into jobs much of the discussion within sociology has been about job skill, which is seen as the primary determinant of social class. Workers can acquire the ability to do complex tasks, with greater

⁷ Heterodox economics is a loose configuration of several schools of economic thought, often rooted in classical political economy, that have in common a rejection of the individualistic conceptions of neoclassical economics. "Human capital" is a term often used as a shorthand for education and training even by heterodox economists and others who would agree with the critique. The term itself is acceptable, but the individualistic methodology is contested.

⁸ A "job" is not itself a watertight concept. Workers, especially more educated ones, have a limited autonomy and can sometimes modify the contours of their jobs to suit their own preferences and skills.

⁹ Tversky and Kahnemann (1986)

¹⁰ Lave and Wenger (1991).

¹¹ Attewell (1990).

complexity needing more learning, and requiring greater reward. Thus sociology's perspective is encompassed in the PES concept of skill.

Challenging problems lie, however, at the heart of the proposition that complex activity is the substance of skill: how to measure the complexity, and how to link it with value. Measurement has come from "expert" systems, such as the US Dictionary of Occupational Titles (DOT), its successor O'NET, or from the lengths of required education, training or related work experience. These are quite loose proxies for a frankly fuzzy concept. And is complexity, even if it can be well defined and measured, always sensibly related to learning input and value? As Attewell (1990) has insisted, the most complex of tasks can become second nature, almost unconscious and seemingly easy: so much is shown up in a great deal of ethnomethodological research. Moreover, one can look for complexity in a choice of spaces, and be deceived by not opening the right doors. The discoveries of tacit or latent skills, especially emotional and aesthetic skills, are cases in point: the labour processes that utilise these complex tasks are not new, but it took the lens of feminist political economy to point them out after many years of invisibility in social science.

The ability to work autonomously, to exercise some discretion over work tasks, and thus to operate without close external direction, is an important complement to complexity which normally requires a higher level of understanding.¹² Complex tasks are likely to be less easily specified, more infused with contingencies and subject to uncertainty; so greater worker autonomy is likely to be found in the organisation of complex work. For much of the sociology of labour, this association underpins the concept of skill, drawing on the Marxian concept of human labour.¹³ For Marx it is the combination of conscious plan and action that stamps labour as human; and the subordination of labour and accompanying loss of control constitutes alienation. To the extent that a skilled worker retains some autonomy over the execution of complex tasks, this is to retain that element of humanity even in a capitalist work context. Skilled work, as in modern utopian accounts of good work, is the heightened fulfilment of a need. Its archetype in Braverman's influential account is the 19th century craft worker before the advent of Taylorism in the 20th century.¹⁴

¹² See Doyal and Gough (1991: 60-61) for the relationship between understanding and autonomy as a human need.

¹³ One strand of neo-Marxian thought fuses autonomy into the very definition of skill; but this conflates incomplete complementarity with identity, and misses the fact that even closely rule-bound operations can be complex (Attewell, 1990: 443).

¹⁴ See Braverman (1974).

Sociology's other deep contribution to our understanding of the concept of skill is the recognition that skill can be "socially constructed".¹⁵ A divergence can arise, through the exercise of social power, between a job's social perception and status and its real level of job skill – in effect, through a distortion of the value generated. Social closure is the classical form that this adjustment takes – limiting entrants to an occupation, where the bar is set above the level that might be justified by job complexity.¹⁶ The attribution "skilled job" then becomes a source of market power, while the association between "high wages" and "skilled" seeps into tautology.

The theory of the social construction of skill provides a telling account of gender discrimination, whereby certain jobs predominantly held by women are conceived as low skilled, which self-justifies the consent to low pay, which then reinforces their perception as low skilled, and not suitable for men, and of lower value than men's work. This discriminating vicious circle can be broken by the dissection and exposure of job content, though even here the control of competency definitions and their link with "comparable worth" policies means that skills remain contested.¹⁷ On occasion technological change is radical enough to provoke a break with tradition: the eventual exposure of print workers in Britain, when faced with electronic technology to replace linotype, is a case in point. Printing was a male enclave in which the skilled status and high pay of printers were sustained long after the availability of new technology. It was ended only through a reorganisation of the industry, including relocation. In some versions of the theory, the social construction of skill goes beyond the disjuncture between "real" and perceived skill, arguing that social processes such as gender determine real processes of value formation. Thus technology, in this account, cannot be assumed to be an exogenous determinant of values if the design of new technologies is driven by a gendered sensibility.¹⁸ Skills might then differ according to sex, but the origin of the differentiation is gendered, not natural.

The main constructive lesson of social construction theory is that neither self-perceptions nor social classifications of skilled work can be taken as neutral concepts: both are subject to potential bias, to be revealed above all by thorough analyses of job content. Caution should be enhanced especially where a job has been subject to any form of class-based or gender-

¹⁵ See, for example, Cockburn (1983) Attewell (1990); Wacjman (1991); Steinberg (1990).

¹⁶ The critique of occupation monopolies lies deep in the classical writings of both sociology (Weber) and economics (Smith).

¹⁷ Steinberg (1990).

¹⁸ Wacjman (1991).

based social closure. The theory also provides another reason why market valuations may produce biased indicators of skill: in short, just because a job is well-paid, one cannot assume it is high-skilled. Finally, social construction theory reminds us that, since the “skill” label is contested, it should not be regarded as an immutable, independent, quality of individuals.

Nevertheless, even though market values (hence skill labels and perceptions) can be distorted by unequal power, social construction theory does not imply that skills should be conceived independently of value, and therefore does not absolve skill theory from an engagement with theories of value. In this, the sociological approach to skill has been somewhat silent, tending to fall back on complexity of production as skill’s true measure. Moreover, the literature on social construction theory should not lead us to a morass of relativism or untestable generalisations. Some sociological accounts juxtapose objective and subjective concepts of skill, with the latter somehow ephemeral or residing only in one person’s opinions. But this dichotomy is false: all skills are social qualities, yet are rooted in real, objective, processes not in perceptions. Moreover, the fact that skills are socially determined provides neither an argument against an empirical-driven approach, nor a reason to reject quantitative measures that uncover the trends and relationships between skills and the outcomes that societies are interested in. Some writers have rejected a positivist approach to the quantitative measurement of skill, but there is nothing in the concept itself to warrant such a stance. The practicalities of skills measurement – the pros and cons of various approaches – have been discussed elsewhere; while no strategy is ideal, the problematic issues are no more challenging than those of many other social and economic indicators.

The idea of skill also has a long lineage in occupational and educational psychology, being an inherent part of the study of learning processes. Psychologists were writing about the intricacies of detailed technical activities and how to learn the appropriate skills, long before skill entered central stage in public discourse. The relevant modern concept in occupational psychology is “competency”, defined as the ability to successfully perform a range of tasks to a high level of performance; while the idea of “competence” refers to the required standards needed to perform a job or set of tasks. In practice the two ideas, competence and competency, have merged and are often used interchangeably. The competence movement has played a significant role in the evolution of vocational education, and in the rise of human resource management. Human resource functions for which a competence framework has been used include recruitment, personal development, performance management and wage-

setting; and competence frameworks have been used as the basis for systems of qualifications.

Through these functions, psychology joins with sociology in evaluating the social context in which skills are learned and used, and through its development of job content analysis provides material for undermining the deceptive character of socially constructed skills, and in support of comparable worth policies within organisations. Psychology's views of skills inside the organisation do not necessarily endorse the emphasis on complexity; and indeed the more ethnographic studies tend to show up the complexities of activities normally not rated as skilled.¹⁹ Nevertheless job analysis, built upon competence frameworks, delivers the normative valuation process that occupational psychology substitutes for market valuation. In psychology, competences create value, but that value is determined by the complexity and range of its skilled labour inputs. Heterogeneous jobs are made comparable through commensurate grades using expert judgements about the competence levels involved, while educational qualifications are similarly ranked with descriptions of the competences they certify. This principle stands in contrast to economics where judgements of equivalence are delivered by the market or by the revealed preferences of those who demand skilled labour.

Because competence is a functional concept in management and training, it has proved relevant to break it down into three components: skills, knowledge and attitudes. However, occupational psychologists typically have trouble finding a consistent and precise definition of skill.²⁰ "Skill" is typically used to refer in a narrower way to whether some can do some task or set of tasks. It is conceived and socially recognised in this narrow sense within the UK's market-oriented system of National Vocational Qualifications. But that "can do" is backed up by a knowledge base; and whether the tasks actually get done depends also on whether the worker is motivated and committed to doing them. In the corporatist system of competence recognition found, for example, in Germany, skill encompasses the knowledge needed to exercise a broader range of functions. Such conceptual differences across nations cause potentially deep problems for cross-country harmonisation of standards.²¹

By contrast, the need to sub-classify the components of competence in this way is not fundamental within economics, wherein skill, as human capital, is defined to embrace knowledge and attitudes as well. Thus "skill" in economics is similar to "competence" in

¹⁹ Attewell (1990).

²⁰ National Research Council (2010: 32).

²¹ Clarke and Winch (2006).

psychology. The difference between the two disciplines is that, in psychology, the focus is on the generation and function of the components of competence, while in economics the interest lies primarily in measuring the market valuations of the components.

On the semantic issue of the use of the word “skill”, the economist’s more inclusive definition of skill is closer to the concept that drives much of the policy discourse. When employers complain of skill shortages, if pressed they may mention technical skills but they also frequently refer to shortages of workers with what they consider to be the right attitudes and values, such as conscientiousness and reliability.²² And the educational implications of job requirements extend to the need, not just for relevant cognitive and academic skills, but also for corresponding attitudes and values.²³ In economics, any quality that makes a worker more productive can count as a skill; while for human resource specialists it is important to unpack the concept into its components. Nevertheless, “skill” is also used in both professional and common parlance in the narrower sense of ability to do something, often with reference to the “skilled trades”. In the UK, the language of competences has been used to define skills at the lower end of the spectrum in very narrow terms. In the European Qualifications Framework, which attempts to match national qualifications to cross-nationally commensurate learning outcomes, levels are defined in part by their skill levels described in terms of the complexity of tasks that qualification holders can do.

The principle of specifying competences is at the heart of recent “task-based” approaches to the measurement of job skills, for use in economic analysis. Deployment of the psychology-driven O’NET content model describing occupations in the US is a case in point: in addition to “Abilities”, “Knowledge”, “Skills” and related contextual measures, analysts carefully delineate the “Work Styles”, personal attributes such as self-control which are related to work performance. Other task-based, competency-inspired measurement strategies have been developed in Britain, Germany, Italy, Spain and elsewhere.²⁴

Even though economics writers have embraced a broad definition of skill, economics itself is not exactly at ease when it does turn to the components of competence. True, applied economists have recently been finding that attitudes and preferences – typically captured by the curious phrase “non-cognitive” skills – can have large impacts alongside cognitive skills

²² Oliver and Turton (1982).

²³ Bowles and Gintis (1976; 1988).

²⁴ <http://www.onetcenter.org/content.html> [accessed 22.12.2010]; Green and Keese (2011).

on educational and economic achievements.²⁵ Whether directly, or indirectly through enabling the development of cognitive skills, intervention programmes to improve certain behavioural traits are being found to yield substantial returns, private and social, notably for disadvantaged children. Yet economic theory – in contrast to applied economics – does have an attitude problem, since preferences are typically conceived as individualistic and exogenous (that is, unaffected by socio-economic processes). While it is possible to model the formation of preferences, this tends to nullify most of economics’ normal welfare conclusions, including its privileging of market-based solutions.²⁶ The importance of attitudes in the capitalist workplace thus points up again the problem with the neoclassical conception of skills as individualistic qualities. If preferences, attitudes, dispositions and expectations concerning work are affected by social and economic context, then these “skills” are, on the contrary, socially determined.

Interrogating “Productive”: the Significance of Value

This conceptual overview has revealed that the three disciplines of economics, sociology and psychology have developed fruitful and partly overlapping concepts of skill. The neoclassical economics’ approach is centred on value, but its methodological individualism has abstracted its concept of skill from social processes. Sociology’s approach, through its analysis of the social construction of skill, points up the potential distortions from market values and centres the measurement of skill upon its concept of complex production; but has only an incomplete alternative approach to skill valuation centred on social power. Psychology has a well-developed analysis of job competences, which are gauged in grades or levels, and similarly orients educational achievement towards the development of competences. Thus, even more exclusively it seems than with sociology, valuation is derived from inputs to the production process. In this, psychology distantly echoes the wisdom of economics in the 19th century, when the labour theory of value held sway.

The PES concept of skill, by putting value at its core, should facilitate communication between these perspectives. The conceptual differences are not abolished, but they are revealed as differences over theories of value. The centrality of value in skills discourse is what makes skill central to social science, and allows it to acquire a major role in socio-

²⁵ Heckman (2008); Blanden et al. (2008); Martins (2010).

²⁶ Bowles (1998).

economic policy formation. Improving or raising skill can be construed as desirable if skill is by definition productive of value. If different disciplines can agree that skills are qualities that produce value, then dialogue on skill might be facilitated. Of course, the question is begged – “what is the source of value?” – thereby locating the problem of the concept of skill at the centre of social science.

Occupational psychology deploys its concept of job competence levels to develop a normative theory of pay. Linking pay to complexity holds out the prospect of equality of opportunity within jobs, complementing policies to ensure open access to learning opportunities. If job competences are properly and fully defined, and their levels made commensurate across occupations and sectors, the hope is that skills can be fairly and efficiently rewarded. In contrast the modern economic theory of value stresses the utility to consumers of the products of skilled labour. In a competitive labour market the reward for skilled labour is equal to the value of the extra services generated by the least productive worker that it is profitable to employ.

Yet private and social values need not coincide. The social value of what is generated by a person’s skill might be far greater, or much less, than its value for the individual deploying it. Examples of the latter are externalities and positional services.

Suppose that the social value of an output is negative: society would be better off without it. Who, to put it starkly, wants a skilful murderer? To a pacifist, the skills of a great soldier are an affliction, not something to be applauded. And how should one assess the skills of the drug dealer? Such questions illustrate how, contrary to common discourse, skills can in principle be negative quantities. To countenance this is not merely to entertain an intellectual curiosum. It may be as valid for social policy to reduce negative skills as to promote positive skills. The generation of criminal skills, for example through peer-group learning in poorly resourced prisons, is a known social problem and deterrent to the use of custodial sentencing. Policies to counter-balance this process are in essence skills policies.

Negative skills are but one example of a general issue that occurs when private and social value diverges. Another is the case of activities that create positional goods or services, which are defined as valued, not for their absolute quantity but for the rank which they confer. Education is sometimes argued to be, in part, a positional service.²⁷ Analogously positional

²⁷ Adnett and Davies (2002).

skills (not to be confused with sporting abilities) are qualities that contribute to positional outputs (for example, an advertiser's ability to elevate one brand at the expense of others). Similarly, rent-seeking skills that enable one business to thrive at the expense of another have only a private value. Conversely there are numerous instances in which positive external benefits mean that the social value exceeds the private. So the valuation of skills depends on one's perspective – private or social.

In the private perspective the value of work skills is often equated to the generated market values. However, price does not necessarily measure the value generated by the skilled workers. In countless cases, not least in voluntary labour, in caring labour or in any employment where work has significant inherent interest and fulfilment, the value lies in the direct satisfaction of needs as well as in the money exchanged for the labour.²⁸

For a social perspective on valuation and skill, a normative account is called for, as was explicit in my example of the skilful soldier. Such an account is essentially both a philosophical and a political statement of the skills needed for the good life. An interesting multi-disciplinary attempt to frame the key skills needed for a “successful life” in all cultures hit upon three main categories: “interacting in socially heterogeneous groups”, “acting autonomously” and “using tools interactively”.²⁹ These are higher-level skills that are conceived as taking different forms across social and cultural contexts. Whether these particular foci command widespread acceptance depends not just on an intellectual argument about human and social needs but also on widespread adherence to a democratic political process. Skills may be personal qualities but they are inherently embedded through their values in social structures.

The normative content of skill is especially evident in the consideration of work attitudes and dispositions as skills, but here the contradictions in the notion of value come to the surface. Should one value attitudes and dispositions at market prices; and, if not, how else? A curious example arises in the context of repetitive, dull or oppressive jobs. Is subservience to be regarded as a skill? Employees with monotonous working conditions are said to have “boredom coping skills”, which are positively associated with their well-being.³⁰ Yet while it is personally useful to be able to deal well with adversity, in situations of conflict the classification and valuation of skills becomes a feature of the conflict itself. The need for

²⁸ Himmelweit (1999).

²⁹ Rychen (2003).

³⁰ Game (2007)

coping is embedded in the employment relations and associated job design of particular workplaces. Policy implications might depend on which side you take: should one teach coping skills or resistance? The balance of power relations is important for the determination of the value of such attitudes as skills. Skills policy discourse unsurprisingly rarely debates the conflictual nature of skills determination, even though a suitable disposition is an acknowledged aspect of skill.

While social relations are inherent in value and hence in skill, the social determination of skill is additionally evident in another way. The acquisition of work skills is also inherently social. The work environment and community determine the purpose and effectiveness of the learning that takes place.³¹ The motivation to gain new skills depends on aspirations, expectations, social networks, and social and financial support, all of which impinge on the effective time discount rate which enters into any implicit calculation of benefit and cost. The acquisition of skill is like an investment, as the neoclassical framework tells us, in that resources are deployed in the present for future gain; but it should not be reduced to an individualistic calculation.

The “expandable” part of the PES concept may be the least contentious across all the social sciences: most accounts treat skill as something that can be acquired, or at least built upon. This is not to say that people are not differently endowed with talents, or with varying ability to learn new things, or that everyone can achieve any skill level provided that they trained enough. Yet some personal features with which people are variously endowed, and which help to generate value, are nevertheless largely fixed. An individual’s height might convey a labour market advantage, yet there is nothing in the way of training or other investments that can make you taller. Taller people can reap economic rents that cannot be competed away through the investments of shorter people. Yet I prefer not to include height within the definition of skill, since neither individual nor public policy can do anything to make an individual taller, even assuming that one would want to in the first place. Other personal but non-expandable features of value can be imagined too. Nevertheless, few features are in practice excluded in this way from the PES notion of skill: most individual qualities, if one thinks about it, are amenable to enhancement.

³¹ Felstead et al. (2009).

Skill Typologies, Domains and Mismatches

The concept of skill has thus far been examined at its most general level. I now consider ways in which skill has been dissected and categorised, for the purpose of driving analysis and action. The dissection of skill has been an important feature of occupational psychology, notably through the idea of competence. Applied economic methodologies are also contributing greatly to our knowledge of the antecedents and effects of different skill types.

The different components of competence are likely to be acquired in varying ways, and from different sources and contexts – home, school, work and elsewhere. Formal education and training, for example, is the main generator of scientific knowledge; while work attitudes are moulded in multiple sites. An understanding of these different components is the bread and butter of human resource management.

The various ways in which skills are productive of value – their uses – yield other typologies. One important type is the domain of activity or job tasks in which the skill-type acts. Domains can be mapped at varying scales, with descriptions that summarise the complex functions involved in daily work. Such maps can resemble fractal graphs, where the description encompasses as much detail however far you drill down. Moreover, domain types are never pure single processes: even the simplest of tasks, such as the collection of garbage cans, involve multiple physical and mental faculties.

Several task domains are “generic”: they can be described and captured with indicators that are commensurate across a wide range of (though not necessarily all) occupations. IT tasks, requiring the use of generic IT skills, are a prominent modern example. In contrast, technical skills that are used in one or just a few types of occupation, cannot be described with general indicators. Technical skills in different occupations are commensurate only with regard to the extent to which they are built on general education, training or work experience. There are thus as many “occupation-specific” skills domains as there are occupations.

The significance of the various generic skills domains is that they may be supplied from differing sources and at different life stages, and that the drivers of changing skills demand may be affecting some skill domains more than others. Some domains have been more visible than others, owing to the social construction of skill. The domains may also have different

effects. The contemporary favoured typology is between cognitive, interactive and physical skills. “Cognitive skills” is the term applied to areas requiring thinking activities – reading, writing, problem-solving, numeracy, IT, learning new skills,³² and so on. “Interactive skills” covers all forms of communication (including most types of management activities, and horizontal communication with co-workers, clients and customers), and other activities needed to elicit cooperative working and engagement with customers and suppliers, including emotional and aesthetic labour.³³ “Physical skills” comprise forms of strength and dexterity.

Cutting across these generic domains are further typologies relevant to policy and analyses. Focusing on the economic question of who pays for, and who benefits from, employees acquiring skills, the distinction noted in the previous section between firm-specific and transferable skills is significant. Generic skills are, ipso facto, transferable, but occupation-specific skills may not be.

Focusing on the level of complexity involved, “basic skills” refer to the threshold level of cognitive skills needed for getting any job and for acquiring further skills. Though the threshold is not easy to define with precision, research evidence has demonstrated the importance of basic skills in the labour market.³⁴ At the other end of the complexity scale is the concept of “talent”, used to describe those with especially high skill. Though “talent” is rarely properly defined by those who would use this concept, it broadly characterises those qualities thought to be needed for leading the major private and public institutions of modern life, or for reaching the top in artistic or sporting arenas. Part of the problem, in respect of “talent”, is that it is commonly identified only by its outcome of brilliant achievement, leading analysts up a tautological cul-de-sac.

The significance of the distinction between “routine” and “non-routine” derives from the link between tasks (generic or occupation-specific) and new technologies. Routine activities are argued to be more likely to be programmable and hence displaced by computers, unlike non-routine and unpredictable types of activity.³⁵ Closely related, domains may also be categorised according to how easily they can be outsourced to cheaper production sites in

³² In education psychology “cognitive skills” are synonymous with learning skills. The concept of cognitive skills used here, in economics, and in the policy literature is broader.

³³ Emotional labour involves the use of one's own emotions, and processes to manipulate the emotions of others, while aesthetic labour is looking and sounding good, in both cases for the benefit of the employer (Steinberg and Figart, 1999; Warhurst and Nickson, 2007).

³⁴ McIntosh and Vignoles (2001).

³⁵ Autor et al. (2003).

developing countries.³⁶ These classifications have important implications for understanding the changing structures of employment and earnings in developed nations. Rendering them in practice is another matter.

All these skill typologies have considerable relevance for the analysis of how skills fit with the economic and social structure of modern societies. Other dichotomies found in the skills discourse are less functional because they have come to be defined in starkly inconsistent ways. One such is the idea of “core” and “non-core”, a loose concept sometimes used in policy contexts: these are said to comprise those generic skills required for employability, or for the needs of an organisation, or for life in general. Another typology to be avoided is the so-called distinction between “hard” and “soft” skills. Leaving aside the macho overtones to this terminology, the meaning of “soft” varies between referring to work attitudes and capturing interactive activities such as communication. Such activities and attitudes may be no more difficult to capture than many cognitive or detailed technical skills, and are found to have substantive outcomes. So “soft” cannot reasonably refer either to the precision of the indicators one might collect, or to their salience for social analysis.

A further advantage of the breadth of the PES concept is that it allows that, within each domain and overall, there can be a mismatch between job skill and the job-holder's own skill, a phenomenon with particular significance within heterodox economics, sociology and psychology. The consequence of mismatch can be lost productivity, lower pay and reduced well-being. Addressing such consequences has increasingly entered the radar of modern skills policies, so it is important to have a clear concept and taxonomy for skills mismatch:

Skills under-utilisation occurs where a worker has work-related skills not used (or used at too low a level) in the job. This phenomenon is loosely related to the concept of “overeducation”, where someone has achieved education at a level higher than needed to get the job they are doing.

A skills gap is the opposite case, where an employees' competence to do the job is called into question (typically by their managers). This phenomenon is relatively uncommon in cases where employers are free either to train or dismiss incompetent workers.³⁷

³⁶ Jensen and Kletzer (2010).

³⁷ In England, 7% of workers are judged by their managers to have a skills gap (UKCES, 2010: 60).

While the concept of skills gap applies to both worker and employer, a skills shortage vacancy is a mismatch phenomenon that applies to the employer: it describes the situation where a job vacancy is hard to fill because applicants lack needed skills.³⁸ Since vacancies depend on demand and rise and fall with the economic cycle, this concept is only a weak guide to whether there are any skills problems in an organisation or in a national economy.

More relevant for that purpose is the notion of a skills deficit, where the level of skills supplied and used is below the desirable level. A common practical guide to what the desirable level should be is not some absolute standard, but the level exhibited by similar organisations or economies. It is for this reason above all that policy advisers have a strong interest in the benchmarking that is made possible by inter-regional and international comparisons of skills. Unfortunately, direct measures of skills being rare, each nation's researchers usually benchmark educational achievements, which are not the same thing.³⁹

Conclusion

It might seem strange, to any new-comer to the topic, that “skill” is at once held to be a pivotal object for modern social and economic life, while also a concept with no consensus as to what exactly it refers to. Yet that is precisely the obstacle to scientific progress surrounding the skills discourse that this paper has attempted to address. We are dealing, in the case of skill, with a slippery concept. Its meanings range among writers from different disciplines, and among common usages. The concept has also evolved with the changing economy. Half a century ago skill was reserved in policy discourse for technical qualities, usually in craft and related occupations, and had a distinctly manual overtone. In the “knowledge economy” its meaning is a great deal broader.⁴⁰ I will not be surprised if the PES concept of skill offends some scholars and practitioners in ways that I have not anticipated.

There seems little doubt that part of the reason for this lack of consensus is the segmentation of disciplines – economics, sociology and psychology – which have not been good at communicating with one another. Moreover, in each of these disciplines skill has assumed a

³⁸ This definition excludes vacancies that cannot be filled because of unattractive wages or working conditions.

³⁹ OECD's Programme for International Assessment of Adult Competences (PIAAC) is intended to fill this gap.

⁴⁰ Payne (2000).

very great importance, if for rather different reasons, so that discourse on skill is conducted with high stakes. In economics, skill is central to the story about the changing distribution of income. In sociology, skill underpins class, perhaps its most fundamental category, and is a crucial concept in the analysis of the labour process. In psychology, competence analysis is at the heart of important branches of human resource practice. In each of these disciplines there is a large and ongoing self-citing, inward-looking, literature. An additional reason for potential disagreement in public discourse is that the determination and valuation of skills lie in contested terrain. Multiple actors vying for advantage are likely to follow their own convenient definitions and analyses.

It might be suggested that the concept of skill that I advocate here involves conceptual evolution from a purer and more classically rooted notion of skill, and that with such slippage comes a looser analysis. Yet set against this somewhat nostalgic viewpoint are the twin observations: that in practice “skill” has acquired a much broader usage in common parlance, and in scholarly and policy discourse; and that the problematics of the “knowledge economy” and “skill-biased technological change”, and associated VET and labour market policies, necessitate a wider perspective. The need, then, is for a more encompassing approach to skill than a half-century ago, but one that is still conceptually precise.

The PES concept of skill set out in this paper may not be the only “right” concept of skill, and others will undoubtedly continue to think of skill in different terms even if in agreement with the arguments of this paper. My advocacy of the PES concept comes from the fact that it is broad enough for analysis of capitalist processes of skill formation and use, and of the possibilities for social action. It includes, for example, the dispositions and attitudes needed to ensure participation in the labour market. Yet at the same time it excludes qualities largely unrelated to the economic sphere of work, or which cannot be enhanced. All paid work activities entail qualities that potentially generate values; those qualities that can be expanded are treated as skills. This means that virtually no work should be called “unskilled”, since work almost always entails the exercise of qualities that have been enhanced. It is practical only to make distinctions along the spectrum between low-skilled and high-skilled work.

The definition also encompasses the central features of the concepts adopted by the three main social science disciplines that periodically debate these matters, namely economics, sociology and psychology. Each of these disciplines has contributed fundamental insights on skill but none on their own are up to the tasks being set for skills in modern economies. The

mainstream neoclassical economics approach is individualistic and does not incorporate the social determination of skill. The sociological approach emphasises complexity as being the real content of skill but has never fully successfully defined it, is generally though not always reluctant to measure it, and through social construction theory only partially develops skill's association with value. Psychology, by contrast, is keen on measuring and categorising skills, even though it uses other terms, but approaches their valuation through a focus on inputs that would appear one-sided to economics. Yet it is for the purposes of promoting social and economic progress that virtually all of modern skills analyses and policies are conceived; and these need to be debated and improved using the best endeavours of several social sciences. The PES concept of skill is sufficiently broad and flexible to allow dialogue and engagement between disciplines without imposing an artificial veneer of theoretical convergence.

References

- Acemoglu, D. And Pischke, J.-S. (1999) 'The Structure of Wages and Investment in General Training', *Journal of Political Economy*, 107 (3), pp. 539-572.
- Adnett, N. and Davies, P. (2002) 'Education as a positional good: Implications for market-based reforms of state schooling', *British Journal of Educational Studies*, 50 (2), pp. 189-205.
- Ashton, D. and Green, F. (1996) *Education, Training and the Global Economy*. Cheltenham, Edward Elgar.
- Attewell, P. (1990) 'What Is Skill?', *Work and Occupations*, 17 (4), pp. 422-448.
- Autor, D. H., Levy, F. and Murnane, R.J. (2003) 'The Skill Content of Recent Technological Change: An Empirical Exploration', *Quarterly Journal of Economics*, 118 (4), pp. 1279-1233.
- Avineri, S. (1968) *The Social and Political Thought of Karl Marx*. Cambridge, Cambridge University Press.
- Becker, G.S. (1964) *Human Capital*. New York, National Bureau of Economic Research.
- Blanden, J., Gregg, P. and Macmillan, L. (2008) 'Accounting for Intergenerational Persistence: Non-Cognitive Skills, Ability and Education', *Economic Journal*, 117, C43-C60.
- Bowles, S. (1998) 'Endogenous preferences: The cultural consequences of markets and other economic institutions', *Journal of Economic Literature*, 36 (1), pp. 75-111.
- Bowles, S. and Gintis, H. (1976) *Schooling in Capitalist America*. London, Routledge and Kegan Paul.
- Bowles, S. and Gintis, H. (1988). 'Schooling in capitalist America: reply to our critics.' In *Bowles and Gintis Revisited*, edited by M. Cole, London, Falmer Press, pp. 235-245.
- Braverman, H. (1974). *Labor and monopoly capital*. New York, Monthly Review Press.
- Clarke, L. and Winch, C. (2006). 'A European skills framework? – but what are skills? Anglo-Saxon versus German concepts' *Journal of Education and Work*, 19 (3). pp. 255-269.
- Cockburn, C. (1983) *Brothers. Male dominance and social change*. London, Pluto Press.
- Doyal, L. and Gough, I. (1991). *A Theory of Human Need*. London, Macmillan.
- Felstead, A., Gallie, D., Green, F. and Zhou, Y. (2007) *Skills At Work, 1986 to 2006*. University of Oxford, SKOPE.
- Felstead, A., Fuller, A., Jewson, N. and Unwin, L. (2009) *Improving Working as Learning*. Abingdon, Routledge.
- Game, A.M. (2007) 'Workplace boredom coping: health, safety, and HR implications' *Personnel Review*, 36 (5-6), pp. 701-721.
- Green, F. (1992) 'On the political economy of skill in the advanced industrial nations' *Review of Political Economy*, 4 (4), pp. 413-435.
- Green, F. and Keese, M. Eds. (2011) *Job Tasks, Work Skills and the Labour Market*. Paris, OECD.
- Handel, M.J. (2008) *Measuring Job Content: Skills, Technology, and Management Practices*, Institute for Research on Poverty, Discussion Paper 1357-08.

- Hashimoto, M. (1982) 'Firm-specific human-capital as a shared investment', *American Economic Review*, 71 (3), pp. 475-482.
- Heckman, J. J. (2008) 'Schools, skills, and synapses', *Economic Inquiry*, 46 (3), pp. 289-324.
- Himmelweit, S. (1999) 'Caring Labor' *The Annals of the American Academy of Political and Social Science*, 561, pp. 27-38.
- Jensen, J.B. and Kletzer, L.G. (2010) 'Measuring Tradable Services and the Task Content of Offshorable Services Jobs' in *Labor in the New Economy*, edited by K. Abraham, M. Harper and J. Spletzer, University of Chicago Press.
- Lave, J. and Wenger, E. (1991) *Situated Learning. Legitimate peripheral participation*. Cambridge, Cambridge University Press.
- Mcintosh, S. and Vignoles, A. (2001) 'Measuring and assessing the impact of basic skills on labour market outcomes' *Oxford Economic Papers*, 53 (3) pp. 453-481.
- Martins, P.S. (2010) *Can Targeted, Non-Cognitive Skills Programs Improve Achievement? Evidence from EPI*, mimeo, paper presented at Institute of Education, October 2010
- Mincer, J. (1974) *Schooling, experience and earnings*. New York, NBER.
- National Research Council (2010) *A Database for a Changing Economy*. Washington, D.C., The National Academies Press.
- Oliver, J.M. and Turton, J.R. (1982) 'Is there a shortage of skilled labour?', *British Journal of Industrial Relations*, 20, pp. 195-200.
- Payne, J. (2000) 'The unbearable lightness of skill: the changing meaning of skill in UK policy discourses and some implications for education and training', *Journal of Education Policy*, 15 (3), pp. 353-369.
- Rychen, D.S. (2003) 'Key Competencies: Meeting important challenges in life' in *Key Competencies for a Successful Life and a Well-Functioning Society*, edited by D. S. Rychen and L. H. Salganik. Göttingen, Hogrefe and Huber, pp. 63-108.
- Steinberg, R.J. (1990) 'Social Construction of Skill' *Work and Occupations*, 17 (4), pp. 449-482.
- Steinberg, R.J. and Figart, D.M. (1999) 'Emotional labor since The Managed Heart', *Annals of the American Academy of Political and Social Science*, 561, pp. 8-26.
- Stevens, M. (1994) 'An Investment Model for the Supply of Training by Employers', *The Economic Journal*, 104 (May), pp. 556-570.
- Stevens, M. (1999) 'Human Capital Theory and UK Vocational Training Policy' *Oxford Review of Economic Policy*, 15 (1), pp. 16-32.
- Tversky, A. and Kahnemann, D. (1986) 'Rational Choice and the Framing of Decisions', *Journal of Business*, 59 (4 (2)), S251-S278.
- UKCES (2010) *Skills for Jobs: Today and Tomorrow. Volume 2: The Evidence Report*. London, UK Commission for Employment and Skills.
- Wajcman, J. (1991) 'Patriarchy, Technology, and Conceptions of Skill', *Work and Occupations* 18 (1): pp. 29-45.
- Warhurst, C. and Nickson, D. (2007). "'Who's Got the Look?'" Emotional, Aesthetic and Sexualized Labour in Interactive Services', *Gender, Work and Organisation*, 16 (3), pp. 385-404.

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