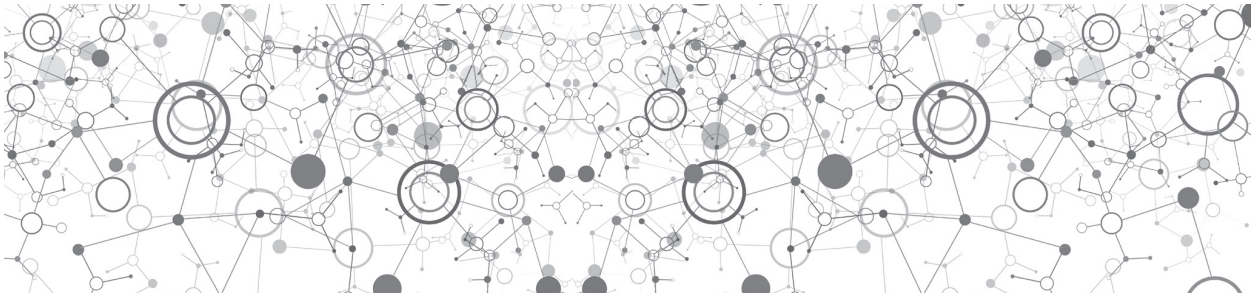


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Edited by  
David Scott  
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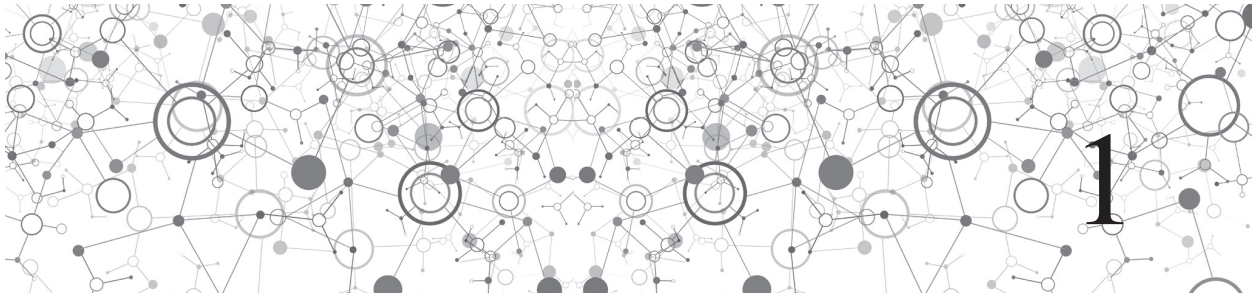
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# An Introduction and a Theory of Learning

David Scott and Eleanore Hargreaves

## INTRODUCTIONS AND THEORISATIONS

An introduction to a book is always problematic, and this is because it is difficult to be precise about its function. Should it be a critique, a summation, a framing, a landscaping or a cynosure? All of these have different purposes. A prolegomenic introduction, with due acknowledgement to Immanuel Kant (1997 [1783]), is a formal exposition of the concept or concepts to be discussed in the main body of the text (in Kant's case, the *Critique of Pure Reason* (2007 [1781]), and this has a critical component as to how this concept has been treated in the past. A summary suggests a synthesis of a number of different views of the subject matter of the book, without taking or advocating a preferred position. If this introduction were to serve exclusively as a framing device, then it would seek to position the body of work in its epistemic, social, spatial and temporal locales, to, in effect, historicise it. An introduction, however, can have more modest

aspirations, so that all it seeks to do is point to what there is in the main body of the work, and signpost where it can be found. Finally, an introduction may seek to make, or at least begin the process of making, sense of the central concept, drawing boundaries round the concept (it doesn't matter whether these are natural or manufactured, or even whether this distinction is credible), delineating between what it is and what it is not, and framing the concept, in this case learning, so that it can be used, modified, understood, genealogised and related to other concepts and ideas.

A history, exposition, delineation or explanation of an idea is always a contested activity. Whether we adopt a conventional view of narration or chronicling with its trans-historical subject and immersion in ordinary knowledge modes, or we seek to genealogise such a narrative or chronicle by subverting the naturalness of the categories and delineations in common-sense discourses (after all everyone knows what learning is), we still have to confront our own position as historian, genealogist,

expositor, academic or critic. In other words we still have to take account of the originary status of our viewpoint about knowledge, our epistemic position.

Our role here then, will be to uncover, or begin the process of deciphering, the rules (overt or hidden) that constitute particular framings of learning, without at the same time becoming embroiled in logocentric discourses that are underpinned by originary knowledge structures. To do otherwise would be to fall into the trap of what Foucault (1980) suggests is the 'illusion of formalisation', in which the chronicler seeks to explain types of knowledge in terms of a formal logic that transcends those knowledge constructions: a logocentric viewpoint. Foucault also urges us to avoid the illusion of doxa where appearances in relation to power are treated as opportunities to unmask them and replace them with more truthful versions of reality.

## REPRESENTATION AND EMERGENCE

A learning environment (or temporal and spatial locale for learning) has a number of constituents or elements. Two of these stand out. The first is the mode of representation of the entity that concerns us, and the second is the notion of change or how one situation emerges from another, both in relation to the individual and society. The first of these then is the representational principle. Something in nature, which we are pointing at, is convened as already known before it is represented in some medium or another. Heidegger (2002: 59), for example, suggested in relation to physics, that:

When, therefore, physics assumes an explicitly 'mathematical' form, what this means is the following: that through and for it, in an emphatic way, something is specified in advance as that which is already known.

These characteristics and constituents are not given in nature and then represented in an unmediated form in our descriptions of them. The essence of the object, in this case,

learning, cannot be read off from what exists in nature. There is a social dimension to knowledge-construction, but this does not eliminate the possibility of reference to a world that is separate from the way it is being described. Conceptual framings and sets of descriptors are constrained and enabled by the world or reality at the particular moment in time in which they are being used, and in turn, the constitution of the world is influenced by the types of knowledge that are being developed. Our conceptual frameworks, perspectives on the world, and descriptive languages, interpenetrate what we are calling reality to such an extent that it is impossible to conceive of a pre-schematised world (cf. Putnam, 2004). Thus representation, especially in its most fundamental sense, as in correspondent theories of truth, should always be understood as fallible, and even as potentially distorting.

This is the first point and it refers to the problem of representational knowledge. The second point when we are referring to learning essences is the issue of emergence. There are two forms that it can take. The first is ontological and the second is temporal. In the first case, emergence refers to the powers held by a person in their life-world. At the ontological level, reality is stratified and the properties of objects, including people, are emergent. This stratified reality includes level distinctions, which refer to the actual, the empirical and the real; and divisions in the intransitive world between, for example, the atomic, the molecular, the biological, the social and so forth (Bhaskar, 1989). The actual refers to things and events in their concrete historical contexts, only some of which will ever be known or experienced by human beings. The empirical is related to the actual, consisting of those phenomena that are experienced by people in the world. The actual and the empirical are both real, and consequently, are a part of the third domain. But the domain of the real also includes the structures of objects, for example, the relations between their constituent parts and the emergent properties to which their structuring gives rise. Since these powers of structures, when

exercised, may bring about certain effects, we can describe them as generative mechanisms.

In the second case, emergence is temporal. Social objects are structured in various ways, and because of this, they possess powers (cf. Brown et al., 2002). The powers of these structures (or mechanisms) are of three types. Powers can be possessed, exercised or actualised. Objects possess powers even if they are not triggered by external circumstances and combinations of other powers, and therefore they lie dormant. On the other hand, powers that have been exercised have been triggered and are now having an effect in an open system. Such powers are interacting with other powers of other mechanisms within their sphere of influence. Finally, powers that have been actualised are causally efficacious within the open system they are operating in, but in this case they have not been suppressed or counteracted. Embodied, institutional or discursive structures can be possessed and not exercised or actualised, possessed and exercised, or possessed and actualised. As a result, a causal model based on constant conjunctions is rejected and replaced by a generative-productive one, and objects and relations between objects have emergent properties, including discursive objects operating in the epistemological domain.

Consequently, if we are to describe the structures of a learning environment, we have to understand them as traces from the past, configurations in the present and projections into the future. In developing a theory of learning, we need to understand how the activity to which it refers is constituted. There are three alternatives, though they are not mutually exclusive. The first of these suggests that within the form of words we employ it is possible to establish reference points, so that the words themselves and the relations between these words refer to a learning process that de facto happened, but the one does not correspond to, or is not isomorphic with, the other. The second alternative is to suggest that the form of words we employ cannot represent the particularity, concreteness and materiality of an experience of learning; but, given that

we are now operating in a different medium, can provide a general account of a particular learning experience, which in turn can provide us with some understanding of the object, even if this is not definitive. However, this does not indicate or point to the existence of a causal relationship. There is a third possibility which is that the form of words which collectively constitute a theory of learning can also cause something to happen at the ontological level; this is the performative function of discourse. Learning, whether as a mental construct or material reality, is causally efficacious, that is, it potentially, but not necessarily, has the power to change what exists outwith it.

### **DELINEATIONS, BOUNDARIES, CLASSIFICATIONS**

Learning is conditioned by an arrangement of resources, including spatial and temporal elements. These arrangements are embodied, discursive, institutional, systemic or agential, and this has implications for the types of learning that can take place. Each learning episode has socio-historical roots. What is learnt in the first place is formed in society and outside the individual. It is shaped by the life that the person is leading. It is thus both externally and internally mediated, and the form taken is determined by whether the process is cognitive, affective, meta-cognitive, conative or expressive. Thus, learning has an internalisation element where what is formally external to the learner is interiorized by the learner and a performative element where what is formally internal to the learner is exteriorized by the learner in the world. Within this framework, behaviourists, complexity theorists, cultural-historical activity theorists, social constructivists, symbol-processing theorists, socio-cultural theorists of learning, actor network theorists and critical realists conceptualise the various elements of learning and the relations between them in different ways.

Wenger (2008), for example, and particularly in relation to classifications of the

concept, distinguishes between psychological and social theories of learning. In the first category he places behaviourist theories focusing on behaviour modification, cognitivist theories focusing on internal cognitive structures, constructivist theories focusing on building mental structures whilst interacting with an environment, and social interaction theories that focus on interactive processes but understand them from a primarily psychological perspective. In the second category there are a series of social theories of learning. These include activity theories such as cultural-historical activity frameworks, socialisation theories such as community of learning theories (cf. Wenger, 1998), and organisational theories that concern themselves both with the ways individuals learn in organisational contexts and with the ways in which organisations can be said to learn as organisations.

A theory of learning pivots on the idea that there is an entity called, for the sake of convenience, a human, and that this entity has a relationship (both inward and outward) with an environment (for some, this entails a post-humanising and materialising process (cf. Edwards, this volume)). A further complication is that any description of this process and set of relations further entails another and different set of actions and relations. In mapping or characterising the field, here we are concerned with epistemic differences between the range of theories presented, though these differences also focus, as I have already indicated, on the probative force and attached value we give to these relations and entities. Four examples of learning theory are examined here, behaviourist, phenomenological, constructivist and materialist, and these are differentiated by their epistemic relations.

## BEHAVIOURISM

Behaviourism is a philosophical theory and has been used specifically within the discipline of education to provide an explanation for the play of social and educational objects in

history. It makes three interrelated claims. The first of these is that if we are trying to understand the psychology of a human being, we shouldn't be concerned with what is in their mind but with how they behave. The second claim is that behaviours can be fully and comprehensively explained without recourse to any form of mental construct or event. The source of these behaviours is the environment and not the mind of the individual. And the third claim which behaviourists are likely to make and which follows from the first two claims is that if mental terms are used as descriptors then they should be replaced by behavioural terms or, at least, those mental constructs should be translated into behavioural descriptors. These three claims provide the foundations for three behaviourist sub-theories: a methodological theory of behaviourism, a psychological theory of behaviourism, and an analytical theory of behaviourism.

Methodological behaviourism has its origins in the sociological theory of positivism and the philosophical theory of empiricism, which can be understood as having the following characteristics: determinacy (there is a singular truth which can be known); rationality (there are no contradictory explanations); impersonality (the more objective and the less subjective the better); verificationism (the meaning of statements about human behaviours and their origins are understood in terms of observational or experimental data); and prediction (explanations of human behaviours are knowledge claims formulated as generalisations from which predictions can be made, and events and phenomena controlled). John Watson (1930: 11), one of the originators of behaviourism, in this vein wrote as follows in relation to the purposes of investigating human behaviour: 'to predict, given the stimulus, what reaction will take place; or, given the reaction, state what the situation or stimulus is that has caused the reaction'. Psychological behaviourism has its roots in British empiricism and in particular in the associational theory of David Hume. Observed or experimentally-induced associations allow the investigator to uncover causal structures on the basis of processes of



spatio-temporal contiguity, succession and constant conjunction. Learning is therefore understood as associational without recourse to mental states or events, with an emphasis on the reinforcement histories of subjects. For psychological behaviourists any reference to experiences (especially if couched in the language of mental states or events) should be replaced by observations of events in the environment; and references to thoughts, ideas, or schemata should be replaced by references to overt observable behaviours and responses to stimuli. Analytical behaviourism, whilst sharing many of the elements of methodological and psychological behaviourism, in addition, has the advantage that it avoids what has come to be known as substance dualism; that is, the belief that mental states take place in, and should be treated as separate from, non-physical mental substances, and yet are causally efficacious, especially with regards to events in the material world.

Behaviourism as a theory of learning then suffers from a number of misconceptions. Because of its strictures against immaterial mental substances, agents endowed with the capacity to operate outside of embodied, socially-derived or genetic causal impulses, reasons being conceived as causes of human behaviour, intentionality as a central element in any theory of human behaviour, and the internal conversation in learning (cf. Archer, 2007), behaviourism is now rarely thought of as a coherent or convincing theory of learning. A number of problems with it have been identified, and perhaps the most important of these is the claim that a theory of human learning is not sufficient unless reference is made to non-behavioural mental states, whether this is cognitive, representational or interpretive. In particular, this refers to the way an individual represents the world in relation to how they have done so in the past, and how this is conditioned by institutional, systemic, embodied and discursive structures; stories, narratives, arguments and chronologies; and structures of agency. For example, Michael Bratman (1999: 124) refers to the 'subjective normative authority for the agent'. This narrative agential

structure impacts on intentionality, and in particular on what constitutes a good reason for an agent to act; what, in short, gives that agent the subjective normative authority for their planned and intentional activity. A second reason for rejecting behaviourism is the existence of internal or inner processing activities. We feel, intuit, experience, and are aware of, our own inner mental states in the learning process. To reduce these phenomenal qualities to behaviours or dispositions to behave is to ignore the immediacy and instantaneous nature of those processes which condition learning. Finally, it is suggested that reducing learning to individual reinforcement histories is to develop an impoverished or incomplete theory, and consequently marginalise pre-existing structures, developed schemata, complex inner lives, prior representations, and structural enablements and constraints, which allow learning to take place.

## PHENOMENOLOGY

In contrast to behaviourist perspectives on learning are phenomenological approaches. Phenomenology is a meta-philosophy that focuses on the three key aspects of learning, the relationship of the individual to and with the world involving a process of change, the subsequent conception and activation of being in the world, and how our descriptions, words, schema, theories can provide us with some purchase on that world. The focus is on the givens of immediate experience and this is an attempt to capture that experience as it is lived, both by the individual themselves and the external observer. This knowledge-making activity is directed in the first instance to the things in themselves that are the objects of consciousness, and that try to find 'a first opening' (Merleau-Ponty, 1962 [1945]) on the world, free of those presuppositions that we bring to any learning setting. This entails a learning methodology which foregrounds subjective experiences and understands them in their own terms, both linguistically and

conceptually, whilst at the same time treating these two modes separately. This presupposes that the experience of others is accessible to us, even if with the greatest of difficulty. And this points to the break with behaviourism that phenomenologists generated. Whereas behaviourists were concerned above all with the behaviour of individuals and eschewed the inner workings of the mind, phenomenologists understand behaviour and consciousness as essential to any theory of learning. They are different aspects of the same phenomena; the world as it is lived by the individual and as it is known by that individual and others.

A variety of key terms are used by phenomenological meta-theorists. The first of these is a bracketing or suspending of our everyday understandings, beliefs and habitual modes of thought. This involves the bracketing out of our facticity (a belief in the factual characteristics of objects) and transferring our focus to our experience. This complements the epoché where we learn (through a process of change) to see (because this is more truthful) only what is given directly in consciousness. The phenomenological reduction then is this attempt to suspend self and other viewpoints and preconceived perspectives on the world.

A number of distinct phenomenological learning approaches have been developed: individualist, situated structural descriptive, dialogical and hermeneutic. The first of these, the individualist strand, comprises a process of introspection, where the learner assumes an external viewpoint towards him- or herself and tries to understand their experiences from this external perspective. The second of these is a situated structural descriptive or empirical approach to learning. Here the learner looks for commonalities in the many appearances of the phenomenon, which is the object of the investigation. Beliefs are understood in most circumstances as causes of behaviours. Dialogical phenomenology is a pedagogic approach, which prioritises personal and structural change delivered through bracketing and the epoché. Hermeneutic phenomenology is concerned with understanding texts, and, in the first instance, the learner seeks to understand

and acknowledge the implicit assumptions they make in relation to the text and their bracketing out of these presumptions (cf. Aldridge and Saevi in this volume).

## CONSTRUCTIVIST THEORIES OF LEARNING

In contrast to phenomenological perspectives, Jerome Bruner (1996) distinguishes between symbol-processing views of learning, which he rejects, and socio-cultural or constructivist views of learning. Typically he avoids taking up a position in which these two theories of learning are seen as polar opposites, so that if one position is advocated, any reference to the other is excluded. However, he does want to draw clear lines and boundaries between them. The first of these theories, the computational or symbol-processing view, conceptualises learning as a three-fold process of sorting, storing and retrieving coded information which has been received from an external source, and this mirrors the way a computer processes data. The mind is a tabula rasa, and learning comes from experience and perception. Information or data is inputted into the mind, and this consists of pre-digested facts about the world, which represent in a clear and unambiguous way how the world works. The theory of mind that this represents conceptualises each act of learning in input and output terms, and this assimilative process means that, as a result of the learning process, adjustments are made to the store of facts and theories that the person already holds, in the light of new information that the learner receives. This is a mechanistic process, and the notion of interpretation is subsequently reduced to the assimilation of new information and the reformulation of the mind-set of the learner. Learning is understood as a passive reflection of the world, with particular learning episodes being understood as more or less efficiently realised.

Symbol processing approaches have their origins in the philosophical theory of

empiricism, proponents of which understand the world as given and then received by individual minds. This theoretical framework separates out language from reality, mind from body and the individual from society (cf. Bredo, 1999). The first of these, the language-reality split suggests that facts can be collected about the world, which are atheoretic and separate from the belief systems of the collector. These facts are understood as true statements about the world. Furthermore, the theory of learning which emanates from this points to the need to discover what they are, and then develop appropriate models to explain them. The claim being made here is that language is a transparent medium and has the capacity to faithfully represent what is external to it. There is, however, a more appropriate solution to the problem of the relationship between mind and reality and this is that representations of reality are not given in a prior sense because of the nature of reality, or because the mind is constructed in a certain way, but as a result of individual human beings actively constructing and reconstructing that reality in conjunction with other human beings – some contemporary, some long since dead. This brings to the fore the dispute between constructivists and situated cognitivists, in that the former suggest that this active process of learning occurs in the mind, while the latter locate the process of categorising, classifying and framing the world in society and not in individual minds.

Symbol-processing approaches to cognition also suggest a further dualism, between mind and body. This separation of mind and body locates learning and cognition in the mind, as it passively receives from the bodily senses information that it then processes. The mind is conceived of as separate from the material body and from the environment in which the body is located. Learning is understood as a passive process of acquiring information from the environment. Socio-cultural theorists take issue with the supposed passivity of the process, and want to build into it active and transformative elements. There is a third dualism that critics of symbol-processing approaches have suggested is problematic. This is the

separation of the individual from society. If a learner is given a task to complete, they have to figure out for themselves what the problem is and how it can be solved. The task is framed by a set of social assumptions made by the teacher. The problem with the symbol-processing view is that an assumption is made that the task, and the way it can be solved, are understood in the same way by both learner and teacher. However, this is an assumption which shouldn't be made, and one of the consequences of making it is that the learner who then fails to solve the problem is considered to be inadequate in some specified way, rather than someone who has reconfigured or interpreted the problem in a way which is incongruent with that of the teacher or observer. The individual/civic distinction which is central to a symbol-processing view of cognition separates out individual mental operations from the construction of knowledge by communities of people and this leaves it incomplete as a theory of learning.

Winograd and Flores (1986: 73) suggest that the symbol-processing approach has the following characteristics:

At its simplest, the rationalistic (i.e. symbol-processing) view accepts the existence of an objective reality made up of things bearing properties and entering into relations. A cognitive being 'gathers information' about these things and builds up a 'mental model', which will be in some respects correct (a faithful representation of reality) and in other respects incorrect. Knowledge is a store-house of representations, which can be called upon for use in reasoning and which can be translated into language. Thinking is a process of manipulating representations.

This symbol-processing or computational view of learning can be compared with learning theories which foreground cultural aspects, situated or embedded in society. Situated-cognition or socio-cultural theories of learning view the person and the environment as mutually constructed and mutually constructing. As a result they stress active, transformative and relational dimensions to learning; indeed they understand learning as contextualised.

A particular iteration of social-cultural or constructivist theory is cultural-historical

activity theory. That we now have a three-generation model of cultural-historical activity theory is part of its formation as an established theory. This and each generation of activity theory can be understood in two distinct ways. The first is in terms of its historical trajectory, so we can understand Lev Vygotsky's (1978) theory of mediation as a reaction against what it emerged from, i.e. it sought to replace the stimulus-response model of the behaviourists because it became apparent that there were aporias, gaps, contradictions and muddles in the theory itself (the theory in short was inadequate); or it can be understood as an attempt to frame the concept as a universalising category. Both of these versions have meta-theoretical and thus universalising elements, in so far as the first requires a theory of history and the second requires a theory of social psychology. However, these universalising elements are framed in different ways.

The story then, replete with simplifications, is that the first generation of Cultural-Historical Activity Theory was inspired by Vygotsky, and as its centrepiece it had the well-known triangular model of subject, object and mediating artefact. When people engage in a learning activity (and in a sense this constitutes the principal activity of consciousness) they do so by interacting with the material world around them (though here the material world is embodied, structured and discursive). What they are doing is entering into a social practice, which is mediated by artefacts. This needs to be qualified in two ways: firstly, there cannot be an unmediated practice, so, for example, a discursive practice cannot be atheoretic; and secondly, as a consequence, we cannot have direct access to the practice itself; indeed, it is difficult to understand the idea of a practice which is separate from the way it is mediated for us. For Vygotsky, our contacts with people or the environment are mediated by artefacts, such as: physical tools, technologies, spatial and temporal properties of objects in the environment, language, number, picture, discourse structures, a division of labour, social norms, cognitive or affective schema, desires, wants or

fears (cf. Fenwick et al., 2011). This in turn led Vygotsky to a preoccupation with the notion of meaning and thus to the development of a notion of semiotic mediation and in particular to a rejection of the behaviourist paradigm, which posited a passive object-to-subject relationship (cf. Daniels and Chaiklin in this volume).

Learning can be seen as adaptive rather than transformative, and Vygotsky's work has always been associated with the latter rather than the former. However, the notions of adaptation and transformation are complex. The idea of adaptation would suggest that the learning conforms to those sets of behaviours, norms and strategies which constitute the social world, and which are external to the learner. The learner enters into a state of equilibrium, so that what is inside the mind of the learner (this changes) is now synchronised with what is outside the mind of the learner (which hasn't undergone any change at all). On the other hand, a transformative approach would suggest that both the mind of the learner and the object in the environment have changed. What this implies is not that one theory is misguided and should be replaced by another – a better account of a practice – but that we need to build into our theory the possibility that some learning is adaptive and some is transformative.

Four issues are of concern here. The first relates to whether meaning resides in the object itself or is created in conjunction with or through the interaction between subject and object. The second relates to the idealist tendencies in Vygotsky's thought (cf. Bakhurst, 2009). The third issue is that all these mediating devices are expected to work in the same way, even though they have different grammars and constitutions. And what follows from this, specifically in relation to learning, is that it is hard to believe that every interaction has an equal possibility of influencing and thus changing the zeitgeist or at least the learning environment. For Vygotsky the focus of his analysis was tool mediation and the activity system where these mediations occurred, rather than the individual per se. However, we

are suggesting here that this activity can be transformational both for the system (or learning environment) and for the individual, but not in every circumstance.

The second generation of cultural historical activity theory (cf. Engeström, 2001) is usually though not necessarily associated with the development of the original theory by Alexei Leontiev, and in particular, his elaboration of the concept of activity, so that a distinction is now drawn between an action and an activity. An action is said to be motivated by the intentionality of the person: the person has an object or objective in mind; an activity is understood as undertaken by a community and thus has some of the characteristics of that community, i.e. a division of labour, various means of production and so forth. Leontiev (1978: 10) explains his notion of activity in the following way:

In all its varied forms, the activity of the human individual is a system set within a system of social relations. ... Human activity is not a relation between a person and a society that confronts him. ... a person does not simply find external conditions to which he must adapt his activity, but, rather, these very social conditions bear within themselves the motives and goals of his activity, its means and modes.

This still leaves many unanswered questions about both the mind–world relation and the way both of these and the relationship between them is transformed.

Five principles underpin the third iteration of cultural-historical activity theory, and in its articulation we can discern its Marxist and Vygotskyian origins (Engeström, 2001: 136). The first principle is that the activity system is central to the process of learning; that activity system being collective, artefact-mediated, object-orientated and networked with other activity systems. This constitutes the primary focus of analysis. The second principle emphasises the way the activity system is stratified, historicised (traces of other human activity are present), and multiply-layered. The third principle is that activity systems are in a state of constant flux and thus are transformed as they

are shaped. The fourth principle is that a notion of contradiction is central to the transformation of the activity system. These contradictions are both internal and external to the activity system being examined, and, as Engeström (2001: 173) reminds us:

[they are] not the same as problems or conflicts. Contradictions are historically accumulating structural tensions within and between activity systems. ... Activities are open systems. When an activity system adopts a new element from the outside ... it often leads to an aggravated secondary contradiction where some old element ... collides with the new one. Such contradictions generate disturbances and conflicts, but also innovative attempts to change the activity.

Finally, the fifth principle suggests that activity systems move through long cycles of change, as the internal and external contradictions lead to and indeed cause individual and collective changes. This is what Engeström refers to as ‘expansive transformation’, and a full cycle ‘is the distance between the present day everyday actions of ... individuals and the historically new form of the societal activity that can be collectively generated as a solution to the double bind potential embedded in ... everyday actions’ (Engeström, 1987: 174).

An influential learning theory derived from, and with clear connections to, first generation socio-cultural activity theory is social constructivism. This is both a theory of mind as well as a theory of learning; so that learning is constructed in relation to and as a necessary element of the theory of mind that underpins it. In opposition to a belief in a mind-independent reality, strong social constructivists avoid epistemically-based commitments, and locate truth-forming mechanisms, justificatory rationales, and the means for determining that one type of knowledge is superior to another, in specific discursive formations, which have no external referents. What is being suggested here is that any truth claim comes from and indeed comes about as a result of agreements reached in society by influential and important individuals and groups of these individuals located in history; that is, what determines the validity of any argument about knowledge

is power arrangements in society. And what this means is that different knowledge claims where one claim is considered to be more true, more adequate or more reliable than another are not acceptable, nor are knowledge claims which are underpinned by metaphysics, rationality, logic, essentialism (in particular, an essential human nature) or even intuition (direct non-discursive access to the real – a Platonic position). Knowledge is developed through contestations and struggles in the past and in the present about the means for distinguishing true from false statements, and thus knowledge and those apparatus and technologies which act to legitimise it come about through the contingencies of history.

Social constructivists hold to a belief that representations of both physical and social objects are social constructs. So, for example, if an investigation is being undertaken into the issue of gender in educational settings, then a moderate social constructivist (in so far as they subscribe to some but not all of the ascribed characteristics of the belief system) would argue that it is only social actors' representations or conceptions of gender which are socially constructed. On the other hand, a strong social constructivist would assert that both the representations made by individuals and the referents of those representations, the actual entities to which these representations refer, are socially constructed. A moderate social constructivist would accept that reality (at the ontological level) can exert an influence on the way it is represented (at the epistemological level), though this is not isomorphic with, or a mirror image of, what it is meant to represent. A strong social constructivist would argue, in contrast, that what it is that is being represented is either fictitious or fabricated, and thus has no reality outside of, and external to, how it is represented. Some strong social constructivists go so far as to extend this extreme form of idealism to the physical world and the project of science (cf. Barnes et al., 1996).

Social realists argue for a position that separates out the nature of reality from its being socially constructed. In other words, an object

can be a social construction, or at least has been constructed in the past, and yet still be real, in that it exists as a social object regardless of whether a knower is engaged in the act of knowing it. Objects and relations between objects change their form. An example of this change process at the epistemological level is the invention (in so far as the set of concepts and relations between them is new) of the notion of probability (cf. Hacking, 1990, 2000) in the nineteenth century, and this changed the way social objects could be conceived and ultimately arranged. Change then can occur in four ways: contingent ontological, planned ontological, epistemically-driven ontological, and, in the transitive realm of knowledge, epistemological (cf. Scott, 2010). With regards to the example above, the invention of probability, two phases of change can be identified. The first is where knowledge is created and thus operates at the epistemological level – the new arrangement of knowledge. The second is where this knowledge has real effects at the ontological level, so that new arrangements, new formations, new assemblages come into being. This last is an example of epistemically-driven ontological change. The dilemma is that the social world, in contrast to the physical world, is always in a state of transition and flux, so that it is hard to argue that there are invariant laws by which the world works, at all times and in all places, except in a basic logical and rational sense.

Ian Hacking (2000: 20) has written extensively on the case for something to be thought of as socially constructed. He suggests that two conditions have to be met. The first of these is that '[i]n the present state of affairs, X is taken for granted; X appears to be inevitable' (2000: 20). However, the second is a necessary part of the equation: 'X need *not* have existed, or need *not* be at all as it is. X, or X as it is at present, is *not* determined by the nature of things; it is *not* inevitable' (2000: 20). Further to this, he suggests that the following claims are implied by the use of the term: 'X is quite bad as it is' (2000: 20); and '[w]e would be much better off if X were done away with, or at least radically transformed' (2000: 20). The point is that

if these embodied, institutional and discursive structures could be shown to be merely social constructions and thus arbitrary, then in principle they could be changed or amended. The problem then is that any replacements are also likely to be arbitrary, given that their justification is of the same type and has the same status.

Constructivism is a theory of knowledge, and it is also a theory of learning. In support of this, Ernst von Glasersfeld (1988: 83) has argued that knowledge is not and cannot be passively received but involves an active process that is coordinated by the learner, the cognising subject. This cognition is adaptive to the experiential world, and is a qualitatively different activity from discovering 'an objective ontological reality' (von Glasersfeld, 1988: 83). A distinction needs to be drawn between activities which generate understanding and those which lead to a repetition of behaviours. Thus, in contrast to behaviourism, we find out what is going on by inferring from the mind of the active subject rather than focusing on induced behaviours in the world. And, this has pedagogical implications. Von Glasersfeld (1988: 83) suggests that:

The teacher [should] try to maintain the view that students are attempting to make sense in their experiential world. Hence he or she will be interested in students' 'errors' and, indeed, in every instance where students deviate from the teacher's expected path because it is these deviations that throw light on how the students, at that point in their development, are organizing their experiential world.

## POST-HUMAN, ACTOR-NETWORK AND COMPLEXITY THEORIES OF LEARNING

What distinguishes a complexity theory of learning from conventional theories is the different foci of researchers and investigators, so that it is now the flows and relations between objects rather than the objects themselves which solicit our attention (cf. Davis and Sumara, 2006). Complexity theorists generally subscribe to a version of emergence, which we

described at the beginning of this essay as temporal emergence; society is characterised by notions of continuous emanation, flux and change, which though non-predictive, can be adequately captured in language. Objects in the world cannot be characterised by their essential qualities, but only through their interactions with other objects. Complexity resides in all these various interactions which produce new objects (characterised as different forms of structure), and results in a bewildering array of arrangements of material and human objects; and because they are difficult to characterise they rarely allow definitive accounts of what is going on to be produced. It is the complexity of these object-interactions and their subsequent and temporary coalescences that makes it difficult to provide complete descriptions of them. The epistemic level is unsynchronised with the ontological level because we have not developed sufficiently our instruments and conceptual schema for capturing something which is both ever-changing and has too many elements to it, i.e. it is too complex. However, this doesn't categorically rule out the possibility of providing more complete descriptions of events, structures, mechanisms and their relations in the world, and this suggests a notion of human fallibility which means that our actions (which correspond to learning episodes) are corrigible. The twin elements of complexity and temporal emergence (where systemic formations are understood as not incommensurable) cannot preclude correct descriptions being made of activities in the world, only that these elements can create considerable difficulties. This is further compounded by how emergence operates epistemically.

Many of these theorists go further than this (for example, Osberg and Biesta, 2007), and hold to a version of emergence in which there is a radical incommensurability between different formations over time (whether material, embodied or discursive). Furthermore, it is impossible to predict what inter-connections, new formations and iterations of the object-system will be realised because the principles of the new mechanism are not given in the

current arrangements. In other words, the relations between objects and the objects themselves, which make up activity systems, are not patterned in any meaningful sense; there is a radical incommensurability between these different iterations. What this also suggests is that any attempt to describe even the basic outline of the system and the way it works is incompatible with this idea of radical incommensurability. For example, the autopoietic principle (Maturana and Varela, 1987) cannot coexist with radical incommensurability and chaos theory. In a similar way, localism, historicity, holism, organisational necessity, complex causality, logical circularity, non-linear dynamics and uncertainty, positive feedback, self-organisation and inter-connected diversity, are all principles which pertain to and indeed define complex systems (Alhadeff-Jones, 2008); but which act to order our understanding of these complex systems and thus in part contradict the more important principles of radical incommensurability and chaos.

We are able to focus on the formations, but not on the way they were formed. This operates at the ontological level. In other words, though one formation, it is acknowledged, has emerged from a concatenation of others (prior to it in time), this process cannot be codified or captured symbolically (using words, numbers or pictures) except by using words such as chance, non-linearity, or non-predictability. However, each of these as we have already acknowledged is contested conceptually. Because something is non-predictable at the time it operates does not mean that it cannot be described after it has happened; a post-hoc theorisation of the object or arrangement. Non-linearity implies that the sequence of events we are concerned with here has not followed the accepted pattern, whether this has been deduced from previous occurrences or from logical and normative investigations, i.e. what should happen if X is transformed into Y, if certain logical canons are adhered to. Chance by virtue of what it precludes an explanation of it. We might want to say here that it just happened (cf. Osberg in this volume).

Actor Network Theorists argue for a symmetry of human and non-human elements, which means that at the level of analysis they should be treated in the same way. This has the effect of marginalising the hermeneutic dimension of learning, and fits better a structuralist and materialist ontology. The intention is to understand history not as the outcomes of originary actions by individuals or collectivities of individuals, but as sets of material objects (human and non-human) coalescing and working together. It is the networks, confluences, collective action sets which produce the conditions of action. Fenwick and Edwards (2010: 9) suggest that:

Actor Network Theory's (ANT) unique contribution is first, to focus on the individual nodes holding these networks together, examining how these connections came about and what sustains them. These include negotiations, forces, resistances and exclusions, which are at play in these micro-interactions that eventually forge links. Second ... Actor Network Theory (ANT) accepts nothing as given, including 'humanity', 'the social', 'subjectivity', 'mind', 'the local', 'structures' and other categories common in educational analyses. What we usually take to be unitary objects with properties are understood as assemblages, built of heterogeneous human and non-human things, connected and mobilized to act together through a great deal of ongoing work.

What follows here is that the contents of these networks and the inevitability of flux and change as essential elements are likely to mean that our descriptions of them are incomplete and fragmentary. However, what applies to the networks and assemblages themselves and to the relations between them, also applies to the meta-theory itself. Thus we should understand notions of symmetry, translation, problematisation, intersement, immutable mobility, delegation, multiple-perspectivism and actor-networking as incomplete and undeveloped as we try to plot what is happening and what has happened.

Translation is the process by which entities come together to form networks, assemblages and the like. Fenwick et al. (2011: 98) explain that an entity 'is a loose way to refer to various things that can be entanglements of human



and non-human, including different kinds of material things and immaterial (conceptual, moral, virtual) things and actions, that are not pre-given, essentialised and defined'. The problem of symmetry is foregrounded here, as this does not allow different entities and therefore different networks to potentially have different effects because they have different grammars and different capacities to influence the internal and external relations of a network or assemblage. By forgoing boundary and capacity analysis, the investigator is left bereft of explanatory tools.

Actor network theorising cannot then, amount to an argument in favour of social patterning or systemic predictability. Actor network theorists have argued against treating those traditional educational constructs and forms, such as curriculum, learning, leadership, management, standards, etc., as stable, expressing their opposition to the conventional understandings of these terms by pointing to the emergent and unstable ontology of material, discursive and human objects, and the need to move away from prioritising intentionality and therefore human agency over other objects in the world. Determinism would imply in its strongest form that our thoughts, feelings and subsequent behaviours do not deviate from the impulses laid down in our genetic make-up or in customised knowledge within our bodies or in the social arrangements (i.e. embodied, discursive, agential, institutional and systemic) that constitute our lives. However, if we want to build in a notion of agency, then we have to believe that our cognitive and volitional capacities can operate without recourse to, and outside of, those causal impulses that come from these determining impulses. Furthermore, if we hold to a belief that our cognitive and volitional capacities are inextricably tied to our genetically-determined, embodied or socially-determined impulses, then it follows that our capacity to determine whether or not we are being deceived, i.e. our capacity to tell the truth or not about our fundamental belief in determinism, is thoroughly compromised. Agency therefore involves a set of activities

which are not caused or influenced by those impulses that emanate from our genetic, embodied or social beings; that is, they do not involve an affirmation or a negation of them or even a reaction against them.

By disprivileging the agential and giving it equal status to other objects, action network theorists are making a point about what happens in the world. They are implicitly if not explicitly arguing not just that as theorists they should foreground something other than human agency, i.e. the relations between different networks of human and non-human material objects, but that this gives us a better purchase on the world than theories which privilege an essentialised version of the human being and their relations.

All discussions of a person over time require some understanding of change; that is, the notion of change is built into the conception of human being that we are operating with. There is also the problem of persistence. If there was no cohering element between time moments, so that every moment entailed a change of person, we would not have a sense of personhood, which therefore has to include a notion of persistence over time, and, in addition, has a notion of emergence. And this is emergence understood in its two modes: as a temporal phenomenon and as a response to the stratified nature of reality.

This sense of agency, structured in different spatial and temporal ways, allows and conditions the various acts of learning. Charles Taylor (1989: 12) writes about this sense of agency and its differential structuring in the following way:

So autonomy has a central place in our understanding of respect. So much is generally agreed. Beyond this lie various rich pictures of human nature and our predicament, which offer reasons for this demand. These include, for instance, a notion of ourselves as disengaged subjects, breaking free from a comfortable but illusory sense of immersion in nature, and objectifying the world around us; or the Kantian picture of ourselves as pure rational agents; or the romantic picture . . . , where we understand ourselves in terms of organic metaphors and a concept of self-expression. As is well known the partisans of these different views are in sharp conflict with each other.

A theory of learning pivots on the idea that there is an entity called for the sake of convenience a human and that this entity has a relationship (both inward and outward) with an environment. Four theories, which give different emphases to these elements have been examined here: behaviourist, phenomenological, constructivist and materialist. In characterising the field, we have been concerned with epistemic differences between the principal theories of learning, and therefore inevitably these differences also focus on the strength, probative force and attached value we give to those relations and entities. This is the way the field is constructed. And this has implications for all the other issues discussed in this book: formative and summative modes of assessment, pedagogy and curriculum.

## REFERENCES

- Alhadeff-Jones, M. (2008) 'Three generations of complexity theories: nuances and ambiguities', *Educational Philosophy and Theory*, 40, 1: 66–82.
- Archer, M. (2007) *Making our Way through the World*, Cambridge: Cambridge University Press.
- Bakhurst, D. (2009) 'Reflections on activity theory', *Education Review*, 61, 2: 197–210.
- Barnes, B., Bloor, D. and Henry, J. (1996) 'Scientific knowledge: a sociological analysis', *Education Research*, 31, 445–57.
- Bhaskar, R. (1989) *Reclaiming Reality*, London: Verso.
- Bratman, M. E. (1999) *Faces of Intention*, Cambridge: Cambridge University Press.
- Bredo, E. (1999) 'Reconstructing educational psychology', in P. Murphy (ed.) *Learners, Learning and Assessment*, London, Sage Publications, 23–45.
- Brown, A., Fleetwood, S. and Roberts, J. (2002) *Critical Realism and Marxism*, London and New York: Routledge.
- Bruner, J. (1996) *The Culture of Education*, Cambridge, MA, Harvard University Press.
- Davis, B. and Sumara, D. J. (2006) *Complexity and Education: Inquiries into Learning, Teaching and Research*, Mahwah, NJ, Lawrence Erlbaum.
- Engeström, Y. (1987) *Learning by Expanding: An Activity-Theoretical Approach to Developmental Research*, Helsinki: Orienta-Konsultit.
- Engeström, Y. (2001) 'Expansive learning at work: toward an activity theoretical reconceptualization', *Journal of Education and Work*, 14, 1: 133–56.
- Fenwick, T. and Edwards, R. (2010) *Actor-Network Theory in Education*, London and New York, Routledge.
- Fenwick, T., Edwards, R. and Sawchuk, P. (2011) *Emerging Approaches to Educational Research*, London and New York: Routledge.
- Foucault, M. (1980) *Power/Knowledge*, Brighton, Harvester Press.
- Hacking, I. (1990) *The Taming of Chance*, Cambridge, MA, Harvard University Press.
- Hacking, I. (2000) *The Social Construction of What?* Cambridge, MA, Harvard University Press.
- Heidegger, M. (2002) *The Essence of Human Freedom: An Introduction to Philosophy*, Ted Sadler (trans.), London and New York, Continuum.
- Kant, I. (1977 [1783]) *Prolegomena to any Future Metaphysics That Will Be Able to Come Forward to Science*, London, Hackett Publishing Company.
- Kant, I. (2007 [1781]) *Critique of Pure Reason* (Penguin Modern Classics), London, Penguin.
- Leontiev, A. (1978) *Activity, Consciousness and Personality*, Englewood Cliffs, NJ, Prentice Hall.
- Maturana, H. and Varela, F. (1987) *The Tree of Knowledge: The Biological Roots of Human Understanding*, Boston, MA, Shambhala.
- Merleau-Ponty, M. (1962) [1945] *Phenomenology of Perception*, Colin Smith (trans.), New York: Humanities Press and London: Routledge.
- Osberg, D. and Biesta, G. (2007) 'Beyond presence: epistemological and pedagogical implications of strong emergence', *Interchange*, 38, 1: 31–51.
- Putnam, H. (2004) *The Collapse of the Fact/Value Dichotomy and Other Essays*, Cambridge, MA, Harvard University Press.
- Scott, D. (2010) *Education, Epistemology and Critical Realism*, London and New York, Routledge.
- Taylor, C. (1989) *Sources of the Self: The Making of the Modern Identity*, Cambridge MA, Harvard University Press.

- von Glasersfeld, E. (1988) 'The reluctance to change a way of thinking', *The Irish Journal of Psychology*, 9, 1: 83–90.
- Vygotsky, L. (1978) *Mind in Society: The Development of Higher Psychological Processes*, M. Cole, V. John-Steiner and S. Scribner (eds), Cambridge MA, Harvard University Press.
- Watson, J.B. (1930) *Behaviourism*, New York, W.W. Norton and Company Inc.
- Wenger, E. (1998) *Communities of Practice: Learning, Meaning, and Identity*, Cambridge, MA, Harvard University Press.
- Wenger, E. (2008) 'A Social Theory of Learning', in K. Illeris (ed.) *Contemporary Theories of Learning ... in their own words*, London and New York, Routledge.
- Winograd, T. and Flores, F. (1986) *Understanding Computers and Cognition*, Reading, MA Addison-Wesley.

