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POWER AND SOCIOCULTURAL THEORIES OF LEARNING

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The purpose of this chapter is to investigate various ways that power has been taken up in the learning sciences. I begin with a brief description of the more dominant, individualist cognitive theories prevalent in the learning sciences, and explain some of the limitations of cognitive theories in regards to studying issues of power. For the remainder of the chapter, I will describe six central themes of sociocultural theory, and show how researchers have investigated the relationship between power and learning via each of these themes. I will also point out the limits of sociocultural perspectives on power up to this point. By the end of the chapter, I hope readers will have a good sense of how sociocultural perspectives conceive of learning, and will be prepared to take on the broad issues that are raised by critical theories.

The dominant perspective in learning sciences research takes what Greeno (2006) calls the "individual cognitive" perspective. Research from this perspective focuses on individual minds, "knowledge structures" inside the mind that govern how knowledge is stored and how pieces of knowledge relate to one another, or processes of learning and knowing, such as reflection, problem-solving, representation and so on (Sawyer, 2006).

One of the major differences between the individual cognitive and the sociocultural perspectives is the treatment of context. Context is not dismissed within individual cognitive approaches; on the contrary, researchers think deeply about teaching processes, and technological or other tools that can help bring about learning. For cognitivists, context matters in that some supports for learning (i.e., teaching methods) function better than others, but once knowledge is established in the mind, context recedes in importance. In contrast, sociocultural perspectives treat context as inseparable from cognition.

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Individual cognitive perspectives are not well positioned to tackle power because power is fundamentally relational; it is not "in the head," it circulates among people and the objects in their environments. Cognitive approaches are also limited in the types of explanations they can offer for inequitable learning outcomes (e.g., widespread racialized, gendered and classed differences in academic attainment and achievement). When the study of the mind is the primary focus, and context is a secondary and receding support, socially situated relations of power disappear from view. For these reasons, scholars in the learning sciences who have worked to address power as an analytical category have generally built upon sociocultural perspectives, maintaining attention to context and relations among people.

Key Sociocultural Concepts

Learning theories that fall under the umbrella of "sociocultural theory"[1] have different names and terminology—such as situated learning, activity theory, distributed cognition, cultural psychology—and on the surface, they may not appear to have much in common. For example, situated learning theorizes learning as a shift in identity and participation within a community of practice (Lave & Wenger, 1991; Wenger, 1998), and explains the process by which an apprentice tailor gradually takes on the practices and identity of a master tailor. By contrast, form–function analysis (Saxe & Esmonde, 2005) looks at the way a person uses a cultural form, such as a number word, to serve a cognitive function like setting up a one-to-one correspondence when counting. The goal of analysis is to look at patterns of form–function relations within a collective practice. Both fall under the sociocultural umbrella, yet these two theories study events at different time-scales, and use different language to describe the events (learning vs. development, community of practice vs. collective practices).

Despite these differences, all sociocultural theories share some common elements (Cole, 1996; Daniels, 2008; Nasir & Hand, 2006; Wertsch, 1985). I will discuss the elements that are the most distinctive (i.e., elements that distinguish sociocultural theories from individual cognitive approaches), and those that are useful for analyses of power. Although there is substantial overlap between the following six points, separating them for the purpose of discussion makes the task more manageable.

1. Cultural artifacts (both tools and signs) mediate human activity. This means that artifacts form an inextricable part of human cognition (rather than bearing some kind of causal relationship with cognition).
2. Learning should be studied as it occurs in everyday life, not just in the laboratory.

3. As people cross boundaries between different contexts, their learning both endures and shifts. Therefore, the unit of analysis for the study of learning goes beyond the individual and must include aspects of context.
4. Multiple historical timescales are relevant for the study of learning. Learning both endures and develops across time.
5. Learning should be studied using a genetic (developmental) method that allows insight into the process of learning, not just the outcomes.
6. As they participate in joint activity, people simultaneously exercise agency and are constrained.

I will describe each of the six themes in more detail, and include illustrative examples. Examples have been selected from a number of different sociocultural approaches, so the reader may enjoy the broad variety of voices and approaches within sociocultural theories. The six themes will also be used to explain how power has been addressed in sociocultural research. The agentic-constrained aspect of sociocultural theory is perhaps the most obvious link to the study of power. After all, what are agency and constraint, if not the exercise of power? Yet, the other themes also contribute to an understanding of power. Artifacts (including language systems, discourses, and ideologies) encode systems of power, and lend power to their users. Everyday contexts are replete with negotiations of power at a micro-scale, whereas historical analyses can make power visible at a macro-scale.

Mediation

Cultural artifacts (both tools and signs) mediate human activity. This means that artifacts form an inextricable part of human cognition (rather than bearing some kind of causal relationship with cognition). The concept of mediation is perhaps Vygotsky's most fundamental contribution to theories of learning. Mediation "extend[s] natural abilities through cultural means" (Holland & Lachicotte Jr., 2007, p. 110). Mediation occurs when an artifact[2] is drawn in to a situation to alter the relationship between people and the world around them. Said another way, mediation occurs when "the individual actively modifies the . . . situation as a part of the process of responding to it" (Cole & Scribner, 1978, p. 14).

Vygotsky saw mediation as the key distinction between what he called "elementary" and "higher" psychological functions (Vygotsky, 1978). However, as Wertsch (1997) points out, "almost all human action is mediated action" (p. 25), and so today, learning scientists study primarily higher psychological functions and Vygotsky's distinction is not always germane to our research. Consider vision: while the elementary function of perception is always necessary (the eye taking in light and sending signals to the brain), even at very young ages people begin to see in concepts. Rather than seeing an assortment of colours, textures and light, we see furniture, people, text and other objects for which we have developed

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words. In other words, vision quickly becomes mediated by language, and is therefore a higher psychological function in school-age children and adults.

The vision example used above demonstrates that mediation through cultural tools and signs does not replace natural, unmediated action. Instead,

> . . . the incorporation of tools into the activity creates a new structural relation in which the cultural (mediated) and natural (unmediated) routes operate synergistically; through active attempts to appropriate their surroundings to their own goals, people incorporate auxiliary means (including, very significantly, other people) into their actions, giving rise to the distinctive, triadic relationship of subject-medium-object.
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> *(Cole, 1996, p. 119)*

Mediation blurs the sharp boundaries that cognitive theories of learning have placed between individuals and their environments. Recall that for individual cognitive perspectives, context affects cognition, but is not intrinsic to it. From a sociocultural perspective, when artifacts mediate human activity, they do some of the work of seeing, remembering and problem-solving. We use mediational means to think for us. Whereas cognitive theories see the individual as separate from the environment, sociocultural theories link the individual and mediational means in a dialectical relationship. The relationship is dialectical in the sense that while people act with and on mediational means, mediational means also act on people; the person, mediational means, and the situation are all transformed through mediated action.

Power and Mediation

Mediation provides a first point of contact with sociocultural theory's conceptions of power. Vygotsky's intent was to create a Marxist psychology, "to contribute to the historical project of forging a socialist society" (Packer, 2008, p. 18). Vygotsky's theory of mediation echoes Marx's historical materialism: "According to Marx, historical changes in society and material life produce changes in 'human nature' (consciousness and behaviour)" (Cole & Scribner, 1978, p. 7). Mediation, via tools and signs, is the process by which historical change is translated into changes in human psychology.

Mediation is not neutral. In fact, "mediational means are differentially imbued with power and authority" (Wertsch, 1997, p. 66). That is, different artifacts wield power in different ways. Consider the way "authoritative" or "formal" language connotes power in a courtroom, whereas street slang does not. (As will be discussed in more detail below, context matters: there are situations in which slang is more powerful than formal talk.)

In addition, the construction and dissemination of artifacts can be an expression of power; for one example, consider the development of curriculum standards

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and expectations. These artifacts determine which knowledge is validated by state educational systems, and wield considerable power over teachers and students. Further, "because material resources are always limited, discourse communities produce and struggle over cultural tools, resources, and identities (both within and across communities) that provide them access to . . . material goods" (Moje & Lewis, 2007, p. 17). In other words, influence over the dissemination of particular artifacts can be linked to other forms of power (e.g., material goods or wealth).

Learning in Everyday Life

Learning should be studied as it occurs in everyday life, not just in the laboratory. I will focus on two related arguments for the importance of studying learning in everyday contexts. The first leads directly from the foregoing discussion of higher psychological functions and mediation, and the second follows from situated learning theory.

Vygotsky (1978, 2012) demonstrated that higher psychological functions have their roots in social life. For example, a young child learns the meaning of a pointing gesture because of the way caregivers respond to the child's attempts to grasp something out of reach. The pointing gesture starts as a social act, and then becomes appropriated by the child over time. Everyday life, therefore, provides a necessary social backdrop in which to understand development.

In addition, since artifacts have both material and ideal histories, they gain what Cole (1996) calls a "residue of the activity of prior generations" (p. 110). They carry history into the present. Consider a shoe. A shoe has a material history (its shape and fit are related to past examples of shoes) and an ideal history (different kinds of shoes symbolize different activities or kinds of people). Artifacts' histories never fully determine how people use them, but these histories are always at play. (This will be discussed further in the section on agency and constraints.) The only way to see the residue of its history is by examining the use of the artifact in context.

Sociocultural theorists do not dispense entirely with laboratory studies; they merely note, as have qualitative methodologists (e.g., Mishler, 1991), that the laboratory, the research interview, the questionnaire, are all contexts. There is no such thing as a decontextualized piece of learning or knowledge.

The second set of arguments for the importance of studying learning in everyday life derives from situated learning theory. According to Lave and Wenger (1991), this theory conceptualized learning as fundamentally linked to identity: learning is "increasing participation in communities of practice" (p. 49) and identities are "long-term, living relations between persons and their place and participation in communities of practice," (p. 53). By this definition, learning can only be studied in the context of communities of practice, where such relations are made visible.

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The apprenticeship of Liberian tailors (Lave & Wenger, 1991) is one of the classic examples described in situated learning theory. Apprentice tailors participated in tailoring tasks from the first day of their apprenticeship, beginning with the simplest and least risky tasks. Over time, they took on more complex tasks until they became acknowledged masters. Their participation in the community of tailors changed over time in several ways, including the tasks they performed, and the rank and respect they were accorded. The community allowed some of the apprentice tailors to gradually become masters by providing opportunities to take on the skills required of masters.

In situated learning theory, learning is defined as a shift in participation; this definition implies that only those shifts in participation that are socially recognized count as learning. Knowledge, in a community of practice, is embodied and performed; it is what happens as one learns how to be recognized as a certain kind of person within a community (Daniels, 2008). One's behaviour cannot be recognized without other community members. Apprentice tailors cannot become masters, no matter what their skills or "in-the-head-knowledge," if they are not recognized as such by the other tailors. An apprentice tailor might in fact be highly competent at master-level tasks, but this learning is not relevant if it is not practiced and demonstrated within the community. According to the theory of situated learning, skills and knowledge are understood in relation to the process of becoming a kind of person, in relationship with co-participants.

The process of becoming is foregrounded in sociocultural studies that consider identity development. There are multiple different definitions of identity that circulate within sociocultural theory. For example, Nasir (2011) writes: "By identity I mean a sense of self, constructed from available social categories, taken up by individuals and ascribed by cultural groups and social settings" (p. 17). Holland and Lachicotte Jr. (2007) define identity similarly: "Identities are social and cultural products through which a person identifies the self-in-activity and learns, through the mediation of cultural resources, to manage and organize himself or herself to act in the name of an identity. Identities are personally significant, actively internalized, self-meanings" (p. 114). Others move away from definitions of identity that require an internalized sense of self, to include the ways people are identified by social others in interaction (Esmonde, Brodie, Dookie, & Takeuchi, 2009). Despite these differences, whether identity is defined primarily as an internal sense of self, or ascribed to us by others, identities are part of our social worlds and are never purely individual.

Identity is inextricably linked to context. In Lave and Wenger's original formulation, identity development is linked to a process of becoming a locally meaningful kind of person within a specific community of practice. Since people participate in multiple communities, they develop multiple identities (Wenger, 1998). Therefore, identities in sociocultural theory are "fluid and shift in relation to setting, salience, and local definitions and opportunities" (Nasir, 2011, p. 17).

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Power in Everyday Learning

The social recognition that is integral to situated learning represents one way in which power circulates within learning contexts. Power can be seen in the hierarchy of master and apprentice: masters assigned tasks to apprentices, not the other way around. Masters likely had more authority to define who joined the community, and who became recognized as a master.

From its earliest incarnation, situated learning theory has insisted that understanding power is fundamental to understanding learning. Lave and Wenger (1991) acknowledged "unequal relations of power must be included more systematically in our analysis. Hegemony over resources for learning and alienation from full participation are inherent in the shaping of the legitimacy and peripherality of participation in its historical realizations" (p. 42). They argued that there is no inherent power relationship that applies generally in all communities of practice, but that "any given attempt to analyze a form of learning through legitimate peripheral participation must involve analysis of the political and social organization of that form, its historical development, and the effects of both of these on sustained possibilities for learning" (p. 64).

Almost 30 years later, power remains under-theorized in the field. In particular, overt and explicit hierarchies in learning communities are much easier to study than implicit or unspoken hierarchies. For example, it is relatively simple to check whether women are explicitly barred from participating in a community of practice, or allowed to participate but only in marginal roles. However, the field lacks specific tools to make misogyny visible in communities or practices that place a higher value on masculinity than femininity despite vocal pronouncements that people of all genders are ostensibly equal participants (Curnow & Chan, 2016).

Units of Analysis

As people cross boundaries between different contexts, their learning both endures and shifts. Therefore, the unit of analysis[3] *for the study of learning goes beyond the individual and must include some aspects of context*. Vygotsky (2012) believed that other researchers of his day were wrong to analyze psychological systems by breaking them down into the smallest possible elements. He argued that this approach cannot be successful:

> It may be compared to the chemical analysis of water into hydrogen and oxygen, neither of which possesses the properties of the whole and each of which possesses properties not present in the whole. The student applying this method in looking for the explanation of some property of water—why it extinguishes fire, for example—will find to his surprise that hydrogen burns and oxygen sustains fire.
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> *(p. 4)*

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Rather than breaking human psychological functioning down into elements, Vygotsky argued that the analyst must search for the smallest possible unit that still retains properties of the whole. To analyze properties of water, it would be unhelpful to break water down into atoms of hydrogen and oxygen. Instead, Vygotsky contended that it would be more useful to break water down into molecules, which are the smallest possible units that retain the properties of water.

Vygotsky made this argument in the context of his study of the relationship between thought and language (sometimes translated as thinking and speech). Whereas other researchers might analyze thought and language as two separate elements, Vygotsky knew that he had to find a unit that retained the characteristics of both thinking and speech, and could demonstrate the shifting relationship between the two. For this purpose, he selected "word meaning" as the best unit of analysis. In other words, word meaning still contains elements of both thought (meaning) and language (word), but to break words down further, perhaps into syllables or sounds, would be too far. In later work, Vygotsky argued for other possible units of analysis, depending on the goal of research. He did not argue for a single unit of analysis for all studies of cognitive development—in fact, for other studies, he adopted other units of analysis (for a broader discussion of Vygotsky's various units of analysis, see Daniels, 2008).

Post-Vygotskian researchers agreed on the importance of selecting the proper unit of analysis, and always include some form of context within the unit. Theorists have argued that the unit of analysis for learning must go beyond the individual. This is not an esoteric theoretical point; ample empirical evidence demonstrates that human cognition is distributed across the people, artifacts and social relations in a given context (e.g., Cole, 1996; Guberman, 2004; Nasir, 2005; Saxe, 2012; Scribner, 1985a; Taylor, 2009; Varenne & McDermott, 1998). For example, in one study, high school basketball players were given two sets of mathematics problems: one set of school-like problems, and one set of problems contextualized within the practice of basketball. The players used different strategies for the two sets of problems, thus showing that cognition cannot be separated from context (Nasir, Hand, & Taylor, 2008).

Sociocultural theorists have proposed a number of different units of analysis for the study of learning and development. Situated learning theorists adopted the individual within a community of practice as unit of analysis. Distributed cognition has adopted the "cognitive system," which includes minds, people, social relationships and the artifacts they use, as unit of analysis (Hutchins, 2001; Pea, 1993). Wertsch (1997) proposed mediated action, or person acting with mediational means, as the unit of analysis.

The funds of knowledge approach (González, Moll, & Amanti, 2005) looks to households and communities as the unit of analysis when considering the strengths and resources that young people can bring to bear in education. Funds of knowledge are "the strategic and cultural resources . . . that households

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contain" (Vélez-Ibáñez & Greenberg, 2005, p. 47), also described as the "specific strategic bodies of essential information that households need to maintain their well-being" (p. 49). This approach pushes against the individualistic view of cognitive approaches, and also contrasts with the participation focus of some sociocultural theories. Rather than thinking only about the practices in which an individual participates, funds of knowledge reminds us that people have access to networks of friends, family and neighbors, and these networks provide access to a broad set of resources.

Cultural–historical activity theory (CHAT) proposed the "activity system" as the appropriate unit of analysis (Engeström, 1999). In CHAT, an activity system is centred around an object (roughly speaking, an overarching goal), and encompasses all the people, artifacts, social norms and relationships that interact towards that object. (For a discussion of the evolution of the "three generations" of CHAT over time, and possible future directions, see Engeström, 2008; Roth & Lee, 2007.) CHAT differs from individualist cognitive psychology in that people's intentions, goals and desires, along with the overarching motive of activity, are contained within the unit of analysis. Indeed, the unit of analysis also considers the historical and contemporary organization of labour and artifacts that support and constrain human activity. As Sannino, Daniels and Gutiérrez (2009) argue:

> This methodological innovation represents a challenge to traditional thinking in human and social sciences, which rely on deep-seated individualism and on views of society as an anonymous structure. Object-oriented and artifact-mediated activity as a unit of analysis retains the importance of subjectivity, while integrating it with cultural means and constraints that inescapably characterize human practices. In doing so, this unit of analysis integrates society into activity.
>
> *(pp. xiv–xv)*

More recently, third generation cultural–historical activity theory (CHAT) has expanded the unit of analysis to include "multiple interacting activity systems focused on a partially shared object" (Engeström, 2008, p. 307). This expanded focus lends itself well to considering issues of power.

Engeström (2000) provides a CHAT analysis of multiple interacting activity systems in relation to hospital medical care. The people involved included doctors (generalists and specialists), patients and families, with the general shared object of healing ill patients. Artifacts include medical charts and tests, medical equipment (e.g., stethoscopes, x-ray machines) and specialized language. The medical field follows formal and informal routines and rules that constrain the flow and interpretation of information, interactions among people and so on. All of these must be taken into account in order to understand how the activity system operates, and how it may change over time.

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This medical example illustrates five important principles of CHAT (as described in Engeström, 2001). The *first principle* is that the proper unit of analysis is a set of activity systems, with shared or overlapping objects, considered in relation to one another. For a study of patient care, the hospital activity system should be seen in relation to all the other activity systems involved in the general object of looking after the patient–specialist clinics, the family, the school. The *second principle* is multi-voicedness: activity systems comprise multiple people with different forms of participation. If one followed different actors within the hospital activity system, one would find a multitude of perspectives on the issues at hand. The *third principle* is historicity: "Activity systems take shape and get transformed over lengthy periods of time. Their problems and potentials can only be understood against their own history" (Engeström, 2001, p. 136). The hospital is the product of a long historical process of development, which can be seen in its artifacts, rules and community. The *fourth principle* is that contradictions within an activity system, or between activity systems, precipitate change. For example, contradiction arises when different medical teams (e.g., general care doctors, specialists) do not communicate adequately, thus compromising the object of effective patient care. The *fifth principle* is that activity systems change over time, in what Engeström calls "expansive transformation" (p. 137). CHAT has a history of design-oriented research, in which researchers work collaboratively with the community of an activity system to resolve contradictions and promote expansive learning—extending the boundaries of knowledge and creating something new. This is in contrast with many studies in the learning sciences, which are more concerned with reproductive learning (i.e., school pupils learning a set of discipline-specific knowledge that has been set out in advance).

Power and Units of Analysis

A unit of analysis that is capable of making power visible must extend beyond the individual to include social relations. CHAT is well positioned to consider the circulation of power within a single activity system, or across networks of activity systems. Within an activity system, power can be codified in rules that constrain activity, and hierarchical divisions of labour. Across multiple activity systems, power can be seen when there are conflicting aims with respect to a shared object; the family, for example, has limited power in relation to hospital policy. In particular, the sick or disabled patient is often quite constrained, and the values of the medical system are oriented towards narrow views of health and ability (for more, see Smagorinsky, Cole and Braga, this volume).

Still, there are limits to CHAT's analysis of power. CHAT does not have theoretical or analytic tools to allow for the study of broad systems of power. For example, racism is not an activity system. Racism may be embedded in

artifacts, rules, divisions of labour, and yet it transcends a single activity system or even a network of activity systems. While CHAT holds promise as a powerful way to consider how such systems of oppression play out at the level of the activity system, to do so, I believe we must look to other theories for the necessary analytic tools to discern interactions between activity systems and ideological underpinnings of larger social systems.

History

Multiple historical timescales are relevant for the study of learning. Learning both endures and develops across time. Vygotsky's historical materialism avowed that "because socially organized activities change in history, the human nature they produce is not a fixed category that can be described once and for all; it is a changing category" (Scribner, 1985b). He was concerned with relationships between development occurring at multiple timescales. Specifically, he was concerned with four levels or timescales of development: phylogenesis (biological evolution, on a species level), cultural history (the development of tools, signs, and practices), ontogenesis (the development of an individual person over the life-span) and microgenesis (moments of development for an individual) (Scribner, 1985b; Vygotsky, 2012).

All of these levels of development are inter-related, though not always in obvious ways. The development of human biological capacities (phylogenesis) has shaped cultural history (as just one example, in the artifacts we have developed to help us thrive), and sets the stage for both ontogenesis and microgenesis (e.g., via our capacity for tool and sign use). In return, phylogenesis is shaped directly by cultural history (changes we have made in our ecological niche affect the evolution of our biological capacities), and indirectly by ontogenesis and microgenesis (individual people's development affects which genes are passed along to the next generation).

Within the learning sciences, phylogeny is not often taken up explicitly. However, the other three levels of analysis continue to be of central concern to sociocultural approaches. Studies of micro- and ontogenesis are most prominent, but cultural history is often at least implicit in sociocultural analyses. For example, artifacts are conceptualized as both carriers of cultural history and influential in shaping cultural history (Cole, 1996). The changing nature of communities or cultural activities (i.e., cultural history) is seen as tightly connected to individual development (ontogenesis). For example, Rogoff (2003) studies how "people develop as they participate in and contribute to cultural activities that themselves develop with the involvement of people in successive generations" (p. 52). Note that from this perspective, history is studied at the level of the cultural activity. There is some consensus among sociocultural theorists that history is most useful and manageable when considered at the level of the practice, community or activity system.

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> Historical analyses must be focused on units of manageable size. If the unit is the individual or the individually constructed situation, history is reduced to ontogeny or biography. If the unit is the culture or the society, history becomes very general or endlessly complex. If a collective activity system is taken as the unit, history may become manageable, and yet it steps beyond the confines of individual biography.
>
> *(Engeström, 1999, p. 26)*

While limiting history to the level of activity system or collective practice makes the researcher's task more delimited and therefore tractable, it may prevent historical analyses of broader systems of oppression, as referenced in the critical theories addressed in the remaining chapters of the book. Limiting history to the activity system also frames historical analyses as the history of human objects (motives), and the practices that humans have developed to reach those objects. As Bang (this volume) explains, this limited frame of history automatically excludes human relations with other living beings and the natural world. Bang describes some of the negative outcomes of this human-centred history in the chapter on colonial and settler colonial studies, and indigenous ways of knowing.

Power and History

We have already discussed the ways in which artifacts carry history with them, and argued that the creation and dissemination of artifacts is linked to social relations of power. Enciso (2007) warns of the dangers of simple, linear and conflict-free versions of history: "too often in sociocultural research and practice, the language and imagery associated with meanings of history create the illusion of a unified, equitable, and accessible past" (p. 50). Enciso goes into more detail in a discussion of school curriculum as historical artifact:

> . . .without exception, the cultural artifacts, concepts, and forms of mediation circulating and brought into action for making meaning in U.S. schooling are associated with contemporary and historical forms of racism, sexism, heterosexism, and ableism. . . . troubling the meaning of history in sociocultural scholarship is vital to a more robust theory and practice of educational research.
>
> *(p. 51)*

To paraphrase, sociocultural scholars must consider the ways in which broad systems of power and oppression are embedded in the histories of mediational means. The same can be said for other aspects of activity systems: power can be analyzed in the histories of the rules, divisions of labour and communities, as well as in historical relations between activity systems.

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Genetic Method

Learning should be studied using a genetic (developmental) method that allows insight into the process of learning, not just the outcomes. Sociocultural theories follow Vygotsky's (1978) admonition that development is a process, and therefore our research methodologies must attend to development in process, rather than simply endpoints or stages of development. In his study of the development of word meaning, Vygotsky (2012) developed an experimental technique that he called double stimulation. I will explain this method with an example from Vygotsky's study of the relationship between thought and language. Recall that Vygotsky had selected "word meaning" as the appropriate unit of analysis. He needed a research methodology that would allow him to see word meaning during the process of development. If he had tried to study word meaning using conventional or familiar words, he could not guarantee that he would see new development; at least some of his study participants would begin the study already knowing the words he chose. Instead, he used the double stimulation method to investigate how children developed a meaning for a set of nonsense words that he invented for the experiment.

The method is called "double stimulation" because he provided two sets of stimuli for participants to use.[4] The primary stimulus was a set of blocks that varied by colour, shape, height and size. He labelled each one with a nonsense word, the secondary stimulus. The nonsense words captured a new concept for which there was no existing Russian word. For example, "lag" described objects that were both tall and large. Vygotksy's idea was to observe how the children used the secondary stimulus (the new words) to make meaning of the primary stimulus (the different kinds of blocks). With this experiment, Vygotsky investigated how children at different ages developed new concepts. While he could not study ontogenesis directly by this method, he used his data to make claims about how children's meaning-making processes developed as they aged.

The Change Lab has adopted a modified version of the double-stimulation method for research and design projects coming out of the Center for Activity Theory and Developmental Work Research (Engeström, 2007). The Change Lab works with activity systems (such as health care systems, or schools) to help them identify what is not working, and to promote expansive learning in which the system reorganizes itself to function better. The primary artifacts are videos, interviews and other tools to document the functioning of the activity systems. The secondary artifact is activity theory itself, which is used to help the participants organize their thinking. The researchers work with participants to help them analyze contradictions within their activity system and propose changes.

Another methodological approach devised to consider development-in-progress is Saxe's (1991) form–function analysis. Saxe investigates the relationships between

cultural forms and the cognitive functions they serve, at three distinct levels: micro-, onto- and sociogenesis. Cultural forms are tools and signs, artifacts that have historical meaning. Examples include currency (bills and coins), number words and number symbols. These forms do not inherently serve any particular function, but "in microgenetic activity, individuals turn forms . . . into numerical means in relation to their emerging goals" (Saxe & Esmonde, 2005, p. 210). For example, if a person wanted to find out the quantity of coins in front of them, they might use counting words and gestures (cultural forms) to create a numerical representation (function) of the value of the coins. Ontogenesis is the pattern of form–function relations as they shift over the lifespan. Sociogenesis is a pattern of changes in form–function relations at the community level.

It is important to note that form–function analysis always takes into account the overarching collective practice, because form–function relations do not remain static when considered across different collective practices. For example, Brazilian children who sold candy for a living used very different strategies when computing problems related to candy-selling, than when computing school-like mathematics problems (Saxe, 1991). To the researcher, the problems seemed to be mathematically identical, but the children's performance demonstrates how different these problems actually were. Same-ness is determined by the people operating within a collective practice, not by some outside objective measure.

Patterns of form–function relations at the micro-, onto- and sociogenetic levels are related, but the relationship is not static or unidirectional. After all, a person's history (ontogenesis) is made up of small moments (microgenesis), within the context of a broader community (sociogenesis). However, if a person solves a mathematical task in a particular way once, they may not do so again. Nor will the community necessarily adapt to a single person's solution method—and vice versa, a person does not necessarily do things in the accepted community way.

Power and Sociocultural Research Methodologies

The Change Lab's expansion of the double-stimulation method provides an interesting take on issues of power in research. As previously discussed, CHAT has some capacity for exposing issues of power, perhaps especially when analysis focuses on contradictions within and across activity systems. The Change Lab method is similar to participatory action research (PAR) (Cammarota & Fine, 2008; Tuck, Allen, Bacha, Morales, Quinter, Thompson, & Tuck, 2008); PAR is a methodology in which researchers work collaboratively and transparently with community members, to analyze and take action on issues of justice that are important to the community. In both PAR and Change Lab work, community members are co-researchers and expertise travels both ways: researchers share theoretical tools with the community and the community provides their deep knowledge of their shared activity system. Researchers and community members

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jointly study how to apply the theory to resolve problems identified by community members.

Form–function analysis can also be used to study relations of power. The framework has been adapted to consider identity development in relation to ethnic identity and broader systems of race (Nasir & Saxe, 2003). Nasir and Saxe argue for the value of a "cultural practice perspective on emerging tensions" between various kinds of identities; in the case of racialized minorities, tensions between "ethnic and school identities" (2003, p. 15). Their analysis showed ethnic and academic identities constructed at the micro-, onto- and sociogenetic levels, and pointed to tensions that developed for African American students between their ethnic identities and their school-based identities. This type of analysis is promising in that it centres a recurring problem in educational research aimed at equity: the difficulty of connecting the broad historical development of systems of oppression, and the moment-to-moment interactions in which people live. Further research in this area is needed.

Agency and Constraint

As they participate in joint activity, people simultaneously exercise agency and are constrained. Rather than taking an extreme view that individuals are completely free to act as they wish, or the opposite view that individuals exercise no agency, "a focus on mediated action and the cultural tools employed in it makes it possible to 'live in the middle' and to address the sociocultural situatedness of action, power, and authority" (Wertsch, 1997, p. 65). This middle view has already been apparent in our discussion of mediation, and of participation in communities of practice.

Mediation, by definition, demonstrates people's capacity to exercise agency by altering their situations.

> Vygotsky argued that, without semiotic mediation, people would be buffeted about by the stimuli they happened to encounter as they went about in the world. Instead, semiotic mediation provides the means for humans to control, organize, and resignify their own behavior.
>
> *(Holland & Lachicotte Jr., 2007, p. 115)*

Mediational means also constrain possibilities. Wertsch (1997) illustrated this point with an extended discussion of pole vaulting as mediated action. Undoubtedly, the pole allows the person to clear heights that would be impossible without it; however, the makeup of the pole (bamboo, aluminum, fibreglass) constrains how high the vaulter can go. And, to state the obvious, a vaulting pole is useful in only a limited set of circumstances.

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Power in Agency and Constraint

Power is made visible in the ways social relations between people enable some forms of agency, and constrain others. The tension between agency and constraint comes into focus in analyses of the historical development of communities of practice. One of the tasks of a community of practice is to reproduce itself over time; as a result, communities of practice may resist change. Paradoxically, the very nature of the process of legitimate peripheral participation encourages change, or newcomers would never become old-timers (Lave & Wenger, 1991). Reproduction actually requires change. Even in practices that seem relatively stable over time, "the relatively stable characteristics of these environments are in constant tension with the emergent goals and practices participants construct, which stretch and change over time and with other constraints" (Gutiérrez & Rogoff, 2003, p. 21).

Further constraint comes from the way participation is regulated within a community. As discussed earlier, learning and identity formation are embedded in social relations with others; shifts in participation (i.e., learning) require legitimation from social others within the community. Moreover, communities commonly place constraints on who is allowed to participate, and in which ways. These constraints often reflect social systems and categories like race, gender, and language use:

> These categories [ethnicity, race, and language use] have long-standing influences on the cultural practices in which people have the opportunity to participate, often yielding shared circumstances, practices, and beliefs that play important and varied roles for group members. People do not just choose to move in and out of different practices, taking on new and equal participation in cultural communities.
>
> *(Gutiérrez & Rogoff, 2003, p. 21)*

Patterns of participation and exclusion can echo broader societal norms (i.e., uphold kyriarchical[5] views), but they can also challenge them. This unpredictability reflects the loose connection between sociogenesis, ontogenesis and microgenesis: the community norms, and one's own past, always inform moment-to-moment participation, but they do not determine it.

One inspiration for the theoretical integration that is the goal of this book comes from the practice-based theory of identity developed by Holland, Lachicotte, Skinner and Cain (2001). This sociocultural theory of the relation between power, identity and learning draws from Vygotsky, Bourdieu and Foucault. Vygotsky contributes the importance of mediation; Holland et al. emphasize that mediation involves the interconnected actions of "assigning of meaning to an object or a behaviour" (2001, p. 36) and then placing that object or behaviour in the environment so as to influence physical or mental events. The authors

note that mediation takes place in, and is made meaningful in, a "locus of social activity, a place in the social world" (2001, p. 36); this point allowed them to draw similarities between activity theory and Bourdieu's (1977) concept of 'practice.' Both activity and practice represent "a third way to grasp social action, one that mediates between objectivism (environment) and subjectivism (person or group)" (Holland et al., 2001, p. 39).

Holland et al. (2001) also point out common ground between mediational means and Foucault's discourse theory, with its "cultural forms," which "affect and shape subjectivity" (p. 26). They argue:

> Discourse (or discursive) theory emphasizes many of the aspects of cultural resources that we discuss here, especially their existence as public forms and social tools. Discourses and their categories are like the artifacts that Cole describes. They originate outside their performers and are imposed upon people, through recurrent institutional treatments and within interaction, to the point that they become self-administered. Categories carry an association to those who use them and are subject to them—an association with power—as artifacts do an association with tasks and those who perform them.
>
> *(p. 62)*

The parallel between artifacts and discourses is used to highlight the way broad social systems and institutions get enacted in daily social interactions, through repeated encounters with material and symbolic artifacts. People always exercise agency, within the confines of participation in activity/practice, with the historically meaningful artifacts/discourses made available for use.

Figured worlds are "socially and culturally constructed realm[s] of interpretation in which particular characters and actors are recognized, significance is assigned to certain acts, and particular outcomes are valued over others" (Holland et al., 2001, p. 52). They are akin to Bourdieu's "field," which "closely parallels [the] notion of figured world" (Holland et al., 2001, p. 58). It can be useful to conceive figured worlds as setting a context in which people know what to expect and can improvise appropriate roles. For example, the figured world of "school" includes teacher and student characters, and anyone familiar with school will have a general sense of how people act there. Any given action takes meaning within its figured world; looking up a fact on the internet might be acceptable when sitting at home talking with friends, but not when taking a test in the classroom. In an abstract sense these may seem like "the same act," but in a socially meaningful sense, they are completely different.

Figured worlds, as an analytical framework, makes visible the collective construction and enactment of generalized storylines, and the actions that people take to appropriate or contest these storylines. For example, Holland and Eisenhart's (1990) ethnography of women's experiences in college demonstrates the possibilities and constraints of the college figured world. Holland and Eisenhart

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found that the college peer culture was organized primarily around romance, and both men and women built identities around attractiveness. In the college world of romance, it was simply not possible to opt out. A woman could completely reject the idea that she was only valuable if she could date an attractive man. However, she could not control how her actions were interpreted by others. Like it or not, she could not step off the "sexual auction block" (Holland et al., 2001, p. 144).

Critical and Sociocultural Theories

Throughout this review of treatments of power in sociocultural theories, I have focused mainly on the commonalities across the distinct theories. However, the examples have also illustrated some key differences between sociocultural theories. As we move into the rest of the book, and consider broader social theories rooted in various academic disciplines, it will be important to carefully compare each theory's underlying assumptions.

Sociocultural theories differ in what they sought to explain. Vygotsky (1978, 2012) studied higher psychological functions, and the relationship between learning and development. Other scholars have focused on participation (Lave & Wenger, 1991), cognitive development (Saxe, 1991), object-oriented activity (Engeström, 2001), identity (Holland et al., 2001; Nasir & Saxe, 2003) or mediated action (Wertsch, 1997). These concepts have a family resemblance, but differ in important ways.

Units of analysis also varied, from individuals acting with mediational means, to networks of activity systems with a shared object. On a related note, the time scales of analyses varied: from a moment of problem-solving, to years spent developing skills in a trade, to generations of historical change. Theories also differ in the degree to which they articulate the separability of person from environment, and the degree to which they focus on processes rather than objects (Sawyer, 2002).

And of course, scholars differ in their assessments of Vygotsky's original work, of the legitimacy of various sub-branches of sociocultural theory, and about whether or not these theories are commensurable. This chapter has represented my own view of the major principles of sociocultural theories, a view that has been shaped by my research interests and my engagement in the learning sciences community.

As others have pointed out before me, sociocultural theory is well positioned to consider broad issues of power and their relation to learning (e.g., John-Steiner, 1999). Yet, one of the enduring challenges of sociocultural analyses of learning has been to identify the relationship of broad systems of oppression (macro-level), with moment-to-moment interaction (micro-level) (Nasir & Hand, 2006). Sociocultural theories excel at the micro- and meso-levels of analysis, and offer fewer explanations of the macro-level (Lemke, 2001).

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Many sociocultural researchers who include macro-level analyses in their research have turned to critical theories for inspiration and for conceptual tools (e.g., Lewis, Enciso, & Moje, 2007). The field is richer for it, but there are difficulties in juxtaposing theories that were developed in different disciplines and to address different kinds of research questions. Critical theory can be a more powerful tool for sociocultural researchers if we understand the history of these theories, their underlying assumptions and their compatibility or incompatibility with sociocultural theory. Our goal in the next six chapters is to lay out six critical theories and provide sociocultural researchers with sufficient detail to decide, for themselves, whether and how critical theory can expand their work. In the concluding chapter, Angela N. Booker and I will discuss the promise, and the challenge, of integrating critical theories with sociocultural theories of learning.

Notes

1. Within the fields of the learning sciences, cultural psychology, and educational psychology, terminology is contested and the term "sociocultural theory" takes on different meanings. Here, I use it to refer to all theories of learning that are rooted in Vygotsky's work. These include cultural-historical activity theory, situated/situative learning, distributed cognition, practice-based theories of identity, and more. Daniels (2008) refers to these all as social theories of mind. There is no one term that is universally used to refer to this body of theories.
2. Vygotsky distinguished between material tools, which operate on the material world, and signs, which operate on the self. Currently, many sociocultural theorists use a single term (artifacts [Cole, 1996], mediational means [Wertsch, 1997], or cultural forms [Saxe, 2012]) and argue that all artifacts contain both material and symbolic aspects.
3. Some theorists use the term "unit of analysis," and some use "unit for analysis." In both cases, the intent is to match the unit to the problem being analyzed.
4. The procedure is difficult to understand purely from a description. In 2008, Paula Towsey re-enacted and video-recorded the original double-stimulation experiment described in *Thought and Language*. The video can be viewed at https://vimeo.com/10689139.
5. Kyriarchy is a term invented by Fiorenza (2009) to refer to intersectional oppressions based on race, class, gender, ability, sexuality and other systems of dominance.

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