

Index formation: Assembling knowledge and identity, on and off the rails

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“Scientific facts are like trains, they do not work off their rails. You can extend the rails and connect them but you cannot drive a locomotive through a field.”

Bruno Latour, *Give me a laboratory and I will raise the world*

ABSTRACT

Psychological approaches have traditionally taken knowledge and identity to be located in individuals as part of a mental core that underlies and even causes action in the world. In contrast, social practice theories as developed in sociology, anthropology, and psychology take action, or practice, to be primary, with individual or social structuring understood as a contingent outcome of embodied engagement. However, much of this latter work, by relying on images of social worlds as relatively bounded and stable, reintroduces some limitations of individualist psychological approaches. This paper attempts to move beyond such accounts by developing a view of knowledge and identity as contingent outcomes of the assembly of a network that extends broadly across space and time. It first develops an account of knowledge production as involving simultaneous work both to make ‘facts’ fit with phenomena and to assemble infrastructures to receive these facts. Second, it draws on data from a longitudinal ethnographic study of engineers-in-the-making to show that while there are multiple knowledge and identity practices that might potentially be relevant to the discipline, only some of these have the infrastructure in place to make them recognizably valued forms. The paper argues that by recognizing knowledge and interests as formed and framed within extensive networks, questions about access to powerful social practices can be shifted from individual capacities to the work of building networks, thus redirecting discussions of values in educational practices.

Summary

This paper explores the conference themes of knowledge, identity, and practice in relation to issues of how people gain access, or fail to gain access, to valued futures. Issues of access have long occupied those in psychology and the learning sciences, though the conversations are not always framed in precisely this way. But attempts to

understand and to promote learning can be seen ultimately to involve attempts to enable access to valued practices.

Psychological approaches have traditionally taken knowledge and identity to be located in individuals, part of a mental symbolic core that underlies and even causes action in the world. This mental core, ideally developed, can allow for maximum individual autonomy. The more fully formed one's knowledge structures, the more powerful (abstract, general) they are, allowing "intelligent action" (Vera and Simon, 1993) across the contingencies and surface appearances of local situations. The more fully formed one's self or identity, the more they are freed from undue external influences, such as those from extrinsic motivations. Access to valued futures is gained by acquiring these powerful symbolic knowledge structures, which is often facilitated if one has the "right" kinds of interests or motives. Other approaches, more recent in their origins, have challenged the idea of a mental core that underlies action, arguing instead that useful knowledge originates in and always remains fundamentally situated in contexts. Knowledge, in this view, is fundamentally indexical (Barab and Roth, 2006; Brown, Collins, and Duguid, 1989), integrally connected to specific environments and realized in embodied practices with the semiotic and material resources of that context. This shift has led to questions about learning in terms of how people master these routine practices and how they develop identities as practitioners. Access to valued futures, in this view, comes from being socialized or enculturated into the practices of a community.

This paper, while accepting the basic premises of the situated perspective, argues that most such positions have adopted a limited view of indexicality, emphasizing stabilized indexical links, with little discussion of how these are produced or maintained, or of the role of researchers in this. In this paper, I draw on work that has suggests a more nuanced view of indexicality, of how knowledge and identities might become linked to contexts at different scales (Latour, 1983, 1987, 2006; Lemke, 2000; Nesper, 2004). In doing so, I draw on two main theoretical sources. The first is work in social studies of science and technology that shows how innovators like Pasteur (Latour, 1983, 1988) or Edison (Bazerman, 1999) *prepare the world* to receive their innovations. Such work has demonstrated that facts and technologies do not become widely adopted solely on the basis of any inherent 'truth' of the fact or internal quality of the technology. Rather, proponents *actively work* to have them accepted. Production of facts and technologies involves a process of what could be called "gap filling" (cf. Bartlett, 1958) between both ends of a trajectory from the laboratory or shop into the broader social world. That is, a Pasteur is *both* attempting to make possible facts fit with phenomena *and also* "preparing the world" to receive these facts, a process that results in changes – "translations," to use Latour's term – to both the fact and the world. That is, producing facts is not a matter of generating knowledge inside a laboratory that can then be applied outside the laboratory; rather, laboratories are *extended into* the world by negotiating the production of societal infrastructures—the "rails" without which the "train" of scientific facts cannot run (Latour, 1983, p. 155). In this view, knowledge is certainly indexical, but the indexical connections are contingently established through active work across time and space. At the same time, "interests" are not viewed as underlying motivators of action, but as actively produced as potential allies are "enrolled" (Latour, 1987) in extensions of scientific culture (Pickering, 1995; cf. Herrnstein Smith, 1988; Latour, 1987)

Similarly, in linguistic anthropology and related fields there has been a concern with the production of indexical connections through the circulation of forms across time and space. There has been explicit attention to how educational processes establish “associations between ‘educated’ and ‘uneducated,’ ‘sophisticated’ and ‘unsophisticated,’ ‘official’ and ‘vernacular’ language use and types of students” (Wortham, 2008), and with understanding how these associations move students on trajectories toward different social locations (Agha, 2007; Blommaert, 2005). Gaining access to valued futures is conceived in part as the gaining of *voice*, conceptualized as the capacity to accomplish communicative functions (Blommaert, 2005; cf. Bakhtin, 1981; Wertsch, 1991), a collective accomplishment that is not only a matter of reaching understanding in immediate circumstances, but also of controlling the meaning of communicative acts as they move across time and place. That is, voice requires the ability to make language forms durably interpretable in a certain way, a contingent and tension-laden process that involves forming connections to, becoming identified with and by, “centering institutions” (of which the laboratories mentioned above are one example).

The paper illustrates this perspective with data from a longitudinal ethnographic study of engineers-in-the-making, arguing that while there are multiple knowledge and identity practices that might potentially be relevant to the discipline, only some of these have the infrastructure in place to make them recognizably valued forms; without connecting to this infrastructure, students go “off the rails.” The paper argues that by recognizing knowledge and interests as formed and framed within extensive networks, questions about access to powerful social practices can be shifted from individual capacities to the work of building networks, thus redirecting discussions of values in educational practices.

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