Connecting Learning and Becoming: Studying Epistemologies and Identities as Interconnected, Dynamic Systems

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Abstract: This symposium brings together researchers from different countries, research disciplines and theoretical orientations, all of whom are engaged in the empirical study of connections between epistemologies and identities in educational settings. By comparing and contrasting their conceptions, methods and findings we seek to identify common themes and challenges, on the basis of which learning scientists might develop a more coordinated agenda for future research. Specifically, we propose to examine the timescales of processes studied, researchers' assumptions about the conceptual relations between epistemologies and identities, and the extent to which particular kinds of interaction between epistemologies and identities are local or universal.

Background

A growing body of research suggests that people's epistemological beliefs are related to their conceptions of themselves as individuals and as participants in communities (e.g., Gottlieb 2007; Herrenkohl & Mertl, 2011; Packer & Goicoechea, 2000; Wortham, 2006). However, the nature of these relations remains unclear. There are several reasons for this. First, few studies have focused explicitly on investigating the relations between identities and epistemologies. More often, evidence of such connections has been a byproduct of studies focused on other matters. Second, researchers of identity and epistemology come from a wide variety of disciplines and theoretical orientations, and rarely agree on operational definitions or methods of data collection and analysis. Accordingly, much of what research can currently tell us about how epistemologies and identities are related is either exceedingly vague or highly theory-laden.

The aim of this symposium is to begin an inter-disciplinary conversation about how learning scientists might study the relations between identity and epistemology in ways more conducive to building a body of cumulative knowledge and to guiding educational practice. We seek to do this by bringing together researchers from different countries, research disciplines and theoretical orientations, all of whom are engaged in the empirical study of connections between epistemologies and identities in educational settings. By comparing and contrasting conceptions, methods and findings from these different research programs, we hope to generate insights into common themes and challenges, on the basis of which learning scientists could develop a more coordinated agenda for future research.

Following outlines below of the four papers to be presented in the symposium, we suggest three themes on which the discussion might focus.

Heterogeneous Resources for Ontological Learning

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The social and natural worlds provide heterogeneous resources that contribute to learning and to pathways across which people are constituted. In order to account for the learning pathways that any individual travels, analysts must determine which configurations of resources become relevant in a given case. Out of the many resources that might be relevant to constituting an individual, a few generally become salient. We illustrate this contingent process by describing one young Mexican migrant in the U.S., sketching relevant aspects of family interactions, educational practices, local community characteristics and national discourses. This girl, her family, and other actors combine heterogeneous resources in contingent ways as they establish an emerging pathway across which she becomes a "good reader."

As established by significant bodies of work, learning is not just a matter of accumulating knowledge. Learning is ontological, in the sense that learners become different kinds of people as they learn. Just learning a certain type of knowledge or skill does not in itself determine the type of person a learner becomes, however. Across a pathway of events, people draw on various resources in constituting the learner as a person. What resources contribute to this constitution of persons through learning? How do we determine, in any given case, which of many potentially relevant resources are in fact crucial in constituting the person?

This paper addresses these questions, using an example of one immigrant girl ("Allie") as she becomes a "good reader." How do we know which of the various potentially relevant resources in fact contribute to Allie's emerging personhood as she becomes a good reader? In accounting for any focal object or process, like Allie becoming a good reader, many resources could be relevant. Many resources are potentially relevant to Allie's case. For example, over a timescale of two centuries Mexico and the United States have developed a complex, hierarchical relationship, which has led to migration policies and economic conditions that lead some Mexicans to risk traveling without documents, and this has yielded stereotypes of Mexicans as less likely to succeed. Over a timescale of two decades, recent Mexican migration to areas of the U.S. that have not traditionally been home to Latinos has yielded more flexibility for migrants, because longstanding residents unfamiliar with Latinos less often apply entrenched stereotypes and thus sometimes give immigrants more space for self-definition.

The town where Allie lives has a distinctive history of immigration, such that it is more welcoming toward immigrants than many others. Over a timescale of one decade, Allie's family has developed its own history of migration, and Allie's ontogenetic trajectory differs from that of many children in similar circumstances. It is relatively easy to imagine how these foregoing resources or processes might be relevant to Allie's personhood as she becomes a good reader. But many other potentially relevant resources exist. For example, Spanish and English differ in their grammatical encoding of motion. Given that Allie speaks English and Spanish, this might be relevant, but it does not in fact seem to account for important aspects of her social identification in the same way as the previous ones. How do we rule out such potentially relevant resources, determining that they do not in fact contribute to a focal process or phenomenon?

In this paper we draw on Silverstein (1992, 1993), Agha (2007), and Latour (2005) to answer this question. Silverstein (1993) and Agha (2007) provide general accounts of how relevant context is established for social identification within and across events, as people mobilize heterogeneous resources from various scales by deploying signs that point to relevant context and help constitute some focal object or process. Latour (2005) complements this account in useful ways, providing a comprehensive account of how heterogeneous resources in a network together make social identification and other processes possible. He argues that the social world is constructed out of heterogeneous "assemblages." For any focal phenomenon a "network" has been constructed, and this network is heterogeneous in both scale and type. Ideas, objects, and dispositions from different scales are brought together.

In Allie's case, as illustrated below, it matters that she grows up in a town of the New Latino Diaspora, where stances toward Latino migrants are less entrenched than in areas of traditional Latino settlement. It also matters that she is Mexican and not some other nationality, because of the history of Mexican migrants in the U.S. over the past century and associated models of Mexicanness. These two patterns, as well as others described below, form part of the network of heterogeneous resources relevant to constituting Allie's emerging personhood, despite the fact that they have themselves emerged over very different spatial and temporal scales (the New Latino Diaspora over the past twenty years and models of Mexicanness in the U.S. over at least two centuries). A network is also heterogeneous in type. Material objects matter, like the spatial and educational segregation of residents in Allie's town and the resources like books available to children from different groups. Ideas matter, like the models of personhood circulated in the media that represent Mexicans in certain ways. And embodied dispositions matter, like the pleasure Allie takes in reading a book and her facility in conversations about text.

In Allie's case, we argue that these particular resources are relevant to the person that she becomes as she learns to be a good reader, while many other potentially relevant ones (e.g., facts about English and Spanish verbs) are not. Latour argues that no particular process, scale, or resource is always relevant. Even though the New Latino Diaspora and the flexibility offered there is important to Allie, this particular context or resource will not be important to every Mexican student in Allie's town. Some of her peers travel pathways similar to those established by Latino children in areas of traditional Latino settlement. Social analysts should not "limit in advance the shape, size, heterogeneity, and combination of associations" in the network (Latour 2005:11). We must account for how, in a given case, a heterogeneous group of resources is assembled in a contingent way and becomes the relevant network to account for a focal process. In our case, the configuration of resources most salient for Allie forms a relatively distinctive network. Our job as analysts is to describe the network of resources that become relevant to a focal case or class of cases. Different cases will have somewhat different configurations of resources that account for the person that a learner is becoming. Analysts must avoid one-size-fits-all theories that limit relevant resources to only a few pre-established ones. We must instead do the detailed empirical work required to trace the networks of resources that matter in particular.

Disentangling Identity and Epistemology to Study How They're Connected

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Broadly speaking, an identity can be defined as the conception one has of oneself as a person. Under the influence of Erikson's seminal writings on the topic (e.g., Erikson, 1968), psychologists have traditionally conceived of identity development as a process of reconciling and choosing between competing self-descriptions. Individuals who have arrived at a coherent, integrated conception of self after a moratorium period of actively "trying on" and choosing between competing self-descriptions are considered to have achieved a mature identity. Those who have avoided such choices, or whose self-descriptions are inconsistent and unstable, are considered to possess foreclosed and diffuse identities, respectively (see, e.g., Marcia, 1966).

Whereas an identity is a conception one has of oneself as person, an epistemology is a conception one has of knowledge – what knowledge is, how it is acquired, and how it justified. Psychologists have conceived of epistemic development as a process of coordinating the objective and subjective aspects of knowing (see, e.g., Hofer & Pintrich, 1997; Kuhn, Cheney & Weinstock, 2000). At first, the objective dominates and all knowledge claims are assumed to be conclusively verifiable (absolutism). Subsequently, the subjective dominates and knowledge claims are treated as expressions of mere personal preference (multiplism). Finally, a balance is achieved in which neither aspect dominates and knowledge is seen as something that is constructed tentatively by evaluating evidence for and against competing points of view (evaluativism).

A growing body of evidence suggests that identity achievement is associated with evaluativism, moratorium with multiplism, and foreclosure with absolutism (see, e.g., Boyes & Chandler, 1992; Krettenauer, 2005). These associations make theoretical sense, for the reconciliation of competing self-descriptions can be seen as a special case of the general activity of reconciling competing points of view. On the basis of such connections, psychologists have proposed that epistemic development constrains identity formation. Yet the reverse might also or instead be true, namely, that identity formation constrains epistemic development.

I have presented elsewhere (e.g., Gottlieb, 2007; Gottlieb & Wineburg, 2012) various empirical examples in which a research participant's sense of himself as a person determined the epistemic stance he adopted to a given controversy or cognitive task. I presented one such case in an interview study I conducted in religious and secular schools in Israel to investigate how children and adolescents justify their religious beliefs (Gottlieb, 2007). In that study, I reported on the responses of Shlomo, a twelfth-grader at a religious school, to successive, differently formulated questions about whether his belief in God might be mistaken. His pattern of responses showed that, though he was keenly aware that God might, in fact, not exist, he was not prepared to admit that possibility – to the researcher or to himself. In a more recent study (Gottlieb & Wineburg, 2012), we presented additional cases of people's identities shaping their epistemologies. Specifically, we showed that even professors of history - who are highly trained readers of historical documents, and expert users of a variety of sophisticated epistemological tools to assess provenance and credibility - move with great ease and comfort between reading as a critical investigator and reading as a committed community member who considers critique inappropriate. In other words, in both these studies we found evidence of people adapting their epistemologies to fit their identities, rather than the other way around.

However, the question of how epistemic development and identity formation are related is not only an empirical question. It is a conceptual and methodological one too (cf. Chinn, Buckland & Samarapungavan, 2011; Greene, Azevedo & Torney-Purta, 2008). The extent to which these processes are found to overlap or constrain one another will depend on how each construct is defined and measured. Because many, commonly used measures (e.g., Harter, 1999; Marcia, 1966; Schraw, Bendixen, & Dunkle, 2002) were developed without connections between epistemology and identity explicitly in mind, they include several elements that are ambiguously situated in a gray area between epistemology and identity.

In this paper I review some of these instruments and pick out three causes for methodological concern: construct validity, a focus on the products of identity negotiation and epistemological reflection rather than on the processes thereof, and cultural insensitivity. I conclude with suggestions of how to address these concerns. In particular, I recommend methods that observe people engaging actively in identity negotiation and epistemological reflection as opposed to recording self-reports after the fact. In addition, I argue for measures that are comparative, not only across age groups but also across social contexts.

The Relationship between Expertise and Interest in Science Learning

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This presentation will make a case for a broad view of learning by building a model that addresses the interconnections between interest, identity, and expertise using the work of Holland, Skinner, Lachicotte, & Cain (1998) as a starting point. Building on my recent book (Herrenkohl & Mertl, 2011), two case studies will explore how this model plays out in one classroom of racially, ethnically, linguistically, and socioeconomically diverse fourth graders and their science teacher. Data collection took place in a public science{ XE "science" }

and technology magnet school situated in the poorest quadrant of a Northeastern US city. Approximately eight hundred children attended the school. As a neighborhood magnet school, it welcomed children who lived in the neighborhood and also served students from throughout the city as part of a voluntary de-isolation plan. In 35 classrooms from preschool through grade 6, about half of the students were children of color. About one quarter attended a Spanish bilingual program at the school. Approximately ninety percent of the students qualified for free or reduced lunch. At the time of the study the school had been in operation almost two years.

Data included videotapes and transcripts of classroom discussions in whole group and small group lessons as well as audiotapes and transcripts of interviews with students and the teacher. Each case study analyzes how a particular student interacted with others over time to improvise his or her own experience and contribute to the creation of the cultural resources within the classroom community. I trace how each student developed and refined interests, identities, motivations, affective orientations toward learning, and personal and social values about what is worth learning and if, how, and why one ought to put certain knowledge and skills into practice.

The two focal cases provide different entry points to understanding the relationship between identity and epistemological and conceptual expertise. Over the course of the study, Raul's confidence and ability to explain his ideas served as a basis for improvisation within new classroom values and practices. He was instrumental in creating joint understanding of key terms, epistemological practices, and concepts. He also took others' perspectives to help the class discuss conceptual and semantic sticking points. Christie, on the other hand, began the study lacking confidence and was in the bottom three questioners in the classroom, yet she experienced one of the most dramatic personal transformations. Over the course of the study, Christie went from assuming a defensive, resistant posture to a more confident engaged approach, developing stronger epistemological and conceptual understandings and developing a stronger identity as a capable student in science. These cases present a different view of how the "same" classroom was experienced for each student. Each student created, along with their other classmates and teacher, opportunities for students in the classroom to experience, own and exercise new ways of being, knowing, and doing science together as a class. Theoretical and practical implications of examining interest, identity, and expertise together to account for learning will be discussed.

Learning and Becoming in Practice: Constitution, and Learning to Be *Muisca*

Martin Packer and Martha Rocío Gonzalez, University of the Andes, Bogotá

In this presentation we will propose that the focus of ICLS 2014 on "learning and becoming" should be understood as a call to focus on *constitution*. Elsewhere we have argued that educational research in general can and should become a science of constitution (Packer, 2010), and the same argument applies to the Learning Sciences in particular.

Scientific explanation is generally assumed to take causal form, but in fact all sciences search for both causal explanations and *constitutive explanations*. The term "constitution" has become widely used in the social sciences but has rarely been defined with precision. We will build on recent work in the philosophy of science that has clarified the nature of constitutive explanation, as distinct from but equal to causal explanation. Causal explanations assume that two entities or events are independent of each other, that the cause precedes the effect in time, and that if the cause had not occurred the effect would not have occurred.

Constitutive explanations, in contrast, deal with entities or phenomena in which a whole is made up of parts, as a system with several levels of organization. Constitutive explanations answer questions about what something is, and how it comes to be. They account for the properties of phenomena by reference to the structures, or systems, in which they exist. The relationship between part and whole is a symmetrical and reversible relationship: a whole is constituted by the organized activities of its parts; a change in the parts is manifest as a change in the whole; and a change in the whole is also a change in some or all of its component parts.

Both natural sciences and social sciences ask (and answer) both kinds of question, causal and constitutive, but the role of constitutive questions has been largely ignored. Sometimes it has been suggested that causal accounts provide explanations while constitutive accounts provide only descriptions, but this is inaccurate: accounts of constitution are also explanations; they explain the characteristics of a phenomenon by describing a structure in virtue of which those capacities exist (Craver & Bechtel, 2007; Van der Smagt, 2006; Wendt, 1998).

For example, in a microwave oven high frequency electromagnetic radiation *causes* the water molecules in food to vibrate more rapidly. This vibration *constitutes* heat. The vibration is described on one, microscopic, level of observation and description, while heat is described on a second, more everyday, level. We explain their relationship when we say that "molecular vibration constitutes heat."

What, then, might be the form of constitutive explanations in the Learning Sciences, and what would be the consequences of a focus on constitution?

The Learning Sciences have been defined as the study of teaching, learning and development in settings outside the laboratory. When the influence of setting is treated as causal it is presumed that setting and psychology are separate; that there are human psychological characteristics upon which setting then operates. Setting is assumed to be the cause of variations among human psychological characteristics. When, however, we treat the role of context in human psychology as constitutive, we are suggesting that human psychological functions can be best understood as aspects of setting; that they would not exist if it were not for the setting, and that setting and psychology should be described as two separable levels.

We have argued that a sociocultural approach to educational research requires a nondualistic ontology: it must assume that a scientific study of 'the mental' as a material phenomenon is possible (Packer & Goicoechea, 2000). This follows the lead of Vygotsky, who based his proposal for a revolutionary new cultural-historical psychology on his diagnosis of dualism as the root of a crisis in the discipline of psychology, and argued that the way forward was to resolve this dualism by the radical move of cutting away idealistic approaches and advancing materialist approaches (Vygotsky, 1927/1997).

This amounts to what has been called a "radical realism," in which "there are not two worlds [mental and material] that must somehow be shown to be connected by the ingenuity of philosophers, but one: the subject is located in objective reality" (Bakhurst, 1991, p. 115-6). In this analysis, humans are enmeshed in a material and social world. Each of us is thrown into a world that predates our existence and that offers possible ways to be. By participating in a form of life we become skilled in the methods by which it is sustained, primarily through embodied expertise and *habitus*. Our primary way of understanding both ourselves and the entities we deal with is a practical grasp of the possibilities in social practices. In interaction with others - interaction that is fundamentally negotiated and improvised rather than governed by rules or roles - we continually renew the order of a form of life. One can distinguish, consequently, three interrelated aspects of constitution: the order of a form of life, the work of ordering by which that order is produced and reproduced, and the formation of the orderers, the participants who continually carry out this work.

We will illustrate these rather abstract points by describing a study currently undertaken by one of my students. The *Muisca* were the indigenous people living, when the Spanish conquistadors arrived, in a territory of 18,000 square miles centered on what is currently Bogotá, Colombia. They had an advanced civilization, with a confederation of states, an economy based on agriculture, mining, metalworking and manufacturing, and a sophisticated worldview. They have been declared a "lost civilization," their language "extinct." A 1943 census recorded only 525 surviving members.

Since 1989, however, a process of reconstruction of the Muisca people has been taking place. Key to this reconstruction is the creation of kindergartens in which children will learn again how to *be* Muisca. To study this process of constitution we are conducting research in one of the three kindergartens, documenting the educational practices in which the explicit focus is not only knowing but also becoming.

Any such educational curriculum faces a chicken and egg problem. How to bootstrap the recreation, the reconstitution, of a culture, a way of life, a way of being, that has largely been forgotten? Consequently, our project is a collaborative one: we are keen to avoid the risks and costs of colonialist research design; we intend that our findings will contribute to the ongoing design of instructional practices. The question, "¿Cómo ser Muisca?" ("How to be Muisca?"), is both our research question and the practical concern that guides everyday practice in the institution (an application of "Sacks' gloss"; Garfinkel & Wieder, 1970).

This might sound like a concern with "identity," but we consider this concept to be inappropriate for children of preschool age. Instead we are viewing kindergarten practices through the conceptual lens of a semiotic ontology (Kockelman, 2005; 2010), in which ontogenesis is a matter of deepening levels of semiosis: interpretation of signs as affordances, instruments, conventional actions, and enacted roles. Children learn the culturally appropriate ways to employ material artifacts (such as a drum), the sanctioned forms of action in conventional situations (such as a greeting), the rules and laws that govern enactment of a social status (such as elder), and so on. These are levels of residence, of a way of being in the world, that together constitute a modern Muisca.

Themes for Discussion

Three themes in particular seem to stand out as fruitful starting points for comparison between these studies. The first such theme is timescales. As Wortham and Rhodes note in their contribution above, there are many resources that are potentially relevant to making a person who she is. But to determine which of these resources is more or less crucial to her becoming who she is in particular, we need to consider her participation in processes of various timescales. In Wortham and Rhodes's study, these include processes of Mexican-US relations that take place over centuries and practices of segregation and differential allocation of resources that take place in a particular town over several years. In Herrenkohl's study, on the other hand, the timescale is a single school year, over the course of which different students respond differently to the "same" classroom resources and develop distinctive ways of being and knowing. To develop a more coordinated agenda for studying connections between identities and epistemologies, we need to ask ourselves which timescales are most

relevant to the kinds of learning we seek to foster, and which kinds of research design have greatest potential to elucidate interactions between learning and becoming that take place at different timescales.

A second theme is the conceptual relations between identities and epistemologies. Packer and Gonzalez appear to argue for a view of identities and epistemologies as constitutive of one another, or at least for the view that they are both aspects of what it means to participate in a particular form of life. Gottlieb, on the other hand, argues that epistemologies and identities are conceptually distinct. While he allows that, in practice, they are often related to one another in a variety of important ways, he insists that these relations are contingent rather than necessary. Neither Herrenkohl nor Wortham and Rhodes address these conceptual relations explicitly in their papers. However, the research questions they pursue and the ways in which they report their findings suggest that each of them considers the relations between identity and epistemology to combine elements of constitution with elements of causality. A more detailed elaboration of these positions and the identification of key areas of agreement and disagreement between them is another goal of the symposium. This discussion is unlikely to produce a common conceptual framework on which all learning scientists can agree. However, it should provide researchers with a more finely tuned vocabulary and an initial mapping of positions that can help set future studies of relations between identities and epistemologies on a more explicit and coherent conceptual footing.

A third theme is the local nature of identities and epistemologies, and the corresponding variety of interactions between them. Each of the papers in the symposium reports on empirical studies conducted in and around formal educational settings. Yet, each of these educational settings is itself situated within a distinctive cultural, linguistic and instructional ecology. Between Muisca kindergartens in Colombia, religious high schools in Israel, and ethnically diverse public schools on the east and west coasts of the United States, great differences exist in the language, traditions, and cultural expectations governing what it means to learn and to become a person. By discussing relations between identities and epistemologies against this backdrop of cultural diversity, we hope to gain insight into which features of these relations are local and culture-specific, and which features recur across cultures.

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