Science, Learning, Identity

Sociocultural and Cultural-Historical Perpectives

Wolff-Michael Roth and Kenneth Tobin (Eds.)

Science, Learning, Identity

NEW DIRECTIONS IN MATHEMATICS AND SCIENCE EDUCATION
Volume 7

Series Editors
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Scope

Mathematics and science education are in a state of change. Received models of teaching, curriculum, and researching in the two fields are adopting and developing new ways of thinking about how people of all ages know, learn, and develop. The recent literature in both fields includes contributions focusing on issues and using theoretical frames that were unthinkable a decade ago. For example, we see an increase in the use of conceptual and methodological tools from anthropology and semiotics to understand how different forms of knowledge are interconnected, how students learn, how textbooks are written, etcetera. Science and mathematics educators also have turned to issues such as identity and emotion as salient to the way in which people of all ages display and develop knowledge and skills. And they use dialectical or phenomenological approaches to answer ever arising questions about learning and development in science and mathematics.

The purpose of this series is to encourage the publication of books that are close to the cutting edge of both fields. The series aims at becoming a leader in providing refreshing and bold new work—rather than out-of-date reproductions of past states of the art—shaping both fields more than reproducing them, thereby closing the traditional gap that exists between journal articles and books in terms of their salience about what is new. The series is intended not only to foster books concerned with knowing, learning, and teaching in school but also with doing and learning mathematics and science across the whole lifespan (e.g., science in kindergarten; mathematics at work); and it is to be a vehicle for publishing books that fall between the two domains—such as when scientists learn about graphs and graphing as part of their work.

Science, Learning, Identity
Sociocultural and Cultural-Historical Perspectives

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PREFACE

This book about science, learning, and identity, as any book, is the result of a cultural-historical process that we, as any individuals, produce and are subjected to. Much in the same way that history is not made by individuals who act independently but by individuals who concretize cultural possibility, this book is not merely the outcome of two editors getting together and deciding to do it. Rather, there is a point in the cultural history of a field where realizing such a book that a particular concept becomes a general possibility, which is then realized in concrete form by particular scholars. Over the past seven or eight years, it has become increasingly apparent that the study of identity, which has had a decades-old history in other disciplines, also comes to be an important issue in science education. With this book, we introduce major ways of theorizing and studying identity and attendant issues that currently exist.

The book has three major objectives: (a) introduce science educators to the various dimensions of identity in science; (b) develop a new form of scholarship that is based on the dialogic nature of science as process and product; and (c) achieve the two previous objectives in a readable but scholarly way.

We have planned this book as both very readable and very articulate about all matters of identity concerning science, science education, science learning. We also designed this book as going beyond a simple collection of chapters that look more like journal articles with little connection between them. All through the production process, our concept has been to create a forum in which leading scholars present and interact over and about issues arising from the identity concept. To achieve this goal, we have brought together eleven chapters by leading scholars in the field, who combine an interest in both identity and sociocultural or cultural-historical perspectives. These scholars not only contribute a chapter but also engage in one or more interactive co-authored pieces in which the salient issues of the chapters are discussed. Grounded in different types of empirical situations, the contributors to this volume articulate aspects of identity and how these pertain to learning in science. To contravene a reductionist approach, which places questions such as those at the core of this book into the heads of individuals, the contributors frame the issue of identity in terms of sociocultural and cultural-historical theories.

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APORIAS OF IDENTITY IN SCIENCE

An Introduction

The literature over the past decade has shown that identity is increasingly becoming one of the core issues in the study of knowing and learning generally and knowing and learning in science specifically. Although it may appear that the question of "who" someone is can be answered easily, the notions of "self" and "identity" continues to be full of riddles (Mikhailov, 1980). The problematic nature of identity arises from the fact that there are at least two aspects to identity. On the one hand, a person appears to have a core identity, which undergoes developments that are articulated in autobiographical narratives of self. A thirty-year-old person can point to a photograph and say, "This is me at the age of five," and we recognize a resemblance; more so, anything the person says to have done provides us with resources to know who this person is, her identity. In this perspective, events in our lives may provide us with resources to understand ourselves differently, leading to changes in our biographies. This aspect has been articulated in terms of the narrative construction and reconstruction of Self, which is a function of the particular collective with which we identify. Second, in contrast to the contention of identity as a (relatively) stable phenomenon that is constructed in biographical narratives, the experience of the different ways in which we relate to others in the varying contexts of everyday life has led postmodern scholars to conceive of self in society as something frail, brittle, fractured, and fragmented (Giddens, 1991). In some situations, we feel powerless: observers and we might say that we are less powerful or attractive than others; in other situations, we are the focus of attention and wield a certain amount of power. Thus, from one setting to the next, our identities, as revealed by our transactions with others, change. We have to ask, "How can our identities simultaneously be continuous and discontinuous, context-independent and situated, stable and frail, or adaptive and brittle?" and "Why are there differences between the self in narratives and in ongoing, concrete daily life?"

The contributions to *Auto/biography and Auto/ethnography* (Roth, 2005) provide us with a first answer to this question, as they suggest a dialectical relationship between individual and collective. Thus, individual lives are concrete realizations of possible lives, where possibilities always exist at a collective level. More so, biographies and autobiographies never are singularities but both in content and form produce and reproduce culturally available contents and forms. If the content and form of a narrative truly were singular, they would be written in a private language, which constitutes an irresolvable contradiction—a completely personal lan-

guage would only be understood by the person speaking it and therefore would not constitute a language at all.

In the following, we articulate a general framework for approaching identity and human experience. This will allow us to better understand the relationship between identity, activity, and auto/biography, on the one hand, and provides a context for the different studies in this book, on the other hand. We begin with a phenomenological framing of the different problematic issues, aporias, that those face who attempt to come to grips with the phenomenon and concept of identity across a variety of human experiences. This framework contains several dialectical relations that—in turn—can be grounded in dialectical relations flesh, body, same, and other. This framework requires us to extend agential approaches to identity (and activity) to include passivity as an essential component at the very heart of agency. Similarly, at the very heart of identity is continuity over time, which is produced and maintained through memory and narrative, both of which have, in the same way as the general framework, the human communal experience (i.e., the *with*) as their fundamental condition of being.

CONDITIONS OF/FOR IDENTITY AND THE APORIAS OF BEING

Etymologically, the term *identity* derives from the Latin term *idem*, the same. *Identity*, therefore, means identical with itself, across time and space. But anyone looking back saying "this is me at the age of five" will recognize that she is different today, as a thirty-year-old, than she was twenty-five years earlier. The fragility of identity precisely is its difficult relation to time and the question, what is it that is the same? To get out of this aporia, or rather, to reframe it, the term *ipse* identity has been introduced (Ricœur, 2004), which draws on the semantic field of the same as *ipse*, *Self*. Whereas idem and idem identity refer to permanence in time, *ipse, Self*, does not imply such an unchanging core of a person (Ricœur, 1992). The two terms, idem and ipse are dialectically related, as at any one point in time, a person is identical with itself in terms of idem but is also a Self (ipse), with very different temporal properties. This temporal Self obtains its temporal cohesion, as shown below, in the form of auto/biographical narratives in which the uniqueness (identity) of a person is captured in a unique auto/biographical trajectory. This trajectory, as it will turn out, is not so unique, because narratives make use of language, plots, and characters that are cultural possibilities, and therefore also expresses a Self generally possible and available. The uniqueness is in part achieved in the dialectic of the Self and the material body, which is a source of passivity and being-affected.

A second moment of fragility of *identity* derives from its confrontation with others, or rather, with *the other* generally. The *same* thereby comes to be confronted with the *other than the same*, and, in fact, stands in a dialectical relation with it. The complex play of the same|other and oneself|another dialectics stands out quite clearly, for example, in the child who has lost a limb and comes to school with prostheses. Materially, these additions clearly are other than the body parts that they come to replace; clearly the body of the child has changed dramatically,
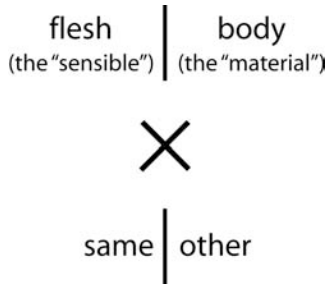
flesh | body
(the "sensible") | (the "material")

X

same | other

Figure 1. Identity involves the relation of two dialectical relations, flesh|body and same|other, leading to additional dialectical relations when one dialectical relation is conjugated to terms in another dialectic, and associated aporia.

which is perceptible especially when the artificial limbs have been taken off. But at the same time, the child can look back, remember the games played with the original leg, and, perhaps, the moment of the accident that damaged it. He can talk about *himself*, who he is, and, perhaps, how he has changed as a consequence of the trauma, all the while assuming that there is a constant element across the sequence of events: the *Self*. There therefore exists yet another dialectic, the one involving the person with senses, memory, and the material body that constitutes the substrate for the former (Franck, 1981).

All of these dialectics can be visually expressed in a simple schema, whereby a flesh|body dialectic comes to be conjugated and iterated with a same|other dialectic (Figure 1). The *flesh* is a phenomenological term denoting the body with all its sensual properties. Thus, whereas the *body* refers us to the mere material, the *flesh* refers us to the very possibility of being, agency, and passivity. The *flesh*, seat of agency and senses, is the mediator between Self and world. It is through the flesh that we are open and exposed to the world, the generalized other, subject to being affected and fashioned by the cultural and material life conditions: from the beginning, we are (in flesh) "subjected to a process of socialization of which individuation is itself a product, the singularity of the 'me' being forged in and through social relations" (Bourdieu, 1997, p. 161). The contradictory identity experiences described by Hwang and Roth (chapter 9) derive precisely from this openness to the world of the fleshly nature of the human Being, who can no longer (or not easily) make sense when physically moving from one cultural context into another. The very source of difference in physical experiences lies at the heart of the difficulties African American students experience, when their sense of rhythm, temporality, and proximity are confronted with the different forms of physical-material relations typical for the white middle-class culture that governs U.S. schools. The emotional-volitional and ethico-moral dimensions of identity Roth describes in chapter 8 also derive from the fact that the flesh constitutes a condition for human nature, Self, and identity. Without the experience of the flesh, itself the condition of the possibility to experience, there would not be emotionality or the intentionality it enables.

We may now conjugate each term of one dialectic with the opposing dialectic to yield dialectical relations that are at the heart of the troublesome nature of *identity*. For example, when we conjugate the *flesh* with the same|other dialectic, we obtain the mentioned oneself|another dialectic. This dialectic, which means that oneself and another presuppose each other, embodies some interesting features. Thus, to articulate but one of these, the Self forms in the image of the generalized other, it is a possible self within the context of the culture of the person, who concretely realizes one of these possible selves as her personal Self. Below, we further articulate how a Self is realized in this way in and through conversations about a person's auto/biography; this approach also is at the heart of Yew-Jin Lee's "A Beautiful Life" (chapter 12).

When the *body* is conjugated with the same|other dialectic, we arrive at the opposition between material bodies; it is this opposition that irrevocably separates each person from all other persons. It is the source of the unbridgeable otherness of other persons and the world. But it is also the condition for anything like human Being, which requires signs as a form of communication; and signs—sections of the material continuum [traces, sounds] standing for other sections of the material continuum [objects, events]—there would be nothing like cognition, knowing and learning. Without signs, there would be no memory, no culture, no learning from others, no human forms of society. This is the origin of the link between science, learning, and identity invoked in the title of our book. Phenomenologically speaking, the same–other distinction is made on some surface, for example, the skin, the locus where self and other rest in *proximity*. Not surprisingly, therefore, the notion of proximity has become central to those attempting to construct a *first* philosophy, that is, a philosophy that takes into account anthropogenesis, the coming into being and the emergence of everything that makes human nature possible, including the distinction between self and other, thinking, (cultural) learning, memory, and so forth.

AGENCY AND PASSIVITY AS SOURCES OF AND FOR IDENTITY

Most scholarship not only in science education but in many other disciplines as well focuses on agency at the expense of its correlate, passivity, which can be theorized such that it becomes the privileged attestation of otherness (Ricœur, 1992). This comes with a theoretical advantage in the sense that it leads to the agency|passivity dialectic, which decenters the self to the extent that it no longer serves as the exclusive anchor and foundation of identity. No longer, therefore, can the theoretical concept of identity be derived from intentionality, so that our identities no longer are at our will. We do not simply construct identities, but our identities emerge from the agency|passivity dialectic that grounds human nature as such.

The agential production of identity underlies much of the work conducted in the social sciences, including science education. Thus, for example, Nancy Brickhouse and Pamela Lottero (chapter 14) show how, through their forms of discourse, boys and girls *position themselves* in and during discussions of books in their book-club meetings. Maria Varelas and her colleagues, too, feature reading sessions, this time

in class, where students produce and reproduce particular identities. In both instances, the authors draw on the theoretical notion of *positioning* to theorize the ways in which individuals contribute to producing their identity. Similarly, Bryan Brown and Greg Kelly (chapter 13) show how minority students produce differentiated identities in and through their talk about the physics of baseball. Discourse also plays a role in Karen Tonso's account (chapter 5), in which she articulates the production of identity through the discursive assignment of individuals to particular categories (e.g., nerds, curve-breakers, brownnosers). The attribution may derive both from self-attribution and other-attribution. Although identity production involves discourse in all three cases, the third account differs from the two preceding ones. Whereas identity is produced and reproduced in and through talking about science in children's books and the physics of baseball in the former two instances—even without talking about it—it is the topic of talk in the Tonso study. In the former two instances, identity is a by-product of talk, whereas in the latter instance it is its main object.

An over reliance or exclusive use of agency as the source of identity—which is an approach that constructivism leads us to—leads us to an aporia: how does a constructing agent construct its own beginning? How does the conscious self, which is said to construct its identity, construct its own beginning? *Passivity* and *participation in social relations that precede consciousness* are the answer—both from the perspective of anthropogenesis (becoming human) and ontogenesis (becoming a person). Preceding anthropogenesis and the first instance of consciousness, pre-humans lived together, hunted together, used and learned to use tools together, related to each other, expressed affection to individuals and collective— the *with* is the condition for anything like human consciousness to emerge and exist (Nancy, 2000). Similarly, from the very moment they are born, babies participate in social relations even though they do not experience themselves as separate Beings and prior to any form of consciousness. In fact, parents change their behaviors (practices) as and because they interact with their babies, who therefore contribute to transforming cultural practices of child rearing prior to being conscious of themselves as separate Selfs.

Ultimately, then the world comes to be comprehensible, is immediately endowed with sense, because the incarnate person, with its senses and mind, has the capacity to be present in the world outside of itself. A simple experiment with the sense of touch provides us with evidence of this form of experience: sliding our fingers along some surface provides us with a sense of its characteristics, its roughness or smoothness, ripples and cracks. But these characteristics are not felt to be inside ourselves, and even less within our minds—we truly sense these characteristics to lie just outside of the skin of our fingers that slide along the surface. Precisely because the flesh is outside of itself in this way it is open to be impressed and lastingly modified by the (material, social) world (Bourdieu, 1997). At the very moment that we touch something, this something touches us in return, which we, shifting our attention to the sense of touch, experience on the inside of our skin.

MEMORY, NARRATIVE, IDENTITY

Bodies are singular; identities are not. Experiential trajectories of bodies and flesh are singular; accounts of trajectories are not. Narrative forms, language, and grammar are structures people draw on when providing accounts of who they are; and because these resources are general, existing at the collective level—from the other, for the other—they inherently embody and encode patterned ways in which auto/biographies and identities can be recounted. Each auto/biography therefore simultaneously is particular and general, singular and plural. This capacity to recount a life and therefore individual and collective memory, essentially derive from the relation of Self and Other (Franck, 1981); the social is the condition for temporality and the memory that bridges the distance between then and now.

Narrative forms (genres), too, are resources that can be transformed into new forms at the very moment that they reproduce an aspect of culture, producing and communicating narratives. When we talk to someone else about who some third person is, her identity, we presuppose that our interlocutor already understands the particular *type* of identity that our descriptions is to evoke. That is, biographical and identity narratives presuppose that the specific individual whose (auto-) biography is being articulated in the interview is a particular *type* of person. Biographical accounts and identity accounts are concrete realizations of presupposed, generally intelligible *plots* and *characters*. It is precisely this relationship between auto/biography and narrative in terms of plots and characters that undergirds the conversion experience from being an alcoholic to being a reformed alcoholic during membership in alcoholics anonymous groups. One is reformed and an accepted, core member of AA at the moment that one can tell one's life story in the form of the typical AA narrative form, its typical plot and characters (Lave & Wenger, 1991). Plots and characters, therefore, are cultural ways of organizing the memory necessary to maintain an auto/biography, individually and collectively. To know who someone is, we do not have to remember isolated bits and pieces of facts, but we remember plots and characters, which are filled with more specific details that make up the particulars of specific lives and identities.

Let us take a closer look at a concrete example. The simultaneous production and reproduction of culture, narrative genre, and language is exemplified in the following episode and analysis, drawing on a conversation between Michael (Roth) and a high school student, who later in the project became co-researcher and co-author (Roth & Alexander, 1997).

01 Michael: How do your parents combine that? Do they believe? Are they regular . . . ?
02 Todd: My mother is very similar to myself, she doesn't think about it as much as I do, because for her it is a difficult question and she was brought up not to think about it. Because she said, she was told that she was just a girl and girls don't answer such questions. And she is a very pacifist person, and she doesn't like that, the conflict. Neither do I, she doesn't like conflict and that's why she doesn't fight all that much. And therefore she– I mean she thinks about it now, and she combines the two. She also brought me up going to church. But very much also because she is the head of nursing, she's got a master's degree in nursing and studied a lot=

03 Michael: =at McMaster?
04 Todd: No she got her master's at U of T ((University of Toronto))=
05 Michael: =and she works at?
06 Todd: She teaches nursing at Sheridan College, and she's been head nurse in the hospital, very bright, very able she coulda been a doctor because she is a scientifically minded woman, who has very very strong beliefs very similar to mine, I mean, we disagree more on the social truths.

As part of a study concerning scientific and religious discourses, Todd and Michael have talked a lot about science and religion. Michael's opening question extends the conversation concerning Todd's acknowledged Christian faith to those he understood his parents to have. Their conversation follows a familiar pattern—see, for example, Lee's chapter 12—whereby the identities and biographies of individuals, such as scientists, are told in terms of their relations to, and influences from, parents and siblings. This type of plot, which we may gloss as "being influenced by parents and siblings and therefore becoming like them," constitutes a resource that has evolved as part of Western cultural history and is available to anybody a little familiar with biographical accounts in Western cultures.

In turn 02, Todd begins his response stating that his mother is very similar to him, but also different in that she does not think as much about the relationship between science and religion as he does. He defines her in terms of who he is, where he presupposes that his interlocutor knows who he is—a reasonable assumption given that at the two had known each other for several years in don|resident and teacher|student relationships. That is, Todd shares with his mother certain aspects, and thereby aspects of their identities are common. Yet there were differences as well. Thus, as Todd continues, he describes her biographical influences in terms of a familiar pattern: "Girls don't answer such questions" as the ones about the relationship between science and religion, especially if there are differences in the discourses of the two with respect to some subject. Here the relationship between the specific person, Todd's mother, and her taking the role of a character in a familiar *type* of plot is not just implicit but made the topic of talk. Todd continues with the discursive fitting of his mother's identity into familiar if not stereotypical character traits for a woman. She *is* a very pacifist person, a claim substantiated by the statement that she does not like conflict. Saying that his mother does not like conflict is already a generalization about the ways in which she goes about her everyday life. Saying that she is a pacifist generalizes one step further by actually using a cultural repertoire for characterizing and classifying individuals and, thereby, attributing particular forms of identity.

Todd does more in and with his response. Using language, he makes available his own subjectivity. Thus, he says that he is very similar to his mother. He experiences himself in the way he perceives his mother to be. That is, although Todd and Michael know that he is a unique individual, having his unique experiences, Todd articulates his subjectivity in terms of someone else—identity here is a character. At the very moment that he expresses his mother's or his own uniqueness, he transgresses the isolation of his personal experience, attributing both lives to a form

(type) of life and identity. Language is the means to do it. This language is not their own; it is already presupposed to be those of others. The language both interlocutors use more-or-less existed in the same form and was used when each was born. That is, at the very moment each interlocutor articulates his most private thoughts, questions, and experiences they have to make use of means that are not their own (Derrida, 1998). Our own subjectivities are intimately tied to intersubjectivity; we know ourselves only through our relationship with others, our Selves in fact or the Selves of others, a relationship Paul Ricœur captured in the title of a book, *Oneself as* Another.

The use and presupposition of general identities to develop who a person is continues in the next couple of turns. At the time of the interview, we are in Ontario. When I query Todd whether his mother went to McMaster University, it is not just a question about any university: McMaster University is well known beyond Canada for its medical and nursing faculties and facilities; its problem-based learning approach is a reference point both in the theoretical and practical literature on teaching and learning in the medical profession. Michael's query therefore can be understood as seeking to find out whether Todd's mother is an alumni of a particular university known for the outstanding quality of its program. In turn 06, Todd states that his mother has been a head nurse, which is yet another statement about her identity that draws on a particular *type*. He says and presupposes that his interlocutor understands that she *is* a head nurse rather than stating what she does on any concrete day.

The conversation as captured in the transcript is interesting because it also constructs the identity of a person, Todd's mother, by stating what she is not but what she could have been. At one point, Todd says that his mother is "very bright, very able. She coulda been a doctor because she is a scientifically minded woman." Here an attribute of her identity glossed as scientifically minded is made to work together with the potentiality of being a doctor, supported by the additional character attributions that she is "very bright, very able." The statement that his mother is scientifically minded is used as a resource to support the claim that she could have been someone else, a doctor. As long as the supporting statement itself is not questioned, this potentiality itself becomes an aspect of his mother's identity for the purposes of the ongoing activity.

Choosing a narrative framework, where (auto-) biographical materials are not just about specific persons but also about *types* of persons, we do not have to ponder questions of the truth between what people say and what really happened to them, about their real beliefs and what they say they believe. The discourse analytic framework drawn upon by the authors to Part D of this book allows us to see interview transcripts as establishing versions of the world, versions that have relevance in, and pertain to, the current situation. Different versions, different identities may be evident not only between different situations but also within a single situation, such as the same interview. Thus, all interviews with Todd and his classmates have to be seen in this perspective—participants were oriented to the production of an intelligible text about the nature of science, epistemology, learning, and religion. The interviewer and his interviewees were inherently responsible to one another for

producing each meeting and intelligible conversation, and in doing so, drew on culturally and historically available resources. As a result, both interview situation and interview text are concrete realizations of general possibilities—they are dialectical, constituting both particular instances and general cultural-historical possibilities.

There are several different levels of events that occur in this episode, all of which can be traced back to the dialectical nature of culture. First, Todd and Michael produce an interview; and they do so in a way that allows readers to recognize the event *as* an interview. The two participants know this as well as the readers although this particular event, recorded on videotape, is highly singular and occurred only once (in this form). Second, the two participants understand what the respective other is saying, even though they may never have heard a particular question or statement before. Thus, Todd has talked about his mother as having had the potential to become a doctor, the career that he envisioned for himself and eventually realized. In turn 01, Michael asks about how Todd's parents dealt with the issue currently the topic of talk. Todd has an immediate response, which is concerned with the similarities and differences between his mothers and own identity. Third, both Michael and Todd draw on a particular aspect of telling a biography—influence of parents: the latter volunteers information about the influence his mother has had on his going to church. But even at the very moment that one of the two interlocutors begins to draw on the family repertoire in auto/biographical accounts, he presupposes the possibility and intelligibility that family members may play a significant role in autobiographical accounts. The biographical nature of character and plot that are developed in such interviews allow the articulation of learning, development, and change narratives. Rather than being narratives about particular learning, development, and change, these narratives are concrete realizations of possible narratives that exist for and can be drawn on by all members of a culture speaking the same language.

At all three levels, the participants realize cultural possibilities for doing interviews and for constructing auto/biographical accounts of their careers. That is, despite the very singularity of *this* interview and *this* student's identity, we recognize in the event and the narrative produced culturally possible forms of doing interviews and telling identities. Now the singular nature of the event and identity also means that they have not existed before, which means that they are not reproduced but newly produced forms of interview and identity. Yet the very fact that they recognizably *do* an interview and *construct* an identity tells us that they *reproduce* a cultural form.

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Part A

IDENTITY IN URBAN SCIENCE

INTRODUCTION

Urban classrooms pose particular challenges to systems of schooling, as the contradictions arising from the reproduction of an inequitable society are most salient here. These contradictions are especially salient to the research at the University of Pennsylvania, and perhaps to other U.S. universities as well, where the Faculty of Business, with annual tuition fees exceeding US $60,000, lies within minutes of walk from the poorest neighborhoods and neighborhood schools, where students do not come to school because they only have one set of clothing or do not have the 25 cents for the bus ride. Within minutes from the university, it is dangerous to walk through the streets at night, as there is a high possibility of getting robbed, beat up, and shot. (Few people nowadays remember that MOVE, a radical African American back-to-nature and anti-technology movement, had its headquarters in the same neighborhood. In 1985, the mayor had explosives dropped on a house and more than 10,000 rounds of ammunition were shot, killing six adults and five children.) Within minutes from what many regard as the world's leading business school, young women may be raped if they walk through the streets at an inopportune moment. To the students of the two comprehensive high schools in this part of the city, this is their 'hood, where they live their "normal" social lives; many of them witnessing shootings and experiencing extreme forms of violence from the tenderest of age.

In such situations, it is not just that the identities of science teachers and students are at stake—identities always are at stake. But making it safely through the day takes a particular fluency in survival techniques, that is, a fluency in cobbling together the resources at hand for making and making it through the various settings in which urban youths might find themselves. Urban schools are places that are only marginally safer, as there is always a chance of "getting rolled" or otherwise assaulted. Many U.S. high schools have weapon detectors and it is impossible to enter the school without passing through the detectors and getting checked in some other way by security personnel. Schools as much as any other setting through which urban youths pass during their day are constitutive and become an integral part of their identities. More specifically, students' existing identities continuously are transformed; their new identities continuously emerge from participating in an activity system focused on teaching and learning. From the virtual identities that the students concretely realize is drawn a potential that the identities appropriate, always in a bricolage fashion, transgressing boundaries, never pure, but always characterized by hybridity, heterogeneity.

Nevertheless, scholars and even the individuals themselves think identity in terms of a constant core Self that remains unchanged through time. The constancy of identity is called into question especially, however, in moments of crisis or when

people change from one activity system to another, thereby continuously threatening the sense of a constant self that is maintained over time. In each situation of their daily praxis, students (and teachers) are involved in the struggle of making and remaking who they are, how they understand themselves, and how they are understood by others. Identity definitely is not a stable given that individuals take in and out of situations; rather, identity can be regarded as one of the outcomes of a person's participation in ongoing activity.

In this first part of the book, both Kenneth Tobin and Stacy Olitsky write about the development of identity from the same urban setting, two schools in Philadelphia where there has been a seven-year research program on learning science in urban settings. The two chapters, therefore, are complementary and should give readers at least a kaleidoscopic perspective of the issues arising for development in the kinds of settings that the authors have worked in. Tobin's longitudinal study focuses on Shakeem, a student who, despite all the odds stacked against him, ultimately makes it into college, where he, contradictorily, supported by a drug dealer, eventually makes the dean's list (of outstanding students). Tobin's account is rich, noting all the contradictions one might find in heterogeneous and continuously changing identities cobbled together from a multitude of resources in a constant bricolage that has as its major goal to *make do*. It is perhaps above all his participation as a youth researcher that mediates Shakeem's learning, his appropriation of sociological discourse on Tobin's research squad, and his becoming aware of his own societal position that ultimately allows him to be sufficiently successful to get into college and be successful even there.

Stacy Olitsky provides a fascinating account of identity development in another urban science classroom in the same city and, in the course, develops a theoretical framework grounded in sociology of emotion. She shows how during successful interaction rituals, emotional energies are both reproduced and augmented, as other participants who co-constitute the collective entrain them into solidarity.

Jrène Rahm conducts her studies in the larger Montreal area where she works with poor urban youth, many of whom are immigrants, and especially with girls. Although Rahm does not do so, we can envision the usefulness of the concept of identity as the result of a diasporic praxis that leads to hybridity, difference, and heterogeneity (Roth, 2006). The children Rahm works with come from different countries or are born to parents who recently immigrated to Canada, and who cobble together momentary and continually transitional identities from the various cultural resources—parent culture, French, English, other cultures present in Montreal.

REFERENCES

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