Working toward third space in content area literacy: An examination of everyday funds of knowledge and Discourse

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This study, at its core, is about literacy learning in the secondary school content areas. It is, however, about more than what one might think of as literacy, because we believe that literacy is a complex construct and that secondary content area literacy learning and its use are particularly complex. It is important to acknowledge the many different funds of knowledge (Moll, Veléz-Ibañéz, & Greenberg, 1989) such as homes, peer groups, and other systems and networks of relationships that shape the oral and written texts young people make meaning of and produce as they move from classroom to classroom and from home to peer group, to school, or to community. It is equally important to examine the ways that these funds, or networks and relationships, shape ways of knowing, reading, writing, and talking—what Gee (1996) called Discourses—that youth use or try to learn in secondary schools.

In particular, the meeting of different disciplinary knowledges, Discourses, and texts throughout a single day in a secondary school requires sophisticated uses of language and literacy by teachers and students as they explore upper level content concepts such as science, history, literature, and mathematics (cf. Adler, 1999; Borasi & Siegel, 2000; Crawford, Kelly, & Brown, 2000; Hinchman & Zalewski, 1996). The same text could be approached in different ways depending on the disciplinary (or other) context in which the text is being read or written. In addition,

IN THIS article we analyze the intersections and disjunctures between everyday (home, community, peer group) and school funds of knowledge and Discourse (Gee, 1996) that frame the school-based, content area literacy practices of middle school-aged youth in a predominantly Latino/a, urban community of Detroit, Michigan, in the United States. Using data collected across five years of an on-going community ethnography, we present findings on the strength of various funds that shape the texts available to a sample of 30 young people in the community and school we studied. We then present the patterns that we analyzed across each of the different documented funds. We use our findings on the funds that youth have available to them outside of school to suggest possibilities for working toward third space (Bhabha, 1994; Gutiérrez, Baquedano-López, Alvarez, & Chiu, 1999; Soja, 1996) around literacy and content learning in the seventh- and eighth-grade, public school science classrooms of these youth, and we draw implications for literacy teaching and research in other content areas.

EN ESTE artículo analizamos las intersecciones y fracturas entre las fuentes cotidianas (hogar, comunidad, grupo de pares) y escolares de conocimientos y tipos discursivos (Gee, 1996). Estas constituyen el marco de las prácticas escolares de alfabetización en las áreas de contenido para jóvenes de escuela media en una comunidad urbana predominantemente latina de Detroit, Michigan, USA. Utilizando datos recogidos durante cinco años en un estudio etnográfico en curso, presentamos hallazgos acerca de la fuerza de varias fuentes que conforman los textos de los que disponen 30 jóvenes de la comunidad y la escuela estudiadas. Usamos los hallazgos sobre los recursos a los que los jóvenes tienen acceso fuera de la escuela para sugerir posibilidades de trabajo sobre el tercer espacio (Bhabha, 1994; Gutiérrez, Baquedano-López, Alvarez, & Chiu, 1999; Soja, 1996) en alfabetización y aprendizaje de contenidos para aulas de ciencia de séptimo y octavo grado en escuelas públicas. Asimismo formulamos implicancias para la enseñanza y la investigación en otras áreas de contenido.

IN DIESEM Artikel analysieren wir Verbindungen und Trennungen zwischen dem Alltag (dem Zuhause, in der Gemeinschaft, bei Gleichaltrigen untereinander) und gegenüber schulischen Wissensgrundlagen und Diskurs (Gee, 1996), welche die schulfächer-basierenden Schreib- und Lesepraktiken von jugendlichen Mitschülern in einer überwiegend latein-amerikanischen Stadtgemeinde in Detroit, Michigan, in den Vereinigten Staaten einrahmen. Unter Benutzung von über fünf Jahren gesammelter Daten einer fortlaufenden ethnischen Gemeinschaftserhebung präsentieren wir Ermittlungen aufgrund der Überzeugungskraft verschiedener Grundlagen, welche die vorhandenen Texte gestalten, die wir anhand einer Auswahl von 30 Jugendlichen in der Gemeinde und Schule studierten. Danach präsentieren wir Musterbeispiele, die wir quer durch die unterschiedlich dokumentierten Grundlagen weiter analysierten. Wir wandten unsere Erkenntnisse auf jene Grundlagen an, die den Jugendlichen außerhalb der Schule zur Verfügung stehen, um Entwicklungsmöglichkeiten des Einwirkens zum dritten Raum (Bhabha, 1994; Gutiérrez, Baquedano-López, Alvarez, & Chiu, 1999; Soja, 1996) im Schreib- und Leseumfeld und fächerbezogenen Lernen dieser jugendlichen Schüler aus den siebten und achten wissenschaftlichen Fachklassen (Science) in öffentlichen Schulen aufzuzeigen, und wir ziehen daraus Implikationen zum Unterrichten im Schreiben und Lesen und der Erforschung in anderen Fachunterrichtsbereichen.

ABSTRACTS

Working toward third space in content area literacy: An examination of everyday and classroom knowledge and Discourse

Trabajando hacia el tercer espacio en alfabetización en las áreas de contenido: Un estudio de los conocimientos y el discurso en la vida cotidiana y el aula

Hinwirken zum dritten Raum im fachgebiets-bezogenen Lesen und Schreiben: Eine Untersuchung über Wissensaufnahme und Diskurs im Alltagsleben und im Klassenraum

内容領域リテラシーにおける第３空間に向けて：日常及び教室の知識とディスコースの研究

本稿では、アメリカ合衆国ミシガン州デトロイトの都市にあるラテンアメリカ系主体の共同体の中学生の、学校を基礎とした内容領域リテラシー実践の枠組みとなる日常（家庭、共同体、仲間集団）及び学校貯蓄の知識とディスコース (Gee, 1996) の交差と分裂を分析する。５年間に及んだ進行中のコミュニティー・エスノグラフィーで収集したデータを用いて、研究対象の共同体と学校の子供達３０人が利用できるテキストを形作る様々な貯蓄の強みに関して結果報告する。そして、報告した様々な貯蓄それぞれについて分析したパターンを提示する。公立中学校１、２年生の理科の教室におけるリテラシーと内容学習に関する第３空間 (Bhabha, 1994; Gutiérrez, Baquedano-López, Alvarez, & Chiu, 1999; Soja, 1996) に向けて努力していくための可能性を提案するために、学校外で子供達が利用できる貯蓄に関する結果を用いる。そして、他の内容領域におけるリテラシーの教育と研究のための示唆を述べる。

Travailler en vue de la troisième dimension comme contenu de littératie: Un examen des connaissances et du discours quotidien

NOUS ANALYSONS dans cet article les interesections et les disjonctions entre les fonds de connaissance et de discours dans la vie quotidienne (à la maison, dans une collectivité, entre pairs) et à l'école (Gee, 1996) qui structurent les contenus scolaires des pratiques de littératie de jeunes du second degré dans une communauté urbaine à dominante latino de Détroit, Michigan, aux Etats-Unis. Utilisant les données recueillies au long de cinq années d'une étude de type ethnographique, nous présentons les lignes de force des différents fonds qui structurent les textes dont dispose un échantillon de 30 jeunes de la communauté et de l'école étudiés. Nous présentons ensuite les caractéristiques découvertes pour chacun de ces différents fonds documentaires. Nous utilisons nos résultats relatifs aux fonds dont disposent les jeunes hors de l'école pour suggérer des possibilités de travail sur la troisième dimension (Bhabha, 1994; Gutierrez, Baquedano-Lopez, Alvarez, & Chiu, 1999; Soja, 1996) en ce qui concerne la littératie et l'acquisition de connaissances en septième et huitième années, dans les cours de sciences des écoles publiques où sont scolarisés ces jeunes, et en tirons des implications pour l'enseignement de la littératie et pour la recherche dans d'autres domaines.

Движение к третьему измерению в области предметной грамотности: исследование бытовых и школьных знаний и дискурса

В статье анализируются совпадения и разрывы, существующие между бытовым (тем, что усваивается дома, в обществе и среди сверстников) и школьным (основанным на учебной, привязанной к конкретным предметам практике общения со словом) знанием и дискурсом (Gee, 1996). Исследование проводилось среди учащихся среднего школьного возраста, в основном, латиноамериканского происхождения, проживающих в Детройте, штат Мичиган, США. Используя этнографические данные, непрерывно собиравшиеся в течение пяти лет, мы представляем результаты анализа различных языковых ресурсов, на основе которых формируются тексты, доступные 30 типичным школьникам в исследованном нами сообществе и школе. Каждый образец текста проанализирован относительно каждого из зарегистрированных языковых ресурсов. Используя результаты, полученные по ресурсам, доступным учащимся вне школы, мы предлагаем возможные стратегии их объединения с ресурсами учебными, то есть путь к созданию «третьего измерения в области предметной грамотности» (Bhabha, 1994; Gutiérrez, Baquedano-López, Alvarez, & Chiu, 1999; Soja, 1996) семи- и восьмиклассников в рамках обучения естественным наукам. Кроме того, предлагаются выводы, связанные с развитием грамотности и исследовательской культуры и в других предметных областях.

teachers and students bring different instructional, home, and community knowledge bases and Discourses to bear on classroom texts. The potential for competing Discourses and knowledges is especially high in classrooms where students come from backgrounds and experiences different from those of their peers or their teachers (Moje, Collazo, Carrillo, & Marx, 2001). Each of these points suggests the need for strategic integration of the various knowledges, Discourses, and literacies that youth bring to and experience in school.

To that end, in this article we present findings on the strength of and patterns in various funds of knowledge and Discourse available to 30 middle school students in a predominantly Latino/a, urban community of Detroit, Michigan, in the United States, and we examine the types of literacy practices used in those different funds. We use our findings to suggest possibilities for integrating different, and sometimes competing, academic and everyday knowledges and Discourses with the teaching of literacy practices and content texts in the seventh- and eighth-grade, public school science classrooms of these youth.

We work from the premise that the fields of adolescent and content area literacy research and practice need more information about the funds of knowledge and Discourse that youth draw on if educators are to construct classroom spaces that can integrate in- and out-of-school literacy practices. We focus on adolescents and on secondary school classrooms because the majority of work on merging family and community funds of knowledge (and Discourse) has focused on children in the elementary school grades (Gutiérrez, Baquedano-López, Tejeda, & Rivera, 1999; McCarthey, 1997; Moll, 1992; Moll & Gonzalez, 1994). But we also argue that, despite a growing knowledge base on the literacy practices of youth outside of school (Alvermann, Young, Green, & Wisenbaker, 1999; Finders, 1997; Lewis & Fabos, 1999; Moje, 2000; Shuman, 1986), there is little research on how those literacy practices (a) reflect particular funds of knowledge and Discourse and (b) might connect to, inform, and even be integrated with the knowledges and Discourses valued— or even privileged as the best form of knowledge and Discourse—in the secondary school disciplines.

We focus on the content area of science because we have noted that a number of studies of English language arts (ELA) learning have suggested ways to bring popular cultural texts into the classroom (e.g., Alvermann, Moon, & Hagood, 1999), but fewer studies have examined how out-of-school funds and texts can be integrated with literacy learn-

ing in school disciplines other than ELA. Because science represents a highly specialized area of study, with a number of unique discursive conventions and with particular assumptions about what counts as knowledge, the question of integrating the literacy practices and texts of in- and out-of-school funds of knowledge and Discourse seems particularly challenging.

Following the lead of several scholars (Bhabha, 1994; Gutiérrez, Baquedano-López, Tejeda, et al., 1999; Soja, 1996), we call this integration of knowledges and Discourses drawn from different spaces the construction of "third space" that *merges* the "first space" of people's home, community, and peer networks with the "second space" of the Discourses they encounter in more formalized institutions such as work, school, or church. Although we have chosen to align the concept of first space with that of the everyday world that is close to or common to people, the naming of what counts as first or second space is arbitrary; one could easily reverse these labels to suggest that first space is often that space which is privileged or dominant in social interaction, whereas second space is that which is marginalized. What is critical to our position is the sense that these spaces can be reconstructed to form a third, different or alternative, space of knowledges and Discourses.

It is critical to examine not only knowledges and Discourses themselves but also the funds in which knowledges and Discourses are generated, because the funds help to make visible the social construction of knowledges and Discourses. If the social nature of all funds—whether schools, communities, disciplines, popular culture, peer groups, or families—is not recognized, then the knowledges and Discourses generated in each seem to take on a life of their own, as if they are somehow natural constructions that exist outside human interaction and relationships. We argue that the active integration of multiple funds of knowledge and Discourse is important to supporting youth in learning how to navigate the texts and literate practices necessary for survival in secondary schools and in the "complex, diverse, and sometimes dangerous world" they will be part of beyond school (Moore, Bean, Birdyshaw, & Rycik, 1999).

We focus on the funds that are available to students rather than on the instructional practices of the classrooms. Although we have particular theories about what teaching for third space might look like, we did not enter this study with the assumption that any of the teachers we were working with would be constructing third space in their classrooms, nor did we assume that they were not. Instead, we entered the study with the goal of documenting the funds of

knowledge and Discourse, particularly the out-of-school funds that shaped students' interactions with texts in and out of school. To that end, we collected data in classrooms to analyze when and how students and teachers brought various funds to bear on classroom texts, but we did not analyze the instructional moves per se. Our guiding research questions for the study were (a) what are the different funds of knowledge and Discourse that may shape students' reading, writing, and talking about texts in their science classrooms, and (b) when and how, if at all, do students bring these knowledges and Discourses to bear on school science learning?

In the next section, we present various perspectives, including our own, on third space. We then proceed to a discussion of research and theory in content literacy learning and to our findings of this study.

Theoretical perspectives on third space and hybridity

As outlined in the previous section, our work assumes that we must study community or everyday funds of knowledge and Discourse to understand how language and literacy are practiced and how content concepts are constructed in the multiple communities of practice that youth encounter. However, our work also draws from other critical and social theories. In particular, our analyses are framed by hybridity theory, which recognizes the complexity of examining people's everyday spaces and literacies, particularly in a globalized world (Bhabha, 1994; Soja, 1996). Hybridity theory posits that people in any given community draw on multiple resources or funds to make sense of the world and, in our work, to make sense of oral and written texts. Further, hybridity theory examines how being "in-between" (Bhabha, 1994, p. 1) several different funds of knowledge and Discourse can be both productive and constraining in terms of one's literate, social, and cultural practices—and, ultimately, one's identity development. The notion of hybridity can thus apply to the integration of competing knowledges and Discourses; to the texts one reads and writes; to the spaces, contexts, and relationships one encounters; and even to a person's identity enactments and sense of self. Hybridity theory connects in important ways to third space, because third spaces are hybrid spaces that bring together any or all of the constructs named above.

Geographic and discursive perspectives on third space

Some scholars refer to this in-between, or hybrid, space as "third space," explicitly emphasizing the role of the physical, as well as socialized, space in which people interact. Soja (1996), for example, called for a reconceptualization of human interaction around the concept of space, arguing,

> The spatial dimension of our lives has never been of greater practical and political relevance than it is today. Whether we are attempting to deal with the increasing intervention of electronic media in our daily routines; seeking ways to act politically to deal with the growing problems of poverty, racism, sexual discrimination, and environmental degradation; or trying to understand the multiplying geopolitical conflicts around the globe, we are becoming increasingly aware that we are, and always have been, intrinsically spatial beings, active participants in the social construction of our embracing spatialities. (p. 1)

Soja's project is an argument for how physical space operates in the socialization of human interaction and, concomitantly, how social spaces can shape the physical. The concept of third space, from Soja's perspective, demands looking beyond the binary categories of first and second spaces of the physical and social; for our work, the first and second spaces constructed in opposition to one another might be the everyday and the academic, primary and secondary Discourses (Gee, 1996), spontaneous and scientific concepts (Vygotsky, 1986), or out of and inside school (Moje, 2000).

In this analysis, we extend and apply Soja's critique of binaries to "draw selectively and strategically from the two opposing categories to open new alternatives" (1996, p. 5). In third space, then, what seem to be oppositional categories can actually work together to generate new knowledges, new Discourses, and new forms of literacy. Indeed, a commitment to third space demands a suspicion of binaries; it demands that when one reads phrases such as "academic *versus* everyday literacies or knowledge," one wonders about other ways of being literate that are not acknowledged in such simple binary positions. One also wonders about how and when these forms of literacy overlap and whether everyday practices might, at times, look more like academic literacies than they do like everyday literacies. Our argument here is also modeled in part on Brandt's (1990) deconstruction of the binary between oral and literate forms of representation.

Postcolonial and discursive perspectives on third space

Bhabha (1994) also used the term *third space* (p. 36) in his critique of modern notions of culture, but Bhabha cast third space in a more explicitly discursive frame than did Soja, arguing that "Third Space...constitutes the discursive conditions...that ensure that...even the same signs can be appropriated, translated, rehistoricized and read anew" (p. 37). Bhabha's argument is that third space is produced in and through language as people come together, and particularly as people resist cultural authority, bringing different experiences to bear on the same linguistic signs or cultural symbols and, likewise, different signs and symbols to bear on the same experiences. Bhabha's notion of third space evokes a sense of instability of signs and symbols, a challenge to dominant conceptions of the "unity and fixity" (p. 37) of culture and language. If the meanings and symbols of culture have no fixed sense, and if signs can be appropriated and resignified, then what a particular disciplinary concept or literacy practice signifies is open to divergent, but independently valid, interpretations.

Bhabha's work is situated in the Discourse of postcolonialism, but the privileged position of certain Discourses in academic texts is akin to the privilege accorded to the ways of knowing of the colonizer. Academic texts can limit some students' learning as they struggle to reconcile different ways of knowing, doing, reading, writing, and talking with those that are privileged in their classrooms. School texts can act as colonizers, making only certain foreign or outside knowledges and Discourses valid. The struggles students may experience as they try to reconcile competing Discourses can result in what Bhabha referred to as a "splitting" (pp. 98–99, 131) of discourse, culture, and consciousness, in which students both take up and resist the privileged language of academic contexts.

For Bhabha, this splitting is both problematic and productive. The splitting, or the doubling and tripling of discourse, culture, and consciousness, can result in the anxious subject—a person who struggles to achieve a strong sense of self, but who must always articulate himself or herself in response to an "Other." At the same time, Bhabha argued, it is in this struggle for identity and selfhood that "newness enters the world" (1994, p. 212). The struggle over and through different Discourse communities and views of knowledge can be made productive, but only if people are not constantly defined in relation to a dominant Discourse. Third space, then, becomes a productive hybrid cultural space, rather than a fragmented and angst-ridden psychological space, only if teachers and students incorporate divergent texts in the hope of generating new knowledges and Discourses.

For our purposes, Bhabha's conception of third space might productively be extended to destabilize what counts as literate or knowledgeable practice in school, the different disciplines, and the everyday world. Applied to schooling and the content area disciplines, Bhabha's view of third space suggests that academic knowledges and Discourses need not be accorded an absolute and exclusive privilege, precisely because there is potential for the rearticulation of both academic and everyday knowledges, as well as of the Discourses constituted by the communities that produce such knowledges.

Educational and discursive perspectives on third space

Gutiérrez, Baquedano-López, Tejeda, et al. (1999) offered a third, and more educationally and linguistically explicit, perspective on third space. Gutiérrez, Baquedano-López, Alvarez, and Chiu (1999) argued that the many different Discourses to which students have access or with which they are confronted can be viewed as *resources* for helping students develop stronger understandings of the natural world, both in content area classrooms and in their everyday lives. For Gutiérrez and her colleagues, the hybrid nature of these different Discourses is used to generate a third space that provides the "mediational context and tools necessary for future social and cognitive development" (Gutiérrez, Baquedano-López, Alvarez, et al., 1999, p. 92). Gutiérrez and her colleagues' perspective on third space differs significantly from Soja's and Bhabha's in the sense that they see third space as a bridge between community or home-based Discourse to school-based Discourse. Third space, for Gutiérrez and her colleagues, is a hybrid space, but it is less a space in which new types of knowledges are generated and more a scaffold used to move students through zones of proximal development toward better honed academic or school knowledges.

In sum, it could be argued that there are at least three current views of third space. One view positions third space as a way to build bridges from knowledges and Discourses often marginalized in school settings to the learning of conventional academic knowledges and Discourses (e.g., Gutiérrez, Baquedano-López, Alvarez, et al., 1999; Gutiérrez,

Baquedano-López, Tejeda, et al., 1999; Heath, 1983; Hudicourt-Barnes, 2003; Lee & Fradd, 1998; Moll et al., 1989; Warren, Ballenger, Ogonowski, Rosebery, & Hudicourt-Barnes, 2001). Such a third space is important because it provides opportunities for success in traditional school learning while also making a space for typically marginalized voices. Indeed, each of the studies cited here has demonstrated both increased academic engagement and learning gains when third spaces are built in classrooms.

A second view is that of third space as a navigational space, a way of crossing and succeeding in different discourse communities (Lee, 1993; New London Group, 1996). At the secondary level, in particular, this has been a dominant perspective because of the need to cross the discursive boundaries posed by the different disciplines as students encounter specialized texts of the content areas (Hicks, 1995/1996; Hinchman & Zalewski, 1996; Lemke, 1990; Luke, 2001; Moje et al., 2001; New London Group, 1996). Studies of such practices indicate that teaching navigational skills via students' everyday knowledges has led to students' growth in developing conventional academic knowledges and literacy skill (Hammond, 2001; Lee, 1993; Moje et al., in press; Morrell & Collatos, 2003; Wong, 1996). These studies also suggest that third spaces that engage students in exploring multiple funds of Discourse and knowledge related to science can support their abilities to navigate different contexts by drawing from skills they possess across those contexts (see Hammond, 2001).

Finally, third space can be viewed as a space of cultural, social, and epistemological change in which the competing knowledges and Discourses of different spaces are brought into "conversation" to challenge and reshape both academic content literacy practices and the knowledges and Discourses of youths' everyday lives (e.g., Barton, 2001; Hammond, 2001; Lee, 1993; Moje et al., 2001; Moll & Gonzalez, 1994; Morrell, 2002; Seiler, 2001). The few studies of classroom practices that seek to challenge dominant knowledges and Discourses generally demonstrate gains in students' academic literacy skills because of the bridges that are built even as students move toward developing new knowledges. Fewer studies (e.g., Barton, 2001; Morrell & Collatos, 2003; Seiler, 2001) have documented students' growth in terms of developing new, critical understandings that integrate science and their everyday worlds. Thus, more research, using a variety of methods, needs to be conducted on third space as a space wherein everyday and academic knowledges and Discourses are challenged and new knowledges are generated.

We draw on all three of these views of third space. That is, we see the bringing together of Discourses and knowledges in third space as a productive scaffold for young people to learn the literacy practices that are framed by the Discourses and knowledges privileged in the content areas. With this scaffold, students would be able to better access and negotiate the privileged texts of upper level, content area classrooms. We also believe that explicit engagements with the texts of competing discourse communities will help youth learn to navigate multiple texts and communities successfully. However, our ultimate goal is to work toward third space that brings the texts framed by everyday Discourses and knowledges into classrooms in ways that challenge, destabilize, and, ultimately, expand the literacy practices that are typically valued in school and in the everyday world. Thus, this perspective extends the concept of building bridges between new knowledges and what is already known (Anderson & Pearson, 1984). Building bridges is a necessary part of what makes third space because it helps learners see connections, as well as contradictions, between the ways they know the world and the ways others know the world. Although this seems to reestablish binaries, it does not necessarily do so. Building bridges simply connects people from one kind of knowledge or Discourse to other kinds. Unlike the bridge perspective, however, a third space focused on cultural, social, and epistemological change, something we do not claim to have perfected but something we are trying to work toward, is one in which everyday resources are integrated with disciplinary learning to construct new texts and new literacy practices, ones that merge the different aspects of knowledge and ways of knowing offered in a variety of different spaces.

To that end, we present in this article at least some of the "stuff" necessary for constructing third spaces—that is, the knowledges and Discourses that frame students' everyday and school reading and writing. It is not our purpose in this article to represent the construction of third space on the part of the teachers we worked with, nor is it to analyze or critique the teaching that we observed. None of the teachers entered this project claiming to build third spaces, although many made attempts to connect science concepts to students' experiences, usually as a way of motivating students. In fact, they seek to understand better the funds that students draw on to make sense of classroom texts, and, consequently, they hope to use these findings to work toward what

we and others would refer to as third space in their content classrooms. Before we turn to those findings, we offer a review and model of literacy learning and third space in secondary school content areas.

Empirical and theoretical perspectives in content area and youth literacy

Historically, research on content area or disciplinary literacy has focused on constructing strategies that scaffold students' ability to comprehend and extract information from content area written texts (Alvermann, Dillon, & O'Brien, 1987; Alvermann, Moore, & Conley, 1987; Anders & Guzzetti, 1996; Bean, 2000; Holliday, 1991; Padak & Davidson, 1991). The general value of these strategies for helping young people learn to access information from texts is well documented (Alvermann & Moore, 1991), but the strategies have typically been viewed as separate from the learning of the content, as evidenced by the fact that methods courses addressing content area literacy methods exist in most teacher education programs. Rather than embedding the teaching of disciplinary literate practices into a discipline's education courses, generic literacy strategies typically are offered in single courses, and teachers have to apply the strategies to the texts of their disciplines.

In contrast to the generic strategies approach, we argue that it is difficult to distinguish between *content learning* and *content literacy learning*. In fact, a critical aspect of learning in any discipline involves learning to communicate through oral and written language, among other forms of representation, in that discipline. For example, learning science, which is the focus area for this study, is as much about learning to talk, read, and write science as is it about learning a set of scientific concepts or facts (Lee & Fradd, 1998; Lemke, 1990). The opposite is also true: To be literate in a content area involves learning the content associated with the area.
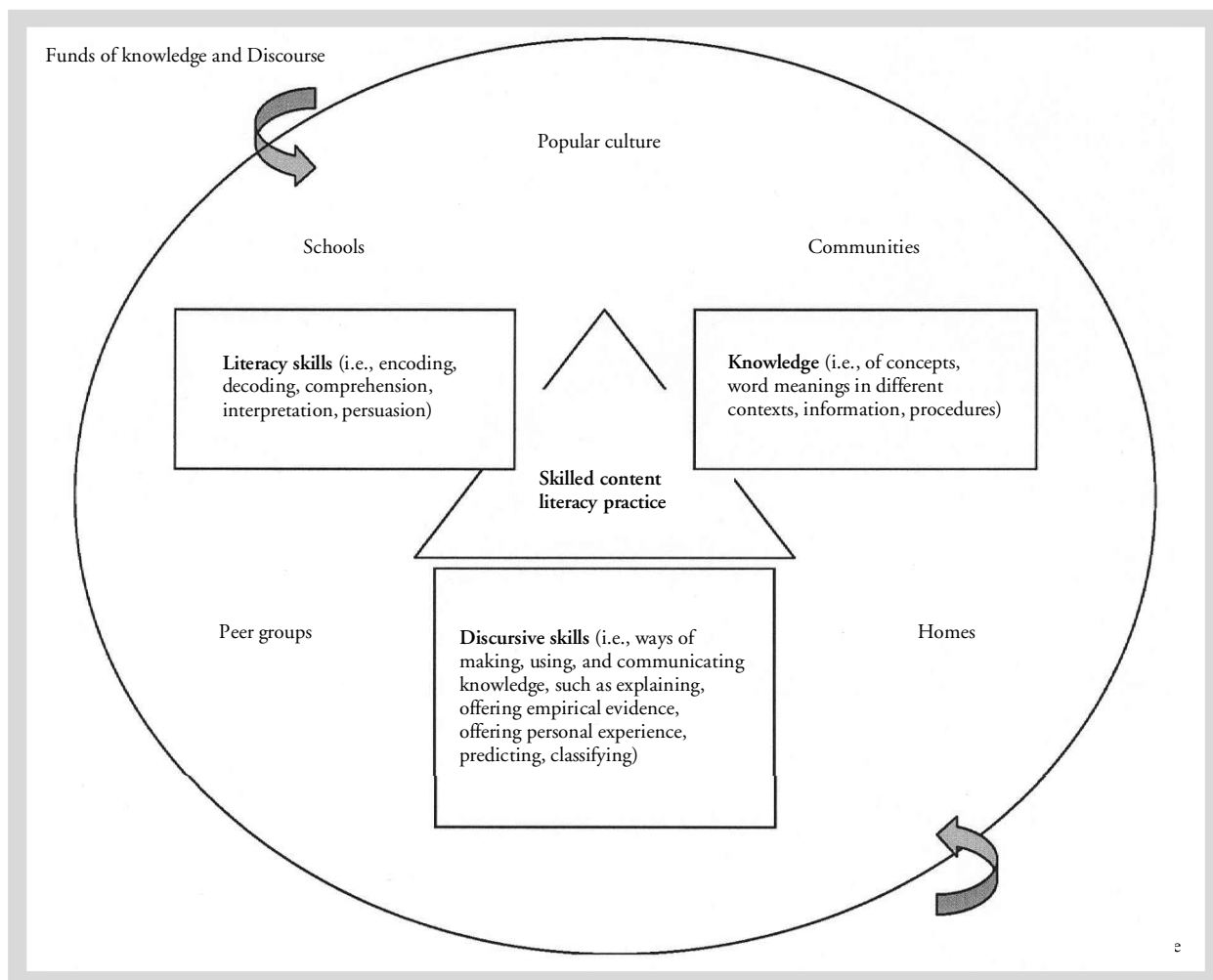
The primary aspects of a content literacy model, then, include content knowledge, literacy skills, and discursive skills, as represented in Figure 1. Being literate in a content area also requires some basic processing skills, such as decoding and encoding, as well as the ability to comprehend ideas in a text by linking them with or contrasting them to one's own ideas about a phenomenon. Yet there is more: Content area literacy involves more than de-

coding and encoding of printed words and more than comprehending technical terms (Hicks, 1995/1996; Lemke, 1990; Luke, 2001). Being literate requires both interpretive and rhetorical skills; that is, readers must be able to interpret a text's meaning and importance beyond basic comprehension. Further, writers of content text must be able to predict what their audiences will know and believe, and writers must use language and concepts in a way that persuades the audience to interpret their texts in particular ways. To engage in any of those literacy and discursive skills requires knowing certain information, understanding the major concepts of the area, and being able to define the conventional definitions of certain terms and phrases. In other words, it requires some content knowledge. Perhaps more important, however, is that being literate in a content area requires an understanding of how knowledges are constructed and organized in the content area, an understanding of what counts as warrant or evidence for a claim, and an understanding of the conventions of communicating that knowledge.

Lemke (1990), for example, has argued that science learning, in particular, requires an understanding of the epistemological assumptions or "thematic formations" (p. 202) that undergird knowledge production and representation in the discipline of science. These thematic formations get represented in both the written and oral texts of the classroom, and they shape how technical terms are used and understood; how procedures for scientific inquiry are enacted; and how people talk, read, and write in science. Specifically, the thematic formations of science as a discipline and profession revolve around deepening, and often challenging, everyday knowledges (Popper, 1988). Indeed, scientific discourse practices may depend on eschewing everyday knowing (i.e., a personal experience is not adequate warrant for a claim in scientific Discourse; cf. Lemke, 1990).

Scientific Discourse also tends to be focused on controlling the natural world in the attempt to produce innovations, tools, or solutions that improve human life. Science, particularly as enacted in school classrooms, is typically not about experiencing the world or expressing one's relationship to it, but about analyzing and changing it (Crawford et al., 2000; Dillon, O'Brien, & Volkmann, 2001; Kelly & Green, 1998; Lemke, 1990; Moje, 1996), although for those deeply invested in the discourse community, analysis may become concomitant with how they experience the world and express their relationship to it. But youth who are new to the Discourse community of science are implicitly asked to set aside

FIGURE 1
SKILLED CONTENT LITERACY—A MODEL

Funds of knowledge and Discourse

Popular culture

Schools

Communities

Literacy skills (i.e., encoding, decoding, comprehension, interpretation, persuasion)

Knowledge (i.e., of concepts, word meanings in different contexts, information, procedures)

Skilled content literacy practice

Peer groups

Homes

Discursive skills (i.e., ways of making, using, and communicating knowledge, such as explaining, offering empirical evidence, offering personal experience, predicting, classifying)

what and how they have come to know in the world, or to reframe what and how they know in terms of problems to be solved.

All of these sets of skills, and probably many others that we have left unaddressed, come together to form skilled content area literacy practice. The complexity of the process of learning to be literate in a content area lies in the fact that these skills are interdependent. That is, being able to access content knowledge depends at some level on one's understanding of the discursive conventions of the content area. In a similar manner, developing strong interpretive or rhetorical skill in a content area requires that one understand the relevant content concepts. In short, content literacy learning is complicated. In fact, a number of disciplinary literacy scholars have argued that because literacy practices are always embedded in Discourse (Gee, 1996), content area liter-

acy learning requires taking up new identities as one takes up new Discourse (cf. Gee, 2001; Luke, 2001).

Thus, we argue that for youth to comprehend, interpret, or challenge the texts of classroom disciplinary Discourse communities, they need access to a complex set of assumptions, an awareness of how Discourse operates and knowledge is produced in both their everyday and school lives, and support in learning how to navigate and cross the sets of assumptions they encounter and the identities they construct in those different spaces. Teachers and researchers need to have a better understanding of the various funds of knowledge and Discourse that shape literate practices in secondary content areas if we are to bridge different Discourses; engage in metadiscursive practice (New London Group, 1996); and construct content area classrooms where binaries can be

deconstructed and new knowledges, Discourses, and literacy practices can be produced.

Research design and methods

This study draws from data collected as part of an ongoing community ethnography and school study (currently entering its sixth year) of a predominantly Latino/a community and public school of choice nestled within the city of Detroit, Michigan, USA. Detroit's population is predominantly African American.

Our data collection and analyses are informed by the discourse and cultural theories (Bhabha, 1994; Gee, 1996; Lemke, 1990; Luke, 1995/1996; Soja, 1996) and the sociocultural theories (Moll & Whitmore, 1993; Vygotsky, 1986) reviewed in the previous section. This particular study, guided by the research questions identified in the introduction, was embedded in two larger projects. One is an ethnography of the community and is focused on youth literacy, culture, and identity practices, not necessarily connected to science learning (see Moje, in press). The second is a systemic project-based science curriculum development, enactment, and research project conducted in collaboration with the Detroit Public Schools (see Blumenfeld, Marx, Krajcik, Fishman, & Soloway, 2000).

Participants and sites

Primary participants in this portion of the study are 30 youth (20 females and 10 males), ages 12–15, who live in different neighborhoods within the Latino/a community. We asked each participant to choose a pseudonym, and because some students chose the same pseudonym, we distinguish between them with the first letter of their surnames. The participants represented in this article volunteered for the study as we enacted science curricula in their two-way bilingual (Spanish/English) immersion school over the course of the five years. Ten of the youth approached us about participating after hearing our recruitment pitch; we approached the rest as we purposively sampled from classrooms to try to recruit an equal number of male and female participants using the following characteristics: (a) level of participation in classroom activity, (b) types and content of their academic and social writings, (c) interactions with the teacher and with other students, (d) types of literacy practices in which they participate, and (e) interest in possibly participating in an after-school literacy project. Although we attempted to recruit an equal number of male and female youth, our recruitment yielded more females than males.

The participants were first recruited into classroom-based research that focuses on scientific literacy learning and then were recruited to participate in a long-term study with us outside of school. In all cases, we did not know the participants prior to meeting them in their seventh- and eighth-grade classrooms, although nine were recruited during their eighth-grade year after we had studied in their seventh-grade classrooms for an entire year, so they were familiar with us prior to participating in the study.

Our current relationships with the youth, however, could be described as deeply developed and close-knit. We have worked diligently to establish a sense of trust with these youth and their families, and the openness with which they share their experiences with us suggests that we have succeeded at some level. It should be noted, however, that although the youth trust us and confide in us, they do not see us as peers. Regardless of age, the research team members inhabit a curious space. We are not quite peers, not quite parents, and not quite teachers. Several of the youth see us as researchers but also turn the research back on us. For example, on one occasion, one of the young women in the group asked Elizabeth Moje (first author), "What kind of person do *you* think I am?" Another young man recently told Moje what he thought should be the title of the book he wanted her to write from this research. This kind of interaction indicates to us that the youth feel some level of trust in us—that they recognize they are part of a research activity and that they see themselves as active and serious participants.

The participants all live in low-income or working-class homes. Although all 30 youth could identify themselves as Latino/a, they claim different countries as their countries of origin, and they identify in more complex ways than a single term could represent. All but three claim some aspect of Mexican ancestry; the others are Puerto Rican and Dominican (the representation in the community is more diverse, however). Among those whose ancestry is Mexican, the youth identify variably as Mexican, Chicano/a, Tejano/a, Mexicano/a, and Mexican American, depending on when and where they were born, and when and where we ask them about their ethnic identities. Claims about the exact nature of the youths' ethnic background should be viewed with caution, however, as we have learned from some youth, after years of studying with them, that the ethnic identity they claim and their ethnic

backgrounds of birth are not always parallel. Thus, it is difficult to count exactly how many identify as one type of Latino/a or another, mainly because those identifications shift over time, space, relationships, and activities. Their relationships with research team members indicate the fluidity of their ethnic identity enactments and their sense of ethnicity and race. Although some team members are Anglo, the youth have routinely criticized "white people" in their conversations with us, and when asked about how they feel about us as "white people," they have made comments such as, "You're not white; you're with us." Ethnicity and race to these youth, it seems, may be as much about behavior and attitude as they are about phenotype and background.

As assessed by the language of media representations and store fronts, the community identifies using the words *Hispanic*, *Latino*, *Mexican*, and *Spanish* (the latter word used primarily in reference to language). In individual conversations, however, community members (including the youth) often specify their particular Latino/a roots (e.g., Ecuadorian, Mexican, Dominican, Tejano/a). In our team conversations, we most often use the term Latino/a, but we attempt in our writing and in work with the youth and community to be true to the language of the participants. Readers will thus see many different ethnic identifiers used throughout this article as we try to preserve or reflect the typical language of participants.

All youth participants are bilingual and biliterate in Spanish and English, according to self-report, teacher report, and our observation of their speaking, reading, and writing abilities in both languages in and out of school. We are in the process of coding language surveys to determine levels of fluency, but it should be noted that while levels of oral and written language facility vary among the youth, all are able to communicate orally and in writing with other people in multiple contexts and in both languages. Researcher, teacher, and parent participants in the study, however, are not all bilingual in those two languages. Most community participants to date are bilingual in Spanish and English, and all of the community leaders we have interviewed are also biliterate, although we have not assessed their levels of literacy.

The research team represents a mix of ethnicities, but only one gender: female. Of the team, three Latinas and five Anglo women have routinely collected data across the five-year period. A Latina, an Anglo, and an African American researcher also participate in the constant comparative analyses with the team. All of the researchers have facility with more than one language; however, only five of the researchers are fluent in Spanish and English. The remaining researchers' lack of fluency in Spanish has not posed any obvious problem for carrying out the research with the youth because the youth in the sample are all bilingual at some level (some find Spanish literacy challenging) and can communicate orally in either Spanish or English. In fact, we assert that our mixed language team represents an important advantage for working with the youth of our study because we typically conduct out-of-school interviews in pairs. The pairs are often composed of researchers with differing language abilities, and the English dominant speakers are able to note code-switching among participants more readily than the Spanish/English bilingual researchers on our team, who code-switch along with the participants. As a result, we are able to communicate effectively, while also assessing language practices *in situ*.

Other participants include parents, other students observed and informally interviewed in classroom data collection, teachers, other youth who live in the community, and community members, but data from these participants are not the primary focus of the analyses reported in this article. These participants were not well known by the research team members prior to entering the community, although Moje did meet some community members in her community work prior to the official start of the research.

We concentrate on a group of Latino/a students, primarily because we began to work with this group of students as part of a science curriculum development project. We do not wish to imply, in our focus on Latino/a students, that only Latino/a students, or students of color more generally, require the construction of third space in order to learn. It is possible for all students to benefit if the various funds of knowledge and Discourse they experience in the world are brought into conversation with one another. However, it is also the case that school knowledges and Discourses tend to be aligned most fluidly with the knowledges and Discourses of European American, middle-class families (Bourdieu & Passeron, 1990; Heath, 1983). Thus, it can be argued that although third space could be a goal for all classrooms, it is an especially critical goal for enhancing the education of youth whose experiences have not traditionally been valued in schools. It should also be noted that the majority of teachers in the United States are European American and of middle-class backgrounds (Ladson-Billings, 2000). As a consequence, they may be less familiar with the experiences of Latino/a, low-income, or urban

youth. Therefore, it is important that the funds of knowledge and Discourse of youth of color, of urban areas, and of poverty be uncovered, understood, and brought from the margins of teaching and researching practice to the center. That said, our findings can only be applied to this particular group of Latino/a youth, in this particular space and time, and should not be generalized to all Latinos/as, to all urban youth, or even to youth in general.

Data sources

Data collection methods in the community and in the classrooms included (a) participant observation recorded in field notes; (b) surveys; (c) interviews (informal and formal semistructured, individual and focus group) conducted in various settings around the community and school; and (d) the collection of documents (e.g., curriculum worksheets or readings); artifacts (e.g., texts produced by students, stickers, clothing); and photographs of particular city, home, and school spaces.

Researchers each made classroom observations once a week, amounting to two to three visits per classroom per week each year, for five years. Extended field notes are fleshed out and checked for accuracy by audiotape transcripts of classroom and community interactions. Youth participants were interviewed at least once during the course of the study, and 14 of the youth have been formally interviewed three to five times. Differences in the numbers of interviews conducted with participants are most often explained by the day-to-day availability of the participants to engage in the interviews, although some of those who have been interviewed only one time have left the community and thus were not present for repeated interviewing. In addition, members of the research team formed what we call core relationships with certain groups of youth. Each team member is thus responsible for following her core participants longitudinally, while also engaging with others outside the core as they are available.

The formal interviews typically occurred in settings outside school (e.g., restaurants, shopping malls, movie theaters, homes) for 90–150 minutes each. We conducted both individual and focus group interviews, because group interviews generally reveal different kinds of literacy practices and provide us with direct observation of peer funds. However, we strive to engage each participant in an individual interview prior to group interviewing. Interview protocols included questions specific to youths' science learning (e.g., "What did you learn from the ballistic cart experiment?") as well as questions about how

they studied (e.g., "How did you do this worksheet?"); what they read and wrote outside of school (e.g., "What are you writing?" "What novels have you read lately?" "What magazines are you reading?"); what they did in their free time (e.g., "What music are you listening to?" "Why do you like this song?" "What makes rap different from jazz?"); what they thought of activities we engaged in together (e.g., "What did you like about this movie?"); and their goals for the future (e.g., "What do you want to do when you graduate from high school?").

All students received the same general initial interview, and then variations of these questions were often repeated across successive iterations of interviews. We generally selected a set of questions from the interview protocol to target in each interview, but the interviews also simply followed the lines of conversation that youth initiated, particularly when we interviewed more than one youth at a time, which constitutes a hybrid of focus group interviewing and participant observation. Thus, the interviews generally provided occasions for participant observation as well as formal interviewing, and field notes were written to accompany verbatim transcription. Interviews were transcribed from audiotape.

In school, our analyses revolve around how the youth we have followed out of school engage in six different classes of students, with three different teachers (one Latino and two Anglos) over a five-year period (1998–present). We present contextual information about the curricula under study here in order to ground the classroom-based student data, which we present subsequently in this article. Students in these classes participated in the enactment of three curriculum units designed under the framework of project-based science. In each unit, students were engaged in inquiry around "driving questions" about science-related phenomena. Driving questions included (a) what affects the quality of air in my community (an air-quality unit), (b) what is the water like in my river (a water-quality unit), and (c) why should I wear a bike helmet when I ride my bike (a physics and safety unit)?

Data drawn from the larger ethnography also inform this work. These contextual data include participant observation and informal interviews with the youth participants and their parents at festivals and community events, observations and formal interviews with a network of prominent Latinas in the community, with teachers and students at a community-based after-school program, and with teachers and students at a charter school for middle school-aged Latinas. Interviews at community

events are conducted as participant observation and are thus informal and generated *in situ*, sometimes audiotaped and at other times recorded on paper. We have also mapped the community on two separate occasions by driving through it and recording the kinds of businesses, homes, and public spaces in different areas. We conduct community mapping to understand the physical space that is available to the youth and to situate ourselves in that space. Finally, Moje and Carrillo have participated in community organization and leadership activities.

Data analysis

We used constant comparative analysis (CCA; Glaser & Strauss, 1967; Strauss, 1987; Strauss & Corbin, 1990) to analyze our data. To many readers, CCA may suggest the notion of *grounded theory*, and, indeed, it is our intention to generate and ground theoretical and empirical understandings of funds of knowledge and Discourse that shape students' readings of texts, both in and out of school. However, we do not wish to imply that we approach our data analysis without guiding questions and theories or that the categories we analyze through CCA emerged from the data apart from our particular theoretical stance. As in any analysis, whether engaged for the purpose of theory testing or generation, we brought particular perspectives and views to the analysis that shaped what we were able to see in terms of data categories. In addition, although we did not change our research questions throughout our study, our understanding of the implications of those questions evolved as we moved across the five years of data collection and followed students' practices over time.

Our analyses took place individually and in our research team meetings during the five years. Although it could appear that the analysis process was linear, proceeding from one stage of CCA neatly to the next, in practice our analyses were messy, recursive, and dialogical. Many voices, texts, and data collection experiences came together to tease apart and pull back together these data. Researchers moved on and off the team and brought different ethnic, cultural, theoretical, and experiential (e.g., teaching and research) knowledges and Discourses to bear on the analyses. In particular, our team is interdisciplinary, composed of researchers with backgrounds in anthropology, education, ethnic studies, psychology, rhetoric and composition, sociolinguistics, and sociology. As part of our weekly meetings across the five years, we each wrote theoretical memos (see Strauss, 1987) that generated tentative analy-

ses of the data collected for that week. We read one another's memos and offered additional codes and questions to pursue in the next act of data collection. Further, we regularly shared data and initial analyses with research participants, both youth and teachers, to develop and test our analyses.

As we engaged in ongoing open coding during the five years, we saw patterns in the data around the following codes relevant to the questions we pursued in this study: (a) understandings of the curricular science concepts (e.g., distinctions youth made among concepts such as molecule, atom, and compound or youths' understandings of the concept of *quality* in scientific discourse), (b) definitions and images of science (e.g., science as a benefit to society versus science as causing problems for society), (c) everyday and school funds of knowledge (e.g., textbooks and teachers as school funds of knowledge; parents' employment and television shows as everyday funds of knowledge), and (d) everyday and school Discourse (e.g., classroom talk and written text as school funds of Discourse and peer group talk, popular cultural texts, and written texts as everyday funds of Discourse).

Using these four categories, we moved into axial coding in our third year, while maintaining open coding of new data, in which each coding category is located as a central category and all other codes are analyzed in relation to the central, or axial, code. As we engaged in axial coding with each of these four categories, we found that the separation of knowledges and Discourses was generally too artificial to be of use. That is, although we could see distinctions between knowledges and Discourses, it was also the case that the knowledges we examined were always accompanied by particular ways of knowing or Discourse. Thus, we collapsed categories to examine "knowledges and Discourses," and we simultaneously expanded everyday and school funds into two separate categories. More important, we found that everyday funds of knowledge and Discourse could be further expanded into *family*, *community*, *peer*, and *popular cultural* funds of knowledge and Discourse. In fact, we found these four subcategories to be so important in our data analysis that they warranted becoming their own categorizations rather than being embedded in everyday funds.

We also found that everyday funds often served as important sources of knowledge for making sense of school texts, which we illustrate in subsequent sections, but we maintained the distinction so that we could examine these overlaps as a way of challenging the binary construction of *school* versus *everyday*. These decisions to collapse and expand data

categories were consonant with our theoretical perspectives, which required us to be suspicious of the binary classifications that we had established at the outset of our analyses. As a result of our axial coding, then, we decided to focus particularly on the category of everyday funds as our main (or axial) category, with the other categories revolving around everyday funds.

During axial coding we found ourselves analyzing ways that knowledges and Discourses were distinct, despite our initial decision to collapse them into one category for the purpose of analysis. Youth, for example, often knew music artists and their style of music, much as they might know the differences among a molecule, compound, and element. How they came to know those artists; distinguished among music styles; and talked, read, and wrote about the artists and their music, however, were distinct from the knowledge that they held about music. Moreover, their music Discourses were both distinct from and similar to the Discourses around knowledge of scientific concepts. These differences and similarities in knowledges and Discourses, we contend, may be one key to developing the three kinds of third space presented previously.

With this axial category established and with a focus on how knowledges and Discourses might be different, we moved into selective coding, returning to our data sets and reading and rereading the data with a focus on everyday funds and their relationship to students' understanding of science concepts, images of science, and school funds. We also analyzed the data with the question of how everyday funds and texts shape readings and writings of school texts. As we examined different data sets, we noted that many exemplars of one category also contained evidence of funds of knowledge and Discourse relevant to other categories, particularly as we examined the data related to peer interactions and popular cultural texts.

This finding, rather than suggesting to us that we needed to collapse categories, led to an important understanding of the nature of these everyday funds. Specifically, what we categorized as one fund invariably could be seen mediating and being mediated by other funds youth typically drew from or constructed in their everyday lives (cf. Nespor, 1997, p. 171, for a discussion of what he terms "heterogeneous funds"). For example, a fund drawn on extensively by the young men in our study was membership in *car clubs*. This particular fund was mediated by *family* funds, as fathers and uncles participated in these clubs; by *peer* funds as youth spent time together in the clubs; and by *popular cultural funds*, as youth

pored over automotive magazines during their free time together. And, as mentioned in the previous paragraph, our data also suggest that these funds at times shaped the ways that students made sense of school texts.

With these categories developed, we returned to our research question and to our tripartite models of content literacy learning and third space. We present the different funds according to the analytic categories previously outlined, but we also examine how they might be used to construct different aspects of third space. That is, in some cases, youths' funds reveal the science of everyday life, providing both a bridge to conventional science learning and a site for explicit discussion of the conventions of the texts of different discourse communities. In other cases, students' funds challenge conventional science or provide tools for expanding what counts as knowledge of the natural world.

In our presentation of findings in the following section, we provide exemplars from our data that illustrate these different possibilities. We attempt to illustrate that multiple aspects of third space can be constructed with any of the funds that students bring to school from their everyday worlds. In our subsequent conclusions we turn to a discussion of patterns across the different funds of knowledge and Discourse, offering some considerations for literacy practices in content areas.

Findings: Science of the everyday and the everyday of science

In this section we present analyses of the funds to which students had access in and out of school within the four categories outlined previously: (a) family, (b) community, (c) peer groups, and (d) popular culture. In each case we attempt to connect the everyday funds to the classroom science funds students encountered. In some cases, however, we explored knowledge and Discourse funds that appeared to be extremely important to youths' daily lives but that did not appear to be obviously connected to classroom scientific literacy learning. We include a discussion of these funds because they appeared so often and with such force in the everyday lives of the youth, and because we are not willing to dismiss funds as unimportant simply because the connections to school disciplinary learning are not immediately evident to us.

Family funds of knowledge and Discourse

We found, as Moll and his colleagues have found (Moll, 1992; Moll et al., 1989), that home-based funds usually revolved around the work parents did in and out of their homes. We also found, however, that a significant number of the youth mentioned travel across and within countries, as well as health concerns—a point related to their transnational movements.

Parents' work outside of the home

As we discussed some of the environmental issues embedded in the air and water quality curricula, a third of our students mentioned their fathers' work as landscapers or farmers, particularly in relation to issues of water quality. For example, when we talked with a group of young women in a focus group interview about why it would be important to know about water quality, Valeria mentioned her father's work as a landscaper and how water use affected his work. Pilar chimed in to say that her father was also a landscaper: "He talks about the water in Detroit and about how much rain we get and stuff like that."

In a different focus group interview, also with young women, Alicia and Brenda spoke of mescal farms their families owned in Mexico:

Alicia: My dad had the land there [Mexico] but he sold the things to make tequila. Now the roots are coming out, but they keep stealing my dad's beans—the roots.

Interviewer: The roots? What do you mean?

Alicia: Sometimes when the roots come out they pop out. They're like this thing they call mescal where they make tequila. And the roots were left—

Brenda: They steal them!

Interviewer: They steal them? You mean like they dig them up and take them?

Brenda: Yeah, it's just like, those are like gold in Mexico. They're like more than a million dollars.

These young women understood from their family life some aspects of the mescal farming process that might be relevant for thinking about air and water quality. They also recognized, perhaps overestimated, the economic importance of following the processes and protecting the investment of their plants. In addition, these funds of knowledge are embedded in historical and cultural practices that place both economic and social value on mescal in Mexican society. Although the youth themselves do not speak about these practices, their familiarity with the value placed on the growing of mescal suggests that these home funds have possible cultural, historical, economic, and scientific connections. Furthermore, their funds of knowledge had a transnational or global quality because they were based not only in two nations but also in two interdependent economic systems, reminding our team that everyday knowledges are often diverse and far ranging, even when drawn from home experiences. What makes this finding particularly interesting is that whereas the science of the curriculum attempted to draw on youths' experiences in *local* spaces, we found that *all* students interviewed spoke of immediate or extended family relationships and work practices that crossed state and national boundaries.

In a similar manner, youths' families worked in dry-cleaning establishments, construction sites, and auto plants, all industries with direct connections to community air- and water-quality issues, and each of which youth referred to when asked about whether they saw connections between the science units and their families' lives. For example, when asked to write a response to the question, "What would happen if a factory closed in your community?" (because of air-quality violations), several of the students in a class wrote about family members (usually males) losing jobs. Their responses indicate that the youth, drawing from their home funds of knowledge, were aware of the economic and social consequences of scientific activity, a point that could be further developed in the science curricula and that could inform the generation of knowledge beyond simple analyses of amounts of pollutants in air and water.

Specifically, these exemplars represent an important way that third space can move beyond merely connecting to students' prior knowledges. The funds of landscaping, farming, dry cleaning, and other types of employment are directly relevant to the scientific concepts under study in both air- and water-quality units, but such concepts are rarely framed in the economic and cultural funds to which these youth have access. However, we noted that the Latino science teacher, who had a strong chemistry background, did routinely ask students to think about the economic implications of air- and water-quality standards. In general, though, the science of air quality was left uninformed by the specific experiences of the youth. As these youth were reading and writing classroom texts about water cycles and molecular structures of pollutants, their parents' work lives—and the economic and scientific conditions of their work—were absent from the

conversations. Bringing these knowledges into class-room conversations would not only build bridges between students' out-of-school experiences and the target content knowledges but also expand the target content knowledges to encompass a wider range of implications for scientific concepts. When a space is opened for students and their parents to contribute the knowledges they have generated from work funds, a space could be opened for them to challenge the claims made by scientists about air and water quality or other scientific concepts.

Despite these connections, we did not observe students raising such employment connections with their teachers during class discussions, lectures, or activities, except in instances similar to the one identified above, when one teacher included such reflections as part of his writing assignments for the unit. Otherwise, any data we gathered about parents' employment related to the science of the curriculum came from our team's formal and informal, individual and focus group interviews with the youth.

Work in the home

Other science-related and home-based funds of knowledge and Discourse include domestic activities such as cooking, cleaning, and engaging in ethnic and cultural traditions. As we found with students' references to their parents' work, we learned about domestic activities only during interviews and observations in their homes. For example, data collected in homes demonstrate a number of different cooking procedures that could be useful funds to integrate everyday and scientific conceptions of particular phenomena. In one exemplar, a mother explained the process of sweating chilies to one of the researchers. The process, in which chilies are placed in a plastic bag until their skins sweat loose, provides concrete and home-based examples of the processes of condensation and evaporation—concepts of the water cycle studied as part of the water-quality curriculum.

In a similar manner, in an informal interview whispered during a lesson on complete and incomplete combustion, a seventh-grade girl used the frying of tortillas to explain her argument that smoke was not white, as the teacher had claimed, but black:

Teacher: ...and that's why smoke is always white.

Tana (under her breath): No, it's not. It's black.

Interviewer (whispered): Why do you say that?

Tana: Like, when you fry tortillas, you flip them over and they have black stuff on them. That's from the burning.

Although Tana's knowledge of the "black stuff" on tortillas does not directly dispute the claim that smoke is always white (an overstated claim because the color of smoke depends on the composition of the material being burned), this exemplar illustrates that Tana drew upon home-based funds of knowledge to challenge for herself a claim made by a teacher in the classroom. Had the teacher heard this whispered comment, he could have used Tana's knowledge of the "black stuff" produced in burning to clarify his point and to extend the discussion on combustion. He could have acknowledged the possibility for engaging in scientific observation and explanation in everyday activities. Such a pedagogical move would resemble those Gutiérrez, Baquedano-López, Tejeda, et al. (1999) illustrated in their analyses of an elementary teacher bringing students' counterscripts to bear on official classroom scripts during a health-science lesson.

In addition, encouraging Tana to bring this knowledge forward could go beyond building a bridge for her to cross from everyday to academic knowledges. If the teacher could have heard Tana and encouraged her to offer her observation, he could have communicated to her and to other students that what they know is relevant and has a place in the classroom, even when it challenges what appears to be conventional science knowledges or Discourses. Such a move would help Tana and others see that their observations are valid ways of knowing and making claims about the natural world, even when framed in everyday Discourses or knowledges.

These moments in which youth called up domestic activities could be used to construct all three of the types of third space we have imagined. First, students could make concrete connections from domestic activities to specific scientific concepts (e.g., the water cycle), thus serving as bridges from everyday to academic knowledges and as scaffolds for students' readings of classroom texts. In addition, a discussion of when, how, and why certain labels and categorizations could prove both useful and extraneous could serve as a tool for building a navigational third space—a space, in other words, in which young people come to understand the conventions and practices of different discourse communities. Such understandings might also shape how they read and write texts across a variety of school and everyday contexts. Finally, these activities, not routinely valued as part of the Discourse of science whether as

discipline, profession, or classroom content (Lemke, 1990; Popper, 1988), could serve to challenge academic or scientific knowledges by illustrating that much of what is valued as *scientific* grows out of and is informed by everyday practice. Such a move could integrate, rather than divide, everyday and academic knowledges and could reshape how and why young people approach the content texts of their classrooms. In addition, students could question the value of naming and categorization of natural processes (e.g., the water cycle), particularly for life in the world. Holding science to the standard of living in the everyday world is one way of challenging some of the privilege of science without necessarily dismissing its value in certain spaces, relationships, times, or activities.

Travel across countries

All of the youth interviewed spoke about national or transnational travel that provided them with funds in different physical spaces. For example, when discussing water quality in rivers, two young women spoke about water pollution along the Mississippi and the Rio Grande rivers. In fact, they appeared to be more familiar with these water sites than they were with the local watershed and the river under study in the curriculum, making claims such as, "We pass the Mississippi when we go to Texas every year." Another young woman, Viviana, wrote about evidence of erosion that she had seen on beaches while visiting her family home in Acapulco. The following is her journal entry (spelling and punctuation intact):

> I was in Mexico, Acapulco and I was swiming and my mom told us to look at the funny rock and she told us to observ it becaue we were going to be ther for a month and half and the water made a smohte dent in it. How? because the water dessolved it and it was already making a dent. And meen while we were there it made a deepe dent and we took it home for a memory.

Viviana's experiences in multiple geographic locations served as funds of knowledge about processes of erosion (among other scientific concepts). So also did Viviana's interactions with her mother. Her mother's exhortation to "observe" the rock over time modeled the basis of a scientific Discourse for Viviana. By taking "the rock home for a memory," Viviana and her family possessed not only memories of the time spent in Acapulco but also funds of knowledge and Discourse to draw from in school-based science learning. The Discourse of Viviana's mother serves to deconstruct the binary between

everyday and academic Discourses. Viviana's mother, although perhaps not invested in an established scientific Discourse community, demonstrated her awareness of the importance of observation, time, and preservation of artifacts in understanding and explaining natural phenomena. Again, valuing the text that Viviana constructed would signal to her and to other students that everyday observation is as important as the kind of observation they were learning to do in the classroom and that, in fact, it bears strong resemblance to that of academic science. As a consequence, science as a Discourse community could lose some of its mystique and privilege, a move that deconstructs the boundary between the academic and the everyday and simultaneously makes spaces for other ways of knowing. In addition, Viviana could have learned that her ideas and her mother's have meaning and relevance across a variety of spaces, from the vacation space of Acapulco to the classroom space of Detroit.

Viviana's home Discourse was not unique to her: All of the other youth interviewed demonstrated similar understandings of and Discourses about natural phenomena. For example, each of the nine youths who had lived or spent extended periods in Mexico City also talked about pollution there, and four of them explained their emigration to the United States in terms of their families' desire to find better physical, as well as economic, living conditions. In particular, although all of the youth indicated some dissatisfaction with air quality as part of the curricular activities, approximately one third of the youth interviewed mentioned that they or a family member suffered from asthma either in Mexico City or in Detroit. The emphasis on environmental conditions and health concerns across nations was prominent enough to warrant its own subcategory within family funds of knowledge.

Environment and health funds

With only a few exceptions, the youth and their families had experienced environmental problems in their home countries or places of origin in the United States, as well as in their current community. For many of the youth, in fact, migration to other communities within the United States or within their countries of origin was prompted in part by environmental quality concerns. At the end of one year, in a formal interview, Juan revealed that his future goal was to become an ecologist so that he could change the quality of air in the world because he had been personally affected by poor air quality.

Interviewer: You had mentioned to me that you wanted to be an ecologist. Can you tell me more about that?

Juan: I would like to be an ecologist to take care of forests because there are many animals that are dying. And there is so much pollution like in Mexico City.

Interviewer: You were in Mexico City?

Juan: I was there but I got sick because of the pollution.

Interviewer: What did you have?

Juan: Like asthma but worse. So we moved to Ixtapaziguata.

Juan's experience with asthma and with air quality served as a fund of knowledge that implicitly supported his learning during the air-quality unit in class. In the subsequent unit on water quality, he was motivated to learn the concepts because he cared about changing the environment—again, a consequence of his own experience. We did not observe Juan's experience elicited, however, during classroom lessons. Thus, his experience with the environment served as a fund of knowledge that supported and motivated his learning, but it was not invoked or elicited in classroom practice, nor was it used to challenge or question the data the class accessed while they moving through the curriculum.

In addition, all youths interviewed indicated that they consider the quality of air and water in their current community to be substandard, although they often rated it as superior to their previous communities. This finding has salience for their reading and writing activities in the science units that we observed. Although the youth find the air and water quality of this community below par, the Environmental Protection Agency's National Ambient Air Quality Standards (EPA NAAQS) describe air quality in the city to be within acceptable ranges (www.epa.gov/ttn/naaqs, 2003), which the youth learned as they did Internet-based research on the air quality of different cities throughout the United States. How did the youth reconcile the data presented in the curriculum activities with their own experiences of living with "dirty-looking air," "bad smells," and high incidences of asthma, all of which they reported on community surveys and concept maps as they began the unit? How did they make sense of the ongoing movement by community members to protest different industrial pollutants in their neighborhoods? Conversations about such issues would be another way of opening third spaces in which scientific findings and experiences are examined in relation to one another, with neither fund being privileged but both being valued.

It is important to note that the goal of constructing third space is not necessarily about reconciling differences in everyday and academic knowledges, just as it is not only about correcting or improving different funds, although any of these may occur. The goal of constructing third space is not to teach youth that academic or everyday funds are more right or more wrong but simply to make a space for multiple forms of knowledges and Discourses in the interpretation of classroom texts. Thus, when reading the data table on whether Detroit meets the EPA air-quality standards, a student whose knowledges have been brought into the conversation with these data might legitimately conclude that although the EPA claims that Detroit air quality is, on average, within appropriate limits, an individual person's or even a whole community's definition of air quality may differ from the EPA because the individual or community is not willing to live with foul-smelling or dirty-looking air. Students might also, for example, raise questions about *how* the EPA averages of such a sprawling city are calculated, wondering whether the clean air in one neighborhood—one with fewer factories and more green spaces—averages out the pollutant levels in more industrial neighborhoods. Such conversations and reading and writing practices only can be made available as young people's funds of knowledge and Discourse are better understood and accessed in classroom spaces. Most compelling about this approach is that it requires that youth and their teachers engage with both conventional science funds and everyday funds in order to make reasoned and data-based evaluations of the knowledges and Discourses that produce the texts they read and write.

Community funds of knowledge and Discourse

Community leaders described the community as committed to positive ethnic identity and the maintenance of a thriving community. Our community observations support this assessment. An overall analysis of the dominant fund of knowledge offered by the community is one of a strong ethnic identity, a commitment to helping youth achieve educational and economic success, and a commitment to social and community activism.

The existence of the school represented in this study is perhaps one of the clearest pieces of evidence of the community's activist orientation. Community members developed the two-way bilingual immersion public school of choice to provide children and

youth with access to English-language and literacy learning while maintaining and developing Spanish language and literacy. The existence of the school indicates a community commitment to the maintenance of ethnic identities and cultural practices, as well as to developing hybrid practices for achieving economic and social success in the United States.

Charter and private schools also provide evidence of community activism. One charter offers a Chicano/a-centered education to its students. Another recently opened all-girls charter is dedicated to the education of middle school Latinas. A large Hispanic Roman Catholic church in the community also offers a private, K–12 education. In addition to these numerous formal educational options, a number of different community-based educational organizations exist in the area. A Latino/a branch of the public library offers what community members consider a rich collection of Latino/a and Chicano/a literature. Several youth programs are in operation at various community-based organizations, and the largest of the Hispanic Catholic churches in the community offers numerous after-school and summer enrichment programs for youth, including Spanish classes.

How might strong ethnic identity and Discourses of social activism serve as funds for scientific literacy learning? We have documented some political and social interventions led by community members against environmental infractions of industries in the immediate community. For example, community leaders have actively and successfully protested the building of an elementary school on a toxic waste site. As part of this protest, community members attended a series of meetings with school board officials, they wrote letters to city leaders, and they published editorials speaking out against the use of the site.

A second exemplar illustrates another connection from activism to science learning. A neighborhood alliance distributed a written survey on the quality of air as information gathering for a lawsuit against an industry that operates in the neighborhood surrounding the school. The use of a written text as a standard research instrument (the survey) connects the Discourse of scientific inquiry with the community's Discourse of social activism, particularly because one of the activities of the curriculum in past years had been to survey community members on their views of air quality. Through the community survey efforts, community members modeled for youth the value of engaging in inquiry, and they modeled the textual and physical tools for engaging in inquiry. All students in the school were asked to take the surveys home to parents and thus saw evidence of community members using literacy and discursive tools valued by the disciplines to become involved in science-related community action. In addition, claims about poor air quality lodged in the suit stood in direct contrast to much of what the youth were learning in their science class.

In sum, our analyses of community data indicate that the community has a sense of collective struggle and community activism; its leaders model for youth the tools and the Discourse necessary for engaging in activism; and the tools and Discourse of activism have strong links to those privileged in science and other content area classrooms. Our data also suggest that at least some of the youth have taken up this Discourse, as indicated in their comments during interviews about how census data should be used to benefit the community. In addition, our data include observations, interviews, and artifacts collected in relation to an organized protest by 35 of the middle school youth against what they considered unfair layoffs of uncertified bilingual teachers (see Moje & Ciechanowski, 2002).

Thus, our analyses indicated that Discourses of ethnic identity and social activism are community funds and that, in at least some cases, youth are hearing and enacting these Discourses. The literacy practices required in project-based science and other content area curricula that are designed to engage youth in inquiry around real-world questions could be supported, deepened, expanded, and even challenged by linking to the community's funds of knowledge about how to engage in social action related to community environmental and health concerns. Such action-oriented approaches to science literacy learning could open a third space as students apply the science concepts they read and write about to actual community concerns and as they use community knowledges to challenge some of the scientific findings and concepts they encounter in the curriculum. Using the community lawsuit to examine the EPA's air-quality data, for example, represents a third space in which two different funds of knowledge are considered simultaneously.

Peer funds of knowledge and Discourse

Although we did not initiate this study with the intent to examine peer funds, we began to explore this category as we analyzed our in-school data. Our analysis suggested that peers played an important role in helping youth know how to "do" school and how to read and write school-based texts. This finding seemed particularly salient in this cultural

context in which a few students (approximately three to five each year) are recent arrivals to the United States and a larger number had started schooling there within the previous two to three years. We observed, for example, fluent English speakers translating for or coaching Spanish-dominant students. It is not surprising that this occurred most often in classes with non-Spanish-speaking Anglo teachers. One young man, Mario S., explained to more than one member of the research team and to teachers at the school that another student was "shy" about speaking English. In one instance, Mario S. volunteered to read so that the other student would not have to read aloud in English. In other instances we watched students explain to one another how to complete worksheets and other written work quickly and efficiently. For example, a student encouraged another not to bother with a particular part of the worksheet because it was not important, an indicator of some Discourse of "studenting" (Kelly & Green, 1998) and "doing" school at work in peer funds, as well as an indication of the role of peer funds in negotiating written texts of the content area.

Informal peer activities

As we deliberated about whether peers could be counted as a fund of knowledge and Discourse in the ways described by Moll (1992), we began to look more closely at the youths' out-of-school activities with peers. We found that, unlike younger children, these youth spent a great deal of time together in activities often unmediated by adults. For example, performing dramatic stunts as they rode bikes around their neighborhoods filled much of the time out of school for male participants. The dominance of such activity among the male participants became evident when students were asked to write about their experiences with bike riding during the curriculum unit that examined the physics of wearing a bike helmet. The male students in the class clamored to read aloud the stories they had written about their exploits of daring and risk, such as Marco's: "I was riding my bike down a hill, hit a bump, and tried to grab a tree, but the branch broke!" Others told or read stories of riding with three to four boys on a bike and of performing daring stunts.

These peer activities seem especially relevant to the goal of developing third space. In several interviews the youth made comments such as, "This unit [on the physics of wearing bike helmets] is interesting, but I don't need to do an experiment to know why I need to wear a bike helmet." More to the point, the youths, usually males, continued, "And

I'm not gonna wear one, anyway," citing reasons such as "It looks stupid" or "They're hot and uncomfortable." Their exploits revealed a sense of risk taking and free play in the everyday world that resisted a scientific analysis. This is not to say that the youths were unable to make connections among their real-world cycling experiences and concepts such as force and motion, but that they actively resisted science in this case as relevant to decisions they might make about bike riding. In Bhabha's (1994) view, they were already producing hybridity simply through their simultaneous resistance to and accommodation with their science classroom activities. Although we agree that all moves to make sense of the world construct hybridity at some level, our view of third space suggests that such hybridity could be brought into the open to resituate often marginalized experiences and to develop conversations about the relative value of scientific, abstracted knowledges vis-à-vis personal, experienced knowledges.

Another typical practice unmediated by adults was to simply "mess around" as described by Jaime in this interview:

Interviewer: What do you like to do after school?

Jaime: Mess around.

Interviewer: Like what?

Jaime: Mess around with people.

Interviewer: Hang out.

Jaime: Yeah.

Interviewer: Where do you hang out?

Jaime: At the park. At home sometimes.

Interviewer: What hobbies do you have?

Jaime: Like [video games], ride bike, roller blades, a whole bunch of things.

Later in the interview, Jaime repeated that he liked to go to the park in his free time and swim at the wave pool. He acknowledged that he sometimes, although not frequently, went to the library.

Although these data are likely to seem unremarkable to most readers, we include this category as a fund of knowledge and Discourse because it is during this peer "messing around" time that youth engage with one another about popular cultural, community, and family funds. They exchanged written texts of favored music groups (e.g., lyrics, liner notes, or news articles), music or automotive magazines, and notes written as they watched television and movies alone at home. Young women, for example, appeared to spend a great deal of time to-

gether listening to, reading about, and writing about music and television programs, particularly *novelas* (soap operas). The young men listened to music as well, but the young women kept journals about their music favorites, wrote notes to one another, and spent time dancing to different kinds of music. Walking through the mall and going to movies were also popular activities, but the absence of a shopping mall or movie theater in the immediate neighborhoods of their community, combined with the poor mass transit system of the city, restricted the youths' access to such activities. When we accompanied students on such outings, however, we found that their choices of shops and movies reflected ever-changing popular cultural trends, another important fund of knowledge and Discourse. Surfing the Internet was also a popular "messing around" activity, which often required that the youth gather at the public library or at the home of one youth who had Internet access.

As described by a number of scholars (e.g., Alvermann, 2001; Finders, 1997; Hartman, 1997; Lewis & Fabos, 1999; Mahiri, 2002; Nespor, 1997), the "messing around" that Jaime described in the previous interview is replete with social purpose and literate practice, although it is often positioned as an aimless, or even problematic, activity. What makes this category relevant to our study is that the activities youth engage in when "messing around" often have some direct relevance to scientific and other content area literacy learning, particularly as the youth engage in Discursive practices similar to those demanded in school content areas, such as making claims and providing warrant for choices of music, media, and clothing. It is in these activities, often unmediated by adults, that they teach one another concepts and practice forms of Discourse that are unique to youth culture. They learn, for example, the music that is considered popular, the forms of language that are acceptable, and how to make signs and written symbols that will be read in particular ways by other youth. In particular, as they spend time on the Internet together, they learn and refine search techniques that could serve them well in school. For example, when asked where they had learned a variety of hand signs for musical groups, street gangs, and their own groups, the following conversation ensued.

Interviewer: How do you know all this?

Pilar: Internet.

Alexandra: Yeah.

Pilar: I remember, I got a 12-page thing on the National Association of Gang Investigators—

Interviewer: Off the Internet?

Pilar: Yeah, National Investigators of, National Investigators of Gang.... No, National Gang Association Investigators, something like that.

Interviewer: Off the Internet?

Pilar: Yeah. And then on Latino gangs—

Alexandra: Go under Sureños [a gang set], they'll give you *so* much information, how it started, they got it down.

Pilar: Yeah, they gave me a 12-page thing, and I read all of it and it said that at first...[inaudible] they were started in jails, because the northern jails were in with the southern jails....

Their comments about the texts and their accuracy, as well as their knowledge of how to navigate search engines, illustrate that these young women possess, in some form, the Discursive and rhetorical skills necessary to search for, comprehend, and critique texts. Further, the exchange, although stimulated by the interview process, hints at how peers might exchange information and discursive skills as they "mess around" during peer interactions, thus serving as an important fund of knowledge and Discourse for one another— fund that could be employed to access and challenge conventional science texts. One of the teaching challenges we have observed, for example, in a number of science classrooms in our larger project, revolves around using Internet search tools to locate information relevant to the curriculum under study. The challenges include students' abilities to engage in basic keyboarding and their abilities to engage in searches for information. The data exemplar presented here suggests that students may possess the ways of knowing, reading, and writing necessary for information technology manipulation related to texts that are connected to their dominant funds of knowledge (e.g., peer social networks), but they do not know how to apply these skills to texts connected to other funds of knowledge (e.g., EPA studies of air quality). Beginning lessons on how to conduct Internet searches for science information with examples drawn from youths' everyday practices would not only bridge their out-of-school knowledges and strategies to in-school activities, but also serve to demonstrate in explicit ways how different Discourse communities rely on different communication conventions (e.g., print codes, icons, and lexicons). Such activities do more than simply link new to known or support transfer across contexts

(although they do support both); they also make differences explicit and can potentially underscore the usefulness and arbitrariness of the differences among discourse communities as young people examine how different communities make rules about how to talk, read, and write.

Viviana is the one young woman interviewed thus far who seemed to be regularly engaged in highly structured activities mediated by adults, thus representing what might be labeled a discrepant case (Patton, 1990). She described attending folk-dance classes, drama classes, and art classes. She also had enrolled in a summer reading program at the local Hispanic branch library but was forced to withdraw when her grades and test scores required her to attend summer school for one entire summer. Such extensive participation in organized activities has not been typical of any of the other youth in our study (although it seems obvious from the availability of such activities that other youth in the community must be engaged in structured activities). However, even Viviana spent a fair amount of time in "messing around" activities. For example, when asked why she aspired to be an archaeologist, Viviana described one of her favorite activities, digging for things in the backyard or park:

Interviewer: Why do you want to be an archaeologist?

Viviana: Because you get to explore places and you get to dig 'em up. You have to be careful with them.... I just think it would be fun.

Interviewer: Why would you want to explore? What makes exploring interesting?

Viviana: 'Cuz you find different stuff. Like when sometimes I go in the backyard, and I dig up, I find different stuff than I do in the park.

Interviewer: Now, that's interesting.

Viviana: Me and my friend, Victoria, did that.

Interviewer: Why two different places?

Viviana: Because I don't know, we started to look in the park one time because I lost my earring and it has little wood chips in the park and we started taking all the wood parts out. And we, it was like, we kept digging and digging, and we found a whole bunch of stuff. I remember we found a gold chain.

As Viviana and the interviewer continued to talk, Viviana revealed a Discourse of hypothesizing about the items' origins and providing warrant for those hypotheses. As she explained, "We thought it was a baby...because it was little and thin.... But I was talking about maybe a baby boy." Viviana's free-

dom to explore, coupled perhaps with her mother's modeling of scientific Discourse (see previous exemplar of Viviana's journal entry about an eroded rock), encouraged Viviana to explore the natural world. What is critical to the question of developing third space in relation to content learning is the realization that despite Viviana's facility with Discourse that could easily be connected to scientific Discourse, Viviana saw her explorations as unrelated to science:

Interviewer: Do you ever get that sense from your school science that that's what science is, exploring and explaining?

Viviana: No.

Interviewer: Can you think of an instance when you got that impression?

Viviana: Not in science class. But in social studies we were doing a project of archaeologists.

Viviana went on to explain that her social studies teacher asked them to construct a time capsule and asked them to write and talk about the items in the capsule in historic and futuristic terms. Thus, her "messing around" connected to her learning of social studies concepts and Discourse but not, in her view, to science Discourse or concepts. Viviana, like all of the other youth in our sample, generally saw her knowledges and Discourses outside of school as distinct from the reading, writing, and learning she was expected to do in school. Seeing these knowledges and Discourses as distinct made it unlikely that Viviana would often bring them to bear on others either in or out of school. Despite her scientific approach to understanding the world, Viviana seemed to see the classroom as a space for the official Discourse of science rather than as a space where her everyday explorations could stand side by side with (and inform) the scientific concepts and Discourses she encountered in her classroom.

Formal peer activities

Other more formal peer activities mediated by adults have knowledge-based connections to scientific literacy learning and also offer the potential to build navigational and challenging third spaces. For example, another free-time activity popular among the male youth and especially relevant to scientific literacy learning involves working on cars and participating in car clubs, usually with brothers, uncles, or peers. In one interview, Cesar told of being part of a car club with his uncle:

Me and my uncle are in a car club. This car club is from like Los Angeles, but it's also here...and like so, he has a low rider, and so we were fixing it because it has to have a good sound system, has to...had to...have to...has to have a good hydraulic system, good paint job, has to be like good...enough so we can show it. So right now we're like...with...they know us, but we're not with them because we still need to fix it up.

Cesar's listing of the different properties required to show a car in the car show illustrates his awareness of the qualities or properties of a good car by car club standards. That is, Cesar demonstrated the standards for warrant by which assessments of quality are made in a car club fund of knowledge and Discourse. Thus, Cesar's experience with the car club provides him with a Discourse as well as a knowledge base for making and substantiating claims, albeit of a different nature than those made in science, but claims nonetheless.

Several other male youth also spoke of working on cars, and one student, Ángel, wrote in his in-class journal about building a go-cart with his brother. Ángel spoke of the go-cart experiences as an "experiment" and saw it as having a specific relationship to science, and he offered it in response to a journal prompt about experiments. The youths also read car magazines and websites such as *Lowrider* (magazine), www.lowrider.com, and www.fastandfurious.com, in support of their car club activities. Moll and colleagues (Moll, 1992; Moll & Greenberg, 1990; Moll et al., 1989) have described the important connections to science learning that young children can make as a result of working on and exploring automobiles with adults. Our data indicate that the male youth in our study have similar funds of knowledge, as well as funds of Discourse, based in family and peer networks, that could be integrated into deep science learning in ways that allow students to develop conventional science knowledges and Discourses while simultaneously valuing and further developing their everyday knowledges of cars and their connections to male elders. Moll and his colleagues argued that bringing such experiences into the classroom not only constructs a third space that bridges everyday and academic funds but also allows for often-marginalized voices to enter conversations about classroom science. Further, these funds may provide opportunities to demonstrate how people negotiate different discourse communities and, possibly, how people might challenge conventional scientific concepts that might be proven irrelevant or inaccurate when framed in everyday, experiential knowledges.

Popular cultural funds of knowledge and Discourse

The final category we present represents the primary fund of knowledge and Discourse that we observed students employing in their everyday interactions and in their science classrooms. By primary, we mean that we observed youth spending the majority of the time we were with them engaging with and talking, reading, and writing about various forms of popular culture. Perhaps because the youth with whom we worked were all bilingual and generally biliterate, we did not find the problems relating to lack of familiarity with popular culture that Duff (2002) discussed in her study of second-language learners. In fact, one of the most notable findings in this area, in addition to the strength of the popular cultural funds relative to other funds students talked about, is that youth tended to draw on popular culture as much as, if not more than, they did their own experiences when discussing issues related to the science curricula under study (cf. Nespor, 1997, for discussion of similar findings). In addition, we found that youth mediated their choices of popular cultural texts with their family, community, and peer funds of knowledge and Discourse. This category, as dominant in our data corpus as it is, presents both the greatest urgency and challenge to content literacy educators interested in constructing third spaces. Few researchers of science, mathematics, or social studies have written about linking popular culture funds to advanced content learning in sustained ways (see Elmesky, 2001, for one example). Our data suggest that one way to develop third spaces between academic science funds and popular cultural funds that youth access is to examine discursive strategies that the funds do and do not share.

Music

Although not obviously related to science learning, the strongest category of popular funds of knowledge and Discourse is the category of music. Data from observations and interviews indicate that the youth relied heavily on music as a fund that shapes and represents the texts they read and write, as well as the identities they enact in different spaces. The choices of music included *pop Latino*, gangster rap, and traditional Mexican folk music, with some of the youth enjoying a wide range of these musical texts and others focusing on one or another form of these texts. In one of the most explicit discussions of what these texts mean to her, Pilar, in an informal phone interview, played different songs over the

phone, arranging her headphones so that she and the researcher could both hear the music, but so that they could also both hear each other. Then she narrated the songs, describing the types of music and commenting on the juxtaposition of different musical texts in her portfolio:

> We're gonna play our CDs, you can hear them. We'll be like, "This is Mexican. This is rap." They're like totally different. I got Juvenile: "I Got Da Fire." Right next to that I've got Intocable. They're right next to each other.... O-Town sings a slow song, "All or Nothing." Right next to it I've got Pegaso [the group's name].

These texts, then, provided her with Discourses for displaying, claiming, and building different identities in particular spaces, and at times, as illustrated in the interview, an explicitly hybrid identity in the sense that she drew from many different everyday funds of knowledge and Discourse.

The music also called up certain kinds of literacy practices. As Yolanda explained in an informal interview, she writes her favorite quotes from songs by OV7, Backstreet Boys, and Fey while she watches television at home. She claimed that she writes the quotes because "she has nothing else to do." Our field notes indicate, however, that the girls often played games during lunch with the different quotes from music, which suggests that the written quotes served as fodder for sustaining social practices and relationships across multiple spaces. To play the game, they read aloud the quotes that one had written, and they tried to see who could most quickly guess the artist who sang the song. At home, they told us, they played CDs and competed over the phone to be the first to guess the name of the song and the artist who sings it. On interviews that took us to retail centers, the youth—both female and male—always stopped in at least one music store and spent, on average, 20–30 minutes browsing through CDs and music posters. One young woman took care on one outing not to reveal her preference for music that others in the group dismissed as out of fashion. In short, music provided a resource for conversation, for identity enactments, and for literacy practices.

At least half of our female participants faithfully read music magazines both in and out of school. They cut photos out of the magazines to decorate their notebooks, journals, and lockers; they read the articles and discussed them; they wrote notes to one another about the articles; and they shared the articles with one another and with other young women. They subscribed to the Internet, constructing URLs from the names of their favorite musical groups, and

they searched the Internet regularly for information about those groups. Although male participants did not engage as openly in such literate behaviors around music, they did carry CD cases with extensive collections of music. During one informal interview, Mario C. described each of his CDs for one of the researchers, categorizing different CDs according to music type and artist.

Given the wealth of data in this subcategory, we coded music the dominant popular cultural fund of knowledge and Discourse in the everyday lives of these youth, particularly because music is tied to other subcategories, such as magazines and television, film, and news media. Music served as an activity, an identifier, a source of conversation, and as a dominant source of literacy practice. Most important to our research, each of the practices described above requires literate and discursive skills that could be mobilized as bridges to conventional content literacy learning, as navigational tools for examining different discourse communities and learning different skills, and as tools for challenging and reshaping representations of the world in science and in popular culture. How, teachers might ask students, do you know the differences among categories of music? Why can a listener detect that one piece of music is Mexican and another rap? Why, students might be encouraged to ask, are claims about music made differently from claims about scientific data; are such claims always made differently; and are there times when the same standards apply? When and how, if at all, might the practices of discerning types of popular culture inform or reshape the practices of science?

Print magazines

Observations and interview data suggest that magazines were the most popular and prevalent form of connected prose read by these youth. In fact, on only three occasions have we observed female participants carrying novels not assigned for school, but we have seen young women and some young men carrying magazines on an almost daily basis.

As indicated previously, young women regularly read and carried with them fan magazines about music groups and pop stars, and young men also reported that they read magazines about cars in their free time (e.g., *Lowrider*), and they talked about the cars during interviews. We have not, however, observed any of the male participants actually reading, or even carrying, these magazines with them in or out of school in the same way that we have seen young women carry, read from, consult, share, and clip magazines in and out of school. We are

beginning to observe them, however, using and referring to Internet sites more and more frequently. In fact, a common question to all research team members in the last year as we pull out our laptops to take field notes is, "Do you have the Internet on that?" This electronic print source may be replacing conventional paper magazines.

News media

Another important popular cultural fund is news media. Across our data, when asked how they obtained information, youth most often referred to Univision (a Hispanic television channel presented in Spanish and broadcast throughout the United States, Mexico, and some parts of Central and Latin America) and Fox News (a network news broadcast in the United States). In Juan's interview, he stated specifically that he watched only Spanish channels and that he obtained news information from them:

Interviewer 1: I recently found out that gas stations are the biggest polluters of the water table. You know how there is plumbing below gas stations, the gas seeps, how do you say seep?

Juan: Goes through.

Interviewer 1: goes through the ground and you know how there is water below the surface?

Juan nods.

Interviewer 1: [It] connects to rivers and lakes, so the pollution ends up there.

Juan: I heard about that.

Interviewer 1: Oh, yeah? Where?

Juan: In the news.

Interviewer 1: It's a problem. But why don't we taste gas when we drink our water?

Juan: There is not a lot.

Interviewer 1: Oh, there is not a lot of gas, so that is why we don't taste it. (Interviewer 1 nods.)

Interviewer 2: Which news programs do you watch?

Juan: Primer Impacto and Noticiero Univision.

Interviewer 2: What does Univision cover?

Juan: The whole world.

Several different youth also reported that they listen to a Mexican radio station that is only on the air certain days and times. The youth indicated that they listen to the radio station primarily for the Mexican music that the station plays, but their knowledge of events related to Mexico and the U.S.

Latino/a community suggests that they are exposed to news media with a Latino/a focus, whether television or radio. The turn to popular cultural texts that represent a world larger than their local community space could have an important impact on how these youth will take up science texts that are tuned to that particular local space.

We have also observed youth consulting, but not reading in detail, print news media. For example, Pilar and Alycia stopped to pick up copies of *Latino*, a local community newspaper, on two different occasions so that they could obtain information about a visiting musical group's concert dates and ticket costs. After locating the information they desired, the girls paged through the newspaper, commenting back and forth on different events and notes of interest. Each also saved a centerfold of a different Mexican musical group scheduled to perform in the area at a later date. The paper thus served as a text for obtaining information and for engaging in interactions about both popular culture and community affairs and events. What's worth noting here is that the local paper, although geared to their particular community and to the larger city space, represented transnational and global events and perspectives that related to their local space. Again, the use of popular cultural media texts supports their identity development as members of the Latino/a community, both in Detroit and in the larger world. Our curriculum development team, in an attempt to build a bridge to third space, however, has adapted the science curricula to the local space, without explicit attention to how that space connects to a larger Latino/a community and how that community might be brought into the science classroom.

We also noted that although content literacy strategies often have been suggested as ways to help youth access information from texts, these young women appeared to have little difficulty extracting the information they needed from texts that they cared about. This suggests that the strategies may need to be refocused to better help youth employ the skills and strategies they already possess, rather than assuming that youth need help learning skills such as setting a purpose, skimming or scanning, and note-taking. Of course, these data and previously presented data on Internet text searches beg the question of the role of a reader's engagement with texts as part of the mobilization of comprehension strategies. As a number of scholars have argued over the last two decades (Baker, 1999; Baker, Afflerbach, & Reinking, 1996; Guthrie et al., 1996; Paris, Lipson, & Wixson, 1983), engagement, interest, and motivation are

critical aspects of strategic reading in and out of school. These young women appeared to be engaged with the texts they were searching, and their conversation around the texts indicated that they saw a clear purpose for reading them. Such factors need to be accounted for when thinking about how to encourage youth to draw upon everyday literacy skills to engage in, negotiate, and challenge scientific Discourses and knowledges represented in classroom texts.

Television and movies

The participants in the present study frequently refer to television shows other than news shows. On Univision, for example, *novelas* are popular. In one interview, Viviana provided one of the researchers with detailed accounts of four different *novelas*. Ramiro described his career goal to be an engineer in relation to a popular movie: "I want to be like a electrical engineer or like the guy in *The Fast and the Furious* [a movie about cars; Cohen, 2001], like how that guy did the cars with and everything. I want to like do the design of the computers or cars or something...." In an informal interview, Yolanda, another young female participant in the study, shared jokes that she had recorded in Spanish in her notebook from a show called *Bienvenidos* on Univision (punctuation, spelling, and grammar intact):

> El hombre no tenia nada que ponerse para el baile de disfraces. Y le sujiere su esposa que se vaila desnudo y que le diga a todos que va de naturaleza. (The man didn't have anything to put on for the costume dance. And his wife suggested to him that he dance naked and that he tell everyone that he's going the natural way.)

> En la noche de bodas le dise el esposo a su desilucionada mujersita, 'pero mi amor you pense que te gustaban las cosas pequeñas de la naturalesa.' (On the wedding night, the husband says to his disillusioned little woman, 'But, my love, I thought you liked the little things of nature.')

Yolanda's recording of these jokes demonstrates how television media shape literate and social practices. These young women use their written records of different television shows (and music) that they watch or listen to alone as prompts for oral engagements they have with one another in school or on the telephone (cf. Nespor, 1997).

Of all the popular cultural categories, the categories of news media, television, and movies relate most obviously to science. Students, for example, name movies such as *The Insider* (Mann, 1999) and *Erin Brockovich* (Soderbergh, 2000) when they discuss issues related to air and water quality. In enacting a mock talk show on air quality (led by the team leader), students drew upon popular cultural funds available in television shows such as *Jerry Springer*, *Dateline*, and *20/20*. They also drew on news media during the talk show enactment, and they focused particularly on Fox News, perhaps because it presents a segment called "Problem Solvers," in which reporters seek out and help to solve community problems. They enacted the Discourses of the different television shows by planting industrial spies and undercover news reporters in their groups. To bolster their arguments, they showed mock artifacts of pollution such as smokestack filters (paper towels wiped across the classroom window ledges) and photographs (drawings they had made) taken with "secret cameras." In one recent class discussion, one student, Victor, noted that the topic in an article they had been asked to read, about the growing of square watermelons, had been a topic of an episode of *The Simpsons*. He reported, however, that the watermelons on *The Simpsons* had exploded, and he wondered, apparently in jest, whether the watermelons would "pop back round" if they were removed from their growing containers. "That's what happened on *The Simpsons*," he claimed.

What we find compelling about this category is that popular culture served as an important fund for the youths' school learning—a point not typically acknowledged in the work on funds of knowledge, usually done with younger children who may not be as attuned to popular cultural texts, or in work on youth and popular culture. In fact, some theorists position such texts as distractions (Cottle, 2001). In contrast, we argue that the popular cultural texts of these youth allowed them to engage with other youth, thus supporting peer funds (cf. Nespor, 1997). The texts also helped these youth see themselves as members of both a local Latino/a community and a broader, global Latino/a community. Finally, these texts mediated science and scientific literacy learning. Victor, for example, did not necessarily believe that square watermelons would "pop back round," but he invoked the episode as a referent for the classroom-written text on the concept. The popular cultural text, then, seemed to serve as a visual mediator for the print text. *The Simpsons* episode also seemed to give the print text some credibility or worth in the sense that a story is deemed noteworthy enough to be included in a popular cultural text. In other words, the value of the phenomenon (growing square watermelons) is not only scientific, it is valued in another Discourse community by virtue of its worthiness to be mocked in a cartoonish representation.

In fact, *The Simpsons* episode itself might even be seen as a third space in which the creators destabilize or at least question the value of a scientific experiment to grow square fruit. The representation of this bit of information in two such different texts (one popular and one academic) could be a useful way to construct a third space in a classroom. Asking youth to contribute representations of conventional science in various forms of popular culture and exploring how those representations are accurate or problematic, how they raise questions about the role of science in people's lives, and how they represent science as authority, solution, or problem could be particularly compelling in attempts to build third space. The dominance of popular cultural texts in our data set alone suggests that building third spaces via popular cultural funds may be beneficial. In fact, the importance of popular culture in students' everyday and school lives is underscored by our observations that the youth brought popular cultural funds of knowledge and texts such as movies, television newscasts, and talk shows to bear on concepts in the curriculum at least as much as they brought their own experiences with actual phenomena to bear on the concepts. In other words, rather than bring evidence from activities with phenomena in which they had participated, they often used vicarious representations drawn from popular culture to frame their understandings of science concepts.

Patterns and conclusions across the data: Implications for constructing third space

After coding within each of these categories, we analyzed across categories for patterns in the nature and use of the funds. We looked, particularly, for ways that these funds crossed into school funds or were mobilized by teachers and students in classrooms. We saw patterns in (a) the connections youth made between their everyday funds and classroom science learning, (b) the ways youth used multiple funds of everyday knowledge and Discourse, and (c) the impact of urbanization and globalization on youths' funds. These patterns in the findings suggest some important directions for curriculum development and content literacy theory at the same time that they reveal the difficulty in generating a space in which everyday and school knowledges and Discourses inform one another.

Youths' connections between everyday and school knowledges and Discourses

Although the theories that drive our research push us to resist binary representations such as everyday versus schooled knowledges and Discourses, we are compelled to note that the youth in this study rarely volunteered everyday (or out-of-school) knowledges in the classrooms we observed. In fact, as we engaged in in-depth interviews with the young people in this study, we were surprised to learn some of the information and experiences they shared with us—experiences that we believed had a direct bearing on the science they were learning, but that we had rarely heard them mention in the classroom. When students were explicitly asked to describe experiences, they did so with enthusiasm, but they had to be invited to talk about these experiences. In general, this finding is played out across every category of everyday funds, and, in particular, students in this study generally did not volunteer their knowledges drawn from home and family experiences.

Our analyses suggest that this finding is in part a function of these particular youth, the community, and the curriculum units and teaching we observed in school. Because they lived in multiple geographic spaces, many of the young people in the focus school and community did not often use the physical spaces (rivers, parks, and so on) highlighted in the curriculum, and thus they did not offer their experiences, practices, and knowledges during the science classes that we observed. Few of them, for example, considered the river under study in the water quality curriculum to be their river, as framed in the unit's driving question. Some of them had never seen it. The teachers were focused on connecting the science of the curriculum to the community spaces and so did not actively draw out the various other funds to which youth might have access.

That students did not consider the local spaces highlighted in the curriculum to be central to their lives reminds us that constructing third space in content area literacy is not merely about connecting to local physical spaces, especially for people who are transnational (Guerra, 1998) or whose lives are shaped by global knowledges, Discourses, and texts. An awareness of the many different funds of knowledge and Discourse that shape the texts of young people's lives in an increasingly globalized world, combined with the finding that these youth did not routinely offer publicly their experiences and texts as connected to their science classroom inquiry, suggests that some sort of third space (perhaps an instability of signs and symbols) is always present

(Bhabha, 1994). However, teachers may need to actively develop third space by engaging students in experiments, discussions, and reading and writing activities that focus on, or at least include, the texts and experiences of many different communities, with local space being only one of many that students examine.

Even as we contemplate this conclusion, however, we recognize the challenge that such an observation poses for teachers and curriculum developers in an increasingly diverse world. How do teachers, researchers, and curriculum or text developers develop curricula and texts that draw from and respond to the many different knowledges, Discourses, and texts that young people bring to school? How do we build community action projects that meet the needs of many different local communities, each with their own sets of social issues, language practices, and texts? In other words, how do we construct third spaces when so many different spaces must be represented in the new space that is built? We argue, as did Moll (1992) and Heath (1983), among others, that teachers and curriculum developers must develop deep understandings of the particular funds of knowledge and Discourse that their students have available outside of school.

In addition, given the pattern that among our students few were willing to offer their everyday funds of knowledge explicitly, teachers (and curriculum developers) also need to plan for the active construction of third space. Such active and "planful" construction will depend on teachers' careful listening, as Gutiérrez, Baquedano-López, Alvarez, et al. (1999) illustrated, but it will also require that teachers make clear that many different kinds of knowledges and Discourses are welcome in the classroom space. The inclusion of multiple funds, from classroom textbooks to parents' jobs to episodes of *The Simpsons*, can demonstrate to youth that many different funds are valued and validated in the classroom space. In addition, discussions of texts that reveal the partiality of any knowledges represented in the text and the social construction of Discourses in the text could be useful in building a hybrid, third space. Teachers and students could grapple together with conflicts between what particular science texts suggest (e.g., data from the Environmental Protection Agency's National Ambient Air Quality Standards on air quality) relative to what particular communities experience (e.g., an industry lawsuit). Discussions and written texts can focus on how to bring those knowledges together to reframe experience or to reframe scientific findings.

Skilled and strategic uses of multiple funds of knowledge and Discourse

A second pattern we observed is that the youth we work with already draw upon many different funds, particularly outside of school. Their families, communities, peers, and popular culture all represent sources of knowledge about and ways of knowing the world, and many of these funds have direct connections to scientific literacy learning, as well as to literacy learning in other content areas. Most important, we have noted that youth displayed rhetorical and discursive skills as they navigated different discursive spaces in their everyday lives (cf. Moje & Ciechanowski, 2002). We observed them in multiple contexts, from their homes to their schools to shopping malls and restaurants, and they displayed knowledge of *when* to say, do, or write certain information and they knew *how* to say, do, or write such information. They also demonstrated in interviews that they are aware of audience and purpose, as illustrated by Pilar's discussion of her music collection, by Viviana's explanation of how she explores and hypothesizes about her "archaeological" finds, by one young woman's care in not revealing her musical preferences to other youth, and by all the youths' discussions of how they choose and navigate websites or print texts. They shaped their social, oral, and literate practices to meet those purposes, as demonstrated by the young women writing quotes from songs to use for lunchtime memory games, or even by the overall pattern of the youth refraining from introducing knowledges from home or popular culture into whole-group, content area classroom conversations. Our data show that they did, in fact, bring these funds to bear on their school texts, but they did so in strategic ways. As illustrated by Victor's comment about the square watermelon episode of *The Simpsons*, uttered as an aside to one of the team members, the youth did employ everyday texts drawn from their funds of knowledge and Discourse. Victor, in fact, appeared to mediate his reading of the science magazine with the cartoonish illustration of square watermelons in *The Simpsons*, but that merging of texts was private and not accessible to other students or to the teacher.

It can be said, then, that these youth are active creators of third space, of hybrid Discourse, in their everyday and school practices. In addition, the comparability of skills youth employ out of school with the skills demanded in upper level, content area learning suggests that the distance between everyday and academic Discourse is not as vast or as immutable as one might believe. The distance between

these Discourses can be understood as an epistemological distance—a question of what counts as knowledge to be organized, predicted, tested, expressed, or explained, and of what counts as warrant for validating claims and expressions.

The question then remains why these youth were unwilling to bring everyday knowledges and Discourses to bear on academic texts in explicit or public ways when they were asked to read and write in school. The youth were strategic in their navigations across discourse communities, but they did not make their everyday texts, knowledges, or Discourses part of the official scripts of classrooms (see Gutiérrez, Rymes, & Larson, 1995). Perhaps this is because they subscribe to the binary between academic and everyday, or perhaps because they have not had the opportunity to engage in analyses of how and why different communities develop conventions about knowledges and Discourses.

A number of scholars have written about building third space by incorporating children's everyday language with disciplinary words and phrases (Gutiérrez, Baquedano-López, Tejeda, et al., 1999) or by linking everyday concepts to content concepts (Elmesky, 2001). The pattern we documented of youth engaging in a number of everyday funds suggests to us another possibility for building third space. Science and other content teachers, particularly when focused on developing content area literacy practices, could engage in strategies similar to those suggested by Lee (1993), in which the discursive practices of youth culture are drawn upon to teach similar discursive practices applied to science. Specifically, students' abilities to synthesize, to distinguish among, and to cross-reference information (e.g., names of music artists or CD titles), concepts (e.g., types of cars and engines), and practices (e.g., searching a park for artifacts and hypothesizing their origin) could be called up by teachers when they invite students to engage with scientific information, concepts, and practices. For example, the teachers in our study could draw upon youths' ability to classify and identify songs within musical genres as way of introducing the scientific practice of naming and classifying solids, liquids, and gases. What happens when teachers and students try to enact these specific discursive strategies in secondary content classrooms could be a productive focus of future research.

The impact of urbanization and globalization

Another important pattern we noted is that the youths' funds were shaped by the urban space in which they lived and by the globalizing effects of information, communication, and transportation technologies. As illustrated by our data in the previous section, these youth live transnational lives (see Guerra, 1998). They obtain information about their home countries and states through international news networks, as illustrated by data exemplars from Yolanda and Juan. They write e-mail and regular mail to relatives in other countries and states; they surf the Internet to engage in conversations with youth and adults of other countries or to look at information on peer social networks around the country (e.g., Alexandra's and Pilar's discussion about accessing information on gangs); and they listen to music from countries around the world, as illustrated by Pilar's listing of favorite music groups. Our data also indicate that approximately half of the youth in the sample travel to visit family in other countries on an annual basis. These patterns of globalization and urbanization suggest that youth may be drawing from a broad spectrum of possible funds of knowledge and Discourse. Content area teachers and researchers should continue to study the increasingly diverse city spaces, which include the different parts of the city, different cities to which youth travel, and cities situated in different political, economic, and environmental conditions in which youth live and learn.

Further, youths' increasing access to and interest in information technologies suggests that teachers, curriculum developers, and other youth workers should attend to the virtual spaces that young people may be exploring via the Internet, television, radio, and film (e.g., chat rooms that become texts embedded in particular funds of knowledge and Discourse).

This pattern also requires curriculum developers, teachers, and researchers to carefully consider the specific aspects of information they include in curricular texts. In our own project-based science curriculum development, for example, we have made a conscious effort to include texts on local and particular features of the community as the basis for study. At least some of the youth who use our curricula are more familiar with other areas of the nation and world than with their own local city and community. In short, teachers around the world need to engage youth in reading texts drawn from rapidly expanding and increasingly homogeneous funds of knowledge and Discourse. Youth around the world have access to many different funds, as illustrated by a number of our data

exemplars in which the youth referred to information they had gained about the world from television news programs, the Internet, and their own travel.

At the same time, teachers also need to acknowledge that young people in sprawling urban areas may not have easy access to community-based funds of knowledge that can mediate the funds of knowledge and Discourse offered by information technologies and mass media (cf. Heath, 1994). Although the youth in our study mediated their engagements with peers and popular culture with their family and community funds, the community of a large urban center offers very different kinds of support structures from that of small rural towns (Heath, 1994). We found that some of the youth in our study were somewhat more on their own to make sense of their everyday worlds, and particularly of popular cultural texts, than were other youth. This pattern underscores the value of bringing such texts into content area classrooms for close analysis. Using a popular cultural text such as *The Insider* (Mann, 1999), for example, which these students all had seen or read, could have engaged students in deep analysis of the representations of scientific inquiry and practice made in the film in relation to the science they were studying.

Challenges ahead: Still working toward third space

Our research about the resources available to young people in this community provides important information for those who are interested in trying to build third spaces around content and literacy learning in upper level, content area classrooms. Our team, for example, is developing reading and writing materials and activities to draw from the various knowledges and Discourses of these young people. We are currently constructing curriculum reading materials that include informational texts, case studies of actual environmental action projects that may be based as much in the everyday experiences of particular communities as they are in generalized scientific findings, local and world news articles, and excerpts from the popular cultural texts we have documented youth attending to in homes and peer groups. Many of the news articles reflect scientific issues around the world, and we are developing writing and Internet search strategies for connecting those global issues to local spaces and lives of individuals.

We are building literacy activities that engage students in social action, which are supported by

their activist community so that the scientific knowledges of the disciplines are open to challenge, to critique, and to question. We are engaged in professional development work to construct content area literacy strategies that support youth in working across and within different Discourse communities and their texts. We also are trying to develop interdisciplinary links to language arts and social studies classrooms, in which some of the reading, writing, and social action projects can be developed more fully, drawing from the science learned in the curriculum and incorporating many different community, home, peer, and popular cultural texts. Finally, we are trying to study our own and other teachers' attempts to develop various kinds of third spaces in secondary science and language arts classrooms.

That said, our curriculum development and teaching group has much work ahead in our construction of third space in these classroom settings. First, we need to continue to examine and make evident the different funds that youth draw from as they engage with the texts of different content areas. We need to continue to clarify how these funds mediate youths' reading and writing of all kinds of texts they encounter in school. We also need to experiment with classroom practices that we think merge these many funds with the funds currently valued in many classrooms. A number of researchers have demonstrated that third spaces that build bridges between everyday and academic knowledges and Discourses do support children's literacy and content learning (e.g., Gutiérrez, Baquedano-López, Alvarez, et al., 1999; Gutiérrez, Baquedano-López, Tejeda, et al., 1999; Heath, 1983; Hudicourt-Barnes, 2003; Lee & Fradd, 1998; Moll et al., 1989; Moll & Gonzalez, 1994; Moll & Greenberg, 1990; Warren et al., 2001), but we need studies of bridging, navigating, and change-oriented third spaces constructed in secondary, upper level content area classrooms to document what and how older youth learn in such classrooms. At this point there are few studies of the learning gains that result from the construction of navigational (e.g., Lee, 1993; Moje et al., in press) and challenging (e.g., Barton, 2001; Morrell & Collatos, 2003; Seiler, 2001) third spaces in advanced content literacy learning classrooms. The results of these studies in terms of student learning are promising, but we need more studies in the tradition of Lee's (1993) mixed methods design that demonstrated both the learning gains as measured by pre- and posttests and the teaching practices required to make such a third space possible (see also Moje et al., in press).

Second, school policies need to shift from a focus on learning content information or routine

literacy processes to a recognition that secondary school learning is as much about learning to navigate and negotiate the oral and written texts of multiple Discourse and knowledge communities as it is about learning particular content concepts and processes (cf. New London Group, 1996). Policies and perspectives have to change to recognize the potential value of integrating what youth and their families know with the conventional knowledges and Discourses of upper level content and literacy learning as a means of producing new knowledges. This goal is, perhaps, the most difficult to achieve, because we cannot know what these new understandings look like until we construct them, we cannot study their effectiveness until we enact them, and it is difficult to construct and enact them without a change in policies and perspectives that shape classroom practices.

Finally, if, as Gee (2001) has argued, learning in any context involves and demands identity shifts, then it is important to examine how drawing from multiple funds relates to youths' identity development. As youth engage with texts based in many different funds, their identities potentially become hybrid because they are framed by a complex intersection of many different funds of knowledge and Discourse. If youth enact hybrid, globalized identities that cross multiple Discourse and national communities in their everyday lives, then the implications of content area learning are even more complex than learning the themes or epistemological assumptions of the target Discourse community. And the identities that youth take up in classrooms, through their reading and writing of different texts, have consequences for how their performances in and out of school will be valued.

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