

Polycontextual Construction Zones:
Mapping the Expansion of Schooled Space and Identity

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Abstract

By analyzing the activity of students building a cabin in a school setting, this paper examines how conflicts among schooling and extraschooling activity systems can create an expansive space of identity development and learning. Drawing together activity system theories and theories of social space, the paper illustrates how polycontextual conflicts and expansions are spatially contingent and productive of space. Symbolic and material dimensions of social space provide a sharpened lens through which to conceptualize inter-systemic conflict and development. As the traffic of conflict and negotiation between modal schooling activity and cabin-building is heightened around productions of social space, potential expansion of the systems and persons across them is related to the resolution of spatial dilemmas.

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My research on classroom discourse began with a desire to understand the rich heterogeneity of classroom life, including how participants in interaction construct multiple communities and draw upon multiple resources in interaction (Leander & Brown, 1999). During an extended period of research in one school setting, I began to record how the identities of student participants were associated with the physical space that they occupied in the school building, as members of a technology-oriented "school within a school" (the Kempton Technological Academy, or KTA). I also began to collect data that reflected how the students in the KTA were written and spoken about in ways that indexed their symbolic spatial relations to others. For instance, teachers identified KTA members as "middle level" students who risked "falling in the cracks" in relation to school programs that better served "low level" students and "high rollers." The frequent use of physical and symbolic spaces as a resource for constructing KTA student identity prompted me to reconsider classroom interaction: how do participants in interaction also draw upon and produce symbolic and embodied spaces as they construct identities-in-practice? My recent research follows this line of inquiry (Leander, 2001; Leander, in press-a; Leander, in press-b).

In this article, I extend my work on social space to address relations among multiple contexts of activity. Research in cultural historical activity theory has begun to explore how diverse activity systems are socially and historically coordinated in practice (Engeström, 2001; Engeström, Engeström, & Karkkainen, 1995; Gutiérrez, Baquedano-Lopez, & Tejada, 1999; Prior, 1998; Russell, 1997). My first broad purpose in this article is to articulate the discussion of polycontextuality with an analysis of social space. Secondly, I illustrate how conflicts among contexts may be interpreted as spatially contingent and productive of social space. Third, I illustrate how such conflicts and their negotiation are potentially expansive for student identities and learning.

The construction of a cabin in a school setting is analyzed as an example of polycontextual activity, which laminates schooling and extra-schooling activity systems. The traffic of conflict between modal schooling activity and cabin-building is heightened around productions of space, and polycontextual development of the system and persons within it emanates from resolutions to spatial dilemmas. Prior to this analysis, below I briefly discuss relevant work involving relations of conflict to contexts of learning, learning by expansion, and the analysis of social space or "thirdspace."

Conceptions of Inter-Contextual Conflict for Learning and Identity

Newman, Griffin & Cole (1989) associate the zone of proximal development with the entire functional or activity system in which the child and adult participates, including concrete material situations, various cultural resources, developing representations, tools, and participating individuals with contrasting perspectives. The following analysis is based on this "construction zone" approach to the Zo-ped, but shifts from a mono-contextual to a polycontextual perspective, and considers how activity develops through polycontextual conflict. The primary argument of the article is that polycontextual conflict is an important site for the development of learning contexts (or mesogenesis, Cole, 1995a) and for the concurrent development of individuals. The relationship of conflict to learning contexts has been represented and theorized in a number of different ways within cultural historical activity theory (CHAT) and related work. Among these perspectives, three recurrent and important issues involve the boundedness of schooling as a developmental context for children, the construction of mediational contexts between schooling and extraschooling (e.g., home contexts), and the sustainability of new learning contexts.

We might imagine the ideal school as a kind of optimal environment, in which productive conflicts occur among students and their developing ideas as they engage in experience and dialogue with persons and artifacts. Conflict is managed by the teacher(s); the environment is not simply a reflection of the world, but an improvement upon it. This conception of managed

conflict as a resource for learning is highly Deweyian. Dewey's analysis of an act of thinking begins with some sort of dilemma, or "forked road situation" (1910). Situations within Dewey-inspired schooling that have often been developed by opening up the school to extra-school activity, such as construction or gardening (Mayhew & Edwards, 1965). At the same time, the relative openness of school to society is carefully guarded. School must be somewhat bounded from society in order to "fortify the mind against irrational tendencies current in the social environment" (Dewey, 1910, p. 25) and thus to create an optimal school-based "little community" which might be the "deepest and best guaranty of a larger society which is worthy, lovely, and harmonious" (Dewey, 1899/1943, p. 467).

Another key concern in CHAT has been the mediation of home and school contexts through the creation of new learning contexts, as exemplified in the work of Luis Moll. Moll's work highlights the way in which people participate in various funds of knowledge, and that such funds have an "exchange value" (Engeström, 1987) with other knowledge funds (Moll & Greenberg, 1990). When it comes to schooling, the cultural funds of knowledge that children often draw upon are not valued, and as such they are left with little to offer. As one response, Moll and others set up a "lab"--itself another activity system--to serve as a mediator between the home and schools. The lab attempted to serve as a bridge for children by providing an after-school program that brings together their knowledge funds with school work, and as a bridge for teachers by training in effective means for bridging within the schools (Moll & Greenberg, 1990). As a hybrid, mediational space, the lab moved children toward success in schooling, and is informed by both school and home cultures. The mediation between schooling and extraschooling cultural contexts through the creation of hybrid contexts has strongly suggested the potentials of CHAT for understanding cultural transitions and polycontextual support.

The ability to sustain new learning contexts, as alternatives to traditional schooling, as been another key issue involving the relation of conflict to learning contexts, perhaps most visibly within CHAT in the Fifth Dimension work. An attempt to create a system with its own unique identity, a "system of activities with its own standing rules, artifacts, social roles, and ecological

setting, that is, its own culture" (Cole, 1995b, p. 194), the Fifth Dimension is a game world for children's learning that Cole and others have developed in an extensive research effort across many sites. Nicolopoulou and Cole's (1993) study is an intriguing analysis of cultural "fit" between the Fifth Dimension and two host cultures, a library and a Boy's Club. The focus of the analysis is upon the more or less successful co-existence of the cultures, and how changes to the Fifth Dimension are brought about from its embeddedness (figure/ground relation) within the institutional culture. While we get sense of the margin between the Fifth Dimension and host cultures--the developing boundary lands--conflicts between the developing activity systems are not described as a potential resource for the development of either "guest" or "host" culture. Rather, the notion of cultural best match is maintained as the ideal for the production and survival of new learning contexts.

These important perspectives on context and conflict raise a number of important questions for the development of a polycontextual approach to schooling or other learning contexts. First, what are the limits of imagining schooling as a bounded and purified context? To what degree do or ought teachers have agency to bound conflict among contemporary multicultures? Secondly, as schooling and extraschooling contexts are deliberately mediated, to what extent are such contexts already socially and historically laminated? What hints does this polycontextuality provide for further mediation? Third, while there may be good reason to imagine "seamless nonconflictual learning environments building on the strengths and resources of each" (Heath & McLaughlin, 1994, p. 293), what are the possibilities of conflict among contexts for student learning/identity production? How might issues that threaten sustainability be recast as powerful resources for learning?

Expansion: Inter- and Intra-Activity System Conflict as Resource

Engeström's neo-Marxist work places consumption at the center of a series of interlocking triangles that link exchange, production, and distribution aspects of activity, and through them, the relations between individual persons, tools, goals, rules, community, and the division of labor (1987). A key principle of activity theory developed in Engeström's work is that the inner

contradictions of an activity system can be a key site for analyzing "innovation, change, and development of the system, including its individual participants" (1993, p. 65). Such contradictions, which Engeström, drawing from Bateson (1972), characterizes as "double binds," prompt participants within activity systems to invent new "instruments" for their resolution, through "experimentation, borrowing or 'conquering' already existing artifacts for new uses" (Engeström, 1987, p. 165). The process of identifying double binds, and using "given new" resources to form "created new" instruments, and finally, new activity, is termed "expansion" or "learning by expanding." Engeström's ideas of conflict and development, including the development of new instruments and activity as hybrids, struggling among centripetal and centrifugal forces, resonates well with Bakhtin's sociolinguistics, as he notes (Engeström, 1987, p. 315). For the purposes of this study, his work is most significant as a means of theorizing conflict within and among activity systems as potentially productive of change. Moreover, Engeström theorizes how individual and activity system development are deeply co-constructed (also, Lave & Wenger, 1991).

Moreover, shifting from intra- to inter-activity system relations, or a polycontextual perspective, highlights the co-construction of multiple communities of practice and multiple identities. Within complex work practices, experts are not only engaged in simultaneous tasks, they also "operate in and move between parallel activity contexts," contexts which "demand and afford different, complementary but also conflicting cognitive tools, rules, and patterns of social interaction" (Engeström et al., 1995, p. 320). Studying learning-by-expansion among multiple systems involves tracing the "sideways movement between various activity systems and actors involved" (Engeström, 2001, p. 2). Focusing upon the cognitive dimensions of such horizontal movement among activity systems, Engeström (2001) has recently drawn upon Cussins (1992) theory of embodied cognition, in which the basic metaphor of cognition is that of a person moving in a territory and making "cognitive trails." In the case of multiple activity systems, the space of movement may be termed a "divided terrain," and the horizontal dimension of expansive learning includes boundary-crossing actions (Engeström, 2001, p. 9).¹

In the diagram below (Figure 1), a dashed circle has been sketched around the perimeter of Engeström's interlocking triangles diagram as a reminder that activity systems are multiple. Additionally, as activity systems are historically laminated, the circle also suggests this temporal relation to past systems. Schooling, as an institutional form of activity, is placed at the center of the diagram in order to suggest the expansion of schooling, as a form of practice, through its multiple relations to other activity systems. The multiple rings around the perimeter of schooling are intended to indicate expansion through historical and geographical lamination and conflict with various activity systems.

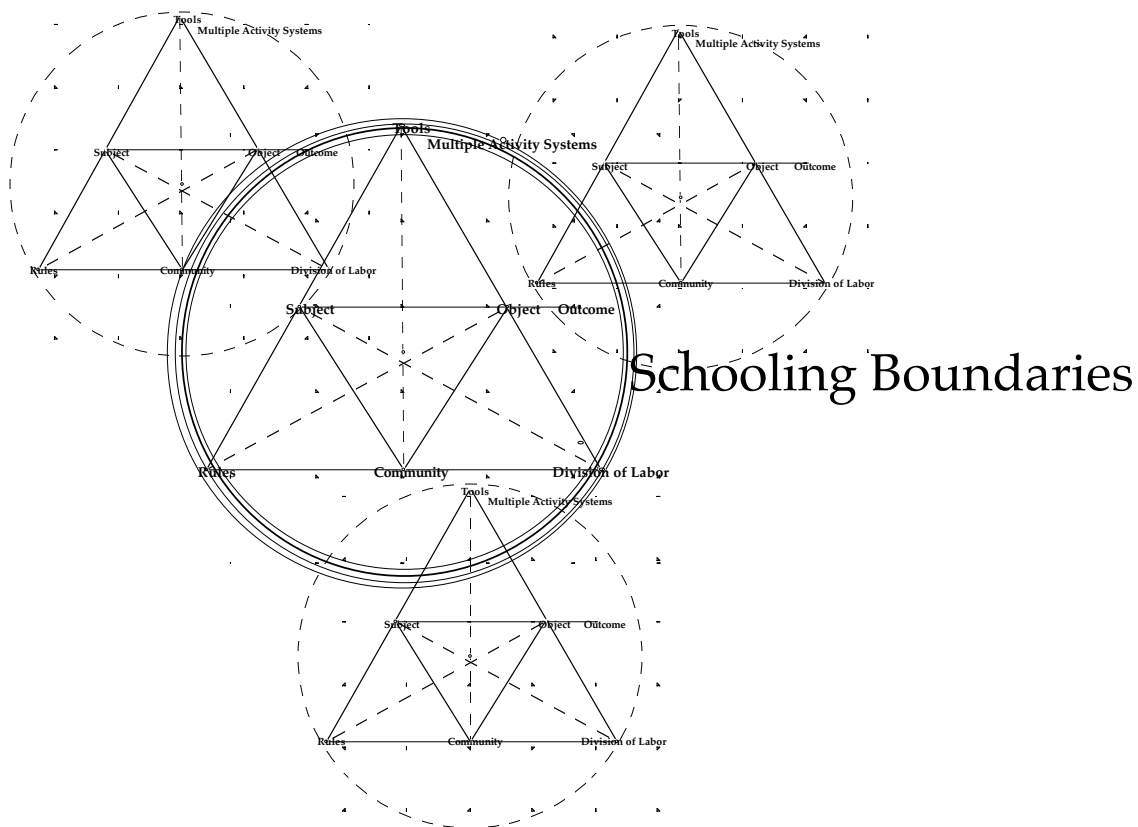


Figure 1. Expansion of schooling through polycontextual relations.

Toward a Spatial Analysis of Polycontextuality

Theoretically, I posit an articulation of CHAT-influenced perspectives on multiple activity systems and developing theories of social space. My purpose is not to develop a close analysis of the boundaries of activity systems via theories of social space, nor to make focused spatial distinctions between intersystemic and intra-systemic development. More modestly, my goal is

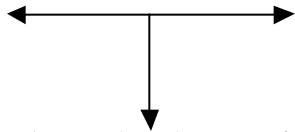
to bring a discussion of social space to the analysis of polycontextuality, to suggest how this discussion might proceed, and to illustrate how this theoretical rapprochement may be productive for the interpretation of individual and systemic expansion. There are important historical reasons for this articulation that could be traced, including, for example, the Marxist threads of both CHAT and geographical theory, as evidenced in the work of David Harvey (1996), Henri Lefebvre (1991), and Edward Soja (1989; 1996). One basic expression of convergence is that social space, like sociocultural context, is considered to be historical, produced within activity, and unable to be analytically separated from activity (e.g., Lefebvre, 1991). Social space is not a static background against which activity develops, but rather space is both produced and productive. Spatial productions, embedded within social practice, constrain and enable productions of identity, including, for example, the construction of racial identity (Haymes, 1995).

A central methodological difficulty in tracing the meanings that social spaces have for people is developing a means to analyze embodied and symbolic productions of social space, as well as their relations (Penuel & Davey, 1999). Lefebvre's treatise on the production of space (1991 #15), and Soja's important extensions of this work (Soja, 1989; Soja, 1996) are largely directed at moving beyond dualisms of objectivism-idealism and subjectivism-idealism in theorizing the production of space. In the analysis of lived experience, as Lefebvre (1991) reminds us, we often fix upon and reify physical, or "perceived" space ("l'espace perçu"). This interpretive myopia in spatial analysis is termed the "illusion of opaqueness" (Lefebvre, 1991) or the "realistic illusion" (Soja, 1989), and is based upon a false assumption that the meaning of space for persons in activity can be read off of embodied practice alone. We are compelled to trace not simply how participants coordinate their activities in physical space and how they move through space, but to also what mental conceptions and symbolic representations they have of space ("l'espace conçu"). To avoid the illusion of opaqueness, or its contrary, the "illusion of transparency" (e.g., space as symbolic construct alone, without material

dimensions), Lefebvre formulates "lived space" as a dynamic, unstable articulation of physical space and perceived space. *L'espace vécu* (lived space) is described by Lefebvre as

space as directly lived through its associated images and symbols, and hence the space of 'inhabitants' and 'users' . . . it overlays physical space, making symbolic use of its objects. (1991, p. 39)

While physical space ("first space") and mental space ("second space") may be apprehended separately, lived space ("thirdspace") emerges as a dialectic of the two.

FIRST SPACE (Perceived Space)	THIRDSPACE (Lived space or social space)	SECOND SPACE (Conceived space)
physical associations between daily routines and material networks involves a level of competence and performance by members	 <p>"trilectical" relation of perceived, conceived, and lived</p> <p>space as "directly lived through its associated images and symbols."</p> <p>space which the imagination seeks to change and appropriate</p>	mental, represented writing, speech, sketch--tends "towards a system of verbal (and therefore intellectually worked out) signs." Dominating space, imposition of order by design

(Lefebvre, 1991, pp. 38-39; also, Soja, 1996, pp. 66-68)

Figure 2. First, second, and thirdspace.

Lefebvre continually posits a third term in relation to two previous terms as a form of "trialectical thinking," in which the third term neither stands alone nor entirely subsumes the other terms (*il y a toujours l'autre*). Soja (1996) posits that thirdspace is not an additive combination or mere synthesis of physical things in space and representations of space, but a "disordering, deconstruction, and tentative reconstitution of their presumed totalization, producing an open alternative that is both similar and strikingly different" (1996, pp. 60-61).

"Fields" of spatiality interact with and influence one another, such that lived space is "simultaneously real and imagined, concrete and abstract, material and metaphorical" (1996, p. 65).

Gutiérrez, Rymes, and Larson (1995) develop the construct of thirdspace in a manner that is related to but distinct from the trilectical relations described above. Drawing upon Bakhtin as well as Goffman's idea of "underlife" in talk, the researchers analyze the teacher's "script" against the students' "counterscript." Both teacher and students, the researchers note, demonstrate a great deal of communicative competence in their own scripts, yet these scripts primarily remain independent. The occasions when these scripts converge are termed a "third space." Through a dialogic pedagogy "in which various cultures, discourses, and knowledges are made available to all classroom participants" (1995, p. 467), Gutiérrez et al. imagine the potential for classroom participants to bridge diverse identities and activities, and thus, rearticulate power relations. This analysis of third space is later extended (Gutiérrez et al., 1999) and articulated with postcolonial work on hybridity and borderlands (e.g., Anzaldúa, 1987; Bhabha, 1994) as well as with Engeström's analysis of activity systems: "the third space might also be considered an expanded activity . . . in which the object of activity is extended and the activity itself is reorganized, resulting in new opportunities for learning" (1999, p. 287).

The present analysis follows from and is inspired by the work of Gutiérrez and colleagues on third spaces as zones of development, (e.g., Gutiérrez et al., 1995; Gutiérrez et al., 1999), spaces characterized by hybridity, competing discourses and positionings, "counterspaces" rich in potential for political and ideological action (Soja, 1996, p. 68). Yet, following a different but related research tradition (e.g., Lefebvre, 1991; Soja, 1996), in the present analysis I extend the metaphorical and symbolic meanings of social (or third) space with material production, stretching the analysis of social space across its multiple resources. Further, approach all social space as "thirdspace;" contrasting thirdspace not to official and unofficial spaces, but to first and second space constructs as described above. Social space is always heterogeneous and conflictual, and more or less charged with potential for the transformation of

learning and identity. The decision to foreground particularly expansive social spaces (akin to "thirdspaces" in Gutiérrez et. al, 1995) is a political choice, a strategy to highlight how the relations among different social spaces destabilizes and reconstitutes the possibilities for learning and identity.²

Contrasting the Social Spaces of Schooling and the Walden Project

Although there are arguably multiple activity systems at play in the cabin-construction project, for simplicity of argument I have primarily analyzed the project as the contact of "schooling" with "extraschooling," which represent, respectively, the relations between typical school activities and associated social spaces with cabin-construction and its associated social spaces. My primary concern is to illustrate development through polycontextual conflict, using schooling and extraschooling as analytic constructs of context. Toward this end, a "modal activity system" of typical schooling is briefly analyzed below. This modal schooling activity was not the focus of research, yet is used as an important subtext of analysis. It is a purified text, setting aside for a moment the assumption that schooling activity systems are regularly laminated with other systems of activity.³

Traditional Schooling as Spatialized Practice

Vocabulary study is selected as a modal schooling activity in part because I have frequently observed such work across grade levels and subjects. Vocabulary study also aligns with others' characterizations of traditional schooling as activity:

In traditional schooling, the object is the school text, displayed in textbooks and in teachers' learning and dictating what are "correct answers." In other words, the authorized text replaces everyday problems and intriguing phenomena of the surrounding world as the object of learning. (Engeström, 1994, p. 16)

The activity system of vocabulary study is an example of "first order learning" (Engeström, 1994) that impoverishes students' instrumental resources (and resourcefulness) and is directed toward institutional testing practices. Its hoped-for outcome is that students

memorize pre-defined native, second language, or disciplinary vocabularies. In many English lessons I have observed within the KTA and elsewhere, vocabulary study involves students using a dictionary and copying the definitions of words printed on a vocabulary handout. Students are often tasked to "make up a sentence" for each new vocabulary word, embedding the word in the sentence so as to demonstrate understanding. The production of vocabulary sentences is often highly problematic for students and teachers, and may serve as only a perfunctory, superficial move toward loosening the activity from its actual goal of definition memorization. Following Engeström's (1987) model of an activity system, several relations that constitute the activity system of vocabulary study suggest how it is stabilized and how various elements are co-constituted. Teacher-directed codes of control, for example, align with school schedules based upon testing (rules), with a decisive gap between student (subjects) and teacher expertise, and with the object of mapping student produced texts (as tests) with institutional texts. It can be argued that vocabulary study helps to produce the classroom as a social space of pre-planned activity, in which student (and even teacher) extemporaneous planning is unusual and often unwelcome. As within any activity system, agency in vocabulary work is distributed, much of this distributed agency is historically sedimented and stabilized. Only minor teacher and student adjustments from subject to subject and class to class are needed in this well-established and well-supported genre of schooling activity. Further, the representation of knowledge on paper (instruments)--the way in which students become represented as paper-based "immutable mobiles" (Latour, 1988)--serves the work of teachers-as-experts to assess individual performances (object). Internal contradictions are also present in the system as well, chiefly the contradiction between outcomes (limited increase in instrumental vocabulary knowledge) and object (testing as a form of text reproduction).

The forms of activity and material mediation indexed within vocabulary study offer some clues to how it produces a social space of typical schooling. In tracing physical or embodied practices, student pathways from door to desk to door suggest how schooling is produced as a constrained space. The negotiation of physical location for activity is often pre-determined;

being "on task" is highly associated with a location in a particular classroom space. Vocabulary study is a tightly ordered space, in which the signs on the page and in the lesson plan (second space) constrain or perhaps collapse onto embodied daily routines (first space). The representation of known word facts on the page and in the dictionary are well aligned with the arrangement of student bodies in rows of desks, embodied positions themselves represented and regulated by seating and testing charts. The material scale of vocabulary study is indexed not only in the classroom, but also at a more micro-level in the activity and artifacts related to the desktop (paper, textbook, pen, and individual person). Student work does not simply occur "on" the individual desktop; rather deskwork contributes to a spatialized meaning of schooled activity and schooled identity. In sum, a brief discussion of vocabulary study is suggestive of some of the ways in which modal school practices create daily embodied routines, which are judged as more or less competent performances (first space), and which are closely associated with the institutional regulation of space through representations (second space). Moreover, as a social space, vocabulary study suggests a constrained (although potentially expansive) spatial imagination concerning the types of objects, identities, and tools likely to be found in classrooms.

The Expansive Social Space of the Walden Project

Working together, four teachers in the KTA--Sid, Maureen, Cindy, and Ellen (teaching History, English, Science and Mathematics, respectively) developed an integrated curriculum for students at the junior (11th grade) level. One unit of this curriculum involved the study of Henry David Thoreau's life and thought. The KTA permits its teachers a degree of day to day determination of their scheduling, and the group's plan was to use this flexible scheduling to develop and carry out the unit. A central activity planned in the unit was the construction of a full-scale replica of Thoreau's cabin at Walden Pond. The cabin would be built in the school's courtyard, which was otherwise little used, containing a few scattered 1960's picnic tables in fading blues and pinks.

It is at the intersection or contact zone (Pratt, 1991) of schooling and extraschooling that the cabin construction project accrued significance; the project and its developing history marked individuals, *a class*, and *the Academy* as distinct from the rest of Kempton High School, or perhaps as distinct from schooling at large. Individuals and groups understand themselves and produce understandings of their activity and social spaces relationally--with respect to other forms of activity and social spaces (Penuel & Davey, 1999). Building a cabin together is a good story, but building a cabin in school with a group of (schooled) others is an exceptional story. The exceptional meaning of the polycontextual activity for individuals was highly evident in interviewing students about the project, where they often related how they would "look back" on the project in the future:

Camilla: This is something we'll be able to tell our kids about--that we were a part of building this--we did this when we were juniors.

The developing history of the project is not only constructed out of current or past events, but also out of imagined visions of a completed project and projected collective identity with it. Students "reached" into the future and connected it to the past in order to construct the meaning of their present activity and identities (Cole, 1996). Even a year after the cabin building was ultimately left unfinished and was later torn down, one student (Trisha) claimed that "the Walden Project was the most important thing [she] ever did in school." This enduring importance of the project, for at least some participants, cannot be readily associated with realizing the cabin as a material goal, and is suggestive of the ways in which the activity imaginatively produced an imaginative social space that contrasted with schooling.

Camilla's comment above also indexes not only how social spaces are understood relationally, but also how new representations of social space and spatialized identity were objectified for both participants and outsiders. The symbolic and material articulation of the cabin construction with the social spaces of schooling produced the project as re-markable, productive of externalizations or "markings" of individual and collective identity (e.g., Holland, Lachicotte Jr., Skinner, & Cain, 1998). For example, on one occasion during construction

activity, a bystanding student from another class shouted to Sid, "How come we never did this when I was in your class?" On another occasion, when a small cabin construction group was in the woodshop, a student taking shop class was working on a knife holder. Displaying the knife-holder, the student asked Jimmy (a student in the Walden Project) what he was working on. Jimmy's pride was evident in his voice when he co-constructed a sense of community, goal significance, and spatial scale in one short phrase: "We're building a house."

Moreover, the the project was not just to build *a cabin*, but *Thoreau's cabin at Walden* . Walden, an imagined historical geography, is also an active context at play, a context in conflict with both schooling and (contemporary) cabin-building practices. The conceived space of Walden significantly shaped the activity. First, Walden gave both curricular and historical meaning to the construction of the cabin. The object of the activity--discovering simplicity and self-reliance--was "projected" from this past space-time to the present, despite the irony of how complex the modern day project eventually became. This object was represented in school-based proposals for the activity, in letters soliciting donations, and in lesson plans. The social spaces of Thoreau's own scavenging and purchasing of inexpensive materials, as represented in his account in *Walden, or Life in the Woods* (Thoreau, 1906) motivated and "designed" the student's own material scavenging practices. These representations of an historical place and time led students to construct new spaces of school-related activity during and after the school day (e.g., family garages, hardware stores, and abandoned lots) that were unsanctioned by the school.

Perhaps most evident in the construction processes, as a represented space Walden supplied the heavy-beamed design for the cabin that produced a number of challenges and conflicts for typical schooled activity as well as for modern construction practices and tools. The design involving large and heavy six-inch timbers was an adaptation of Thoreau's original cabin plans, composed from photos and descriptions of the original cabin as well as from plans borrowed from another school group. Although the design process and the construction processes were heterogeneous and were not in any single sense "authentic" to the original, the project created its

own spatialized story of authenticity, as indexed in the production of a "full scale replica" and in the use of large timbers. No one would actually live in the cabin, it was not near a pond or wildlife, it was built with modern hardware and circular saws, the fireplace would never work, and its permanence was only guaranteed by the school administration for a shifting period of a few months to a few years. Yet, despite its damning inauthenticity as Thoreau's cabin at Walden or as any other single object, the project was deemed highly meaningful for participants. This meaning was not simply produced by replacing schooling "ersatz" activity (Brown, Collins, & Duguid, 1989) with contexts and work deemed to have more social currency. Rather, this meaning appears closely related to the expansion of social space through reconfigured relations to institutional, historical, and imagined social spaces. The manner in which such expansion is evident in space-producing and space-contingent activity is illustrated in the analysis below.

Tracing the Expansion of Identity in Polycontextual or "Polyspatial" Activity

In the following section, in drawing upon two separate episodes of activity, I continue to illustrate how conflicts in the Walden Project may be interpreted through an analysis of multiple and intersecting social spaces. Secondly, through five separate illustrations within these episodes I trace how the negotiation of conflict across social spaces is productive for the expansion of individual and collective identities and learning. As the following analysis focuses upon the production of embodied space, relevant constructs of spatial scale and path are discussed prior to the analysis.

Scale is a key quality when considering the mediation of activity by space. In the case of typical text and test-based schooling, we might note how the activity is mediated not simply by classroom spaces, which confine and order the bodies of students and teachers (Ball, 1990; Nespor, 1997), but is constructed around the individual space of the student's desk or small workspace. Importantly, the tools of vocabulary study (e.g., pencils, texts, paper) are small, portable, and afford (Gibson, 1979) individual use; as such the tools are coordinated with spatial control in the classroom and at the desk. In contrast, the spaces mediating cabin building

include a school courtyard and woodshop, and collective group activity around large-scale objects (e.g., the frame of the cabin) and tools (e.g., a table saw). Cabin-building, as an activity system, has a dramatically alternate mediating spatial scale than does typical schooling activity, a scale co-constituted with contrasting tools, artifacts, and group coordinations.

A related expression of scale is the movement or "path" of persons within activity. This expression of scale represents how activity is experienced as distributed from participants' perspectives within lived experience--the path of their embodied (and symbolic) movements within activity and the access to spaces that this path represents. This construct of spatial path, over time, includes relations of power as expressed in access to spaces, and the resulting parsing or "regionalization" of time-space through routinized social practices (Giddens, 1984). Regionalization is not merely localization in space, as through the material separation of rooms, etc., but is developed through temporal and spatial patterns of use. Thus, for the study of school-related activity systems, following Giddens (who draws heavily upon Hägerstrand's (1975) time-geography), we might map students' locations in space and time, the durations and repetitions of different time-spaces, and the movements between them. Soja (1989) argues time-space paths "are strongly influenced by, and also reproduce, basic institutional parameters of social systems in which they are implicated" (p. 149). Differing time-space paths, thus, are highly suggestive points of conflict among various (institutionally producing) activity systems. For the purposes of this study, I will not map time-space paths per se, but will rather analyze spatial access within different activity systems (schooling and cabin building) and the conflict produced by their contact.

The Woodshop as a Danger Zone of Proximal Development

The woodshop is physically isolated from most classrooms in Kempton High School, including those of the KTA, and in this sense is preserved as a relatively separate context. The woodshop is on the ground floor at the far end of one wing of the building; nearby rooms include the auto shop and a media production room. A band room and small gymnasium are

closer to the subject area classrooms than is the woodshop. The woodshop is also constructed as a separate space through the (embodied) path of students. A small proportion of the students (8%, most of them boys) is involved in woodshop classes at some point; for most of the school population the woodshop (and other vocational-technical programs) remains largely separate from their educational experience.⁴ The school stabilizes, in some sense, the meaning of typical school spaces by isolating the woodshop from the school's day-to-day operation. However, while the woodshop is materially and symbolically isolated from most classrooms and persons, in many ways it is produced as a "well-schooled" space. Although woodshop tools afford either large-scale or small-scale projects, projects are typically small-scale (e.g., knife holders, bookends, or simple woodcuts), in some sense resembling the scale of individual, paper-based work in the classroom. Plans for these projects, complete with thorough drawings and written instructions, are made available to students. The institutional object of completing woodshop projects is largely about following directions and demonstrating competency with tools—performing the role of "woodshop student." Regular instruction and testing on safety attempts to reduce to a minimum the risk involved in using powerful tools, hence "schooling" the space to produce it as more akin to classroom spaces. The ordering and control of embodied space in the woodshop, through symbolic representations of space (first space), bears a strong relation to the control of material space in the classroom.

The woodshop, therefore, is a kind of paradoxical space, socially and materially removed from most students' experience of schooling at yet, quite "schooled" as a produced in practice. The dynamics of separation and (school-related) institutionalization of the space are important background for the following analysis of one cabin-construction group working with a woodshop table saw.

In the following interaction, Sid (a teacher), Karen (Kar), Trisha (Tri), and later Jimmy (Jim) (all students) are in the woodshop, cutting an 8-foot long, 6x6" wood beam for the cabin construction. The group is alone in the woodshop, while other students in this class are working on cabin construction outside in the schoolyard. The group first attempted to cut the beam with

a smaller radial arm saw, but failed to find a way to make the six-inch beam fit beneath its blade. They then moved on a larger saw, which has a blade that rises from beneath the saw table. Although the particular cutting operation they are pursuing is possible with this saw, through its situated use in the woodshop the saw more readily affords smaller projects. The group must learn to adjust the low blade height and understand how to mount and use unattached saw "fences," typically used for larger cuts. The saw indexes how the group's (polycontextual) activity is possible, but not ready-to-hand, and therefore must be negotiated and developed.

As the group works, Sid physically locates himself behind the saw and at times directs the activity. Yet, his expertise about using the saw is evidently little different from that of the students. He displays this lack of expertise in raising questions and expressing doubt or uncertainty, as do the students. Sid draws upon the memory of observing the saw used "just yesterday" by woodshop teachers and students. Karen and Trisha are less enthusiastic than is Sid about attempting to understand the saw as a group. At the beginning of the interaction, Trisha physically distances herself from the saw by at least two feet. Karen recommends that other teachers be contacted, and Trisha suggests that the group might seek out immediate instruction on the use of the saw. However, Sid continues to focus upon the saw as a potential tool, and proceeds with a process of inquiry about the saw, moving and adjusting pieces as he raises questions, making use of his ignorance as a resource to engage the girls in a process of co-discovery.

The saw is an opaque but potential tool for the group. Their goal of cutting the wood develops a sub-goal of learning how to operate the saw; the "tool" is presently a developing plan, which is represented by the group as a series of "strategic fictions" (Newman et al., 1989). The group is not only constructing the saw conceptually, they are simultaneously constructing it materially, reflecting the material-ideational nature of tools themselves (Cole, 1996). The group interaction largely revolves around a guide apparatus that Sid observed others adjust in the woodshop the previous day. The group discusses whether or not this guide moves and how it might be repositioned. Trisha questions twice whether the guide is needed at all, and then soon

afterwards constructs a use for it ("maybe it keeps your wood straight"). As planning moves closer to actually using the saw as a tool, the students' concerns about safety dominate their discourse:

53. Sid: What do you wanna do?⁵
54. Kar: Watch your fingers
55. Sid: Are we straight? (.) ((Looking to left, toward end of wood piece. K is holding piece at this end.))
56. Kar: °Yeah°
57. Sid: Are we perpendicular to the saw?
58. Kar: I think, I dunno, it's kinda crooked. ((T is standing near S in front of saw, leans back and looks at placement of wood piece)).
59. Sid: All right, so both of us kind of have to guide it through. ((S standing to right of saw blade, holding onto 4x4 briefly and walking away. K is holding onto left side of 4x4)).
60. Tri: You also might want one of those things over here to push through with= ((Pointing to fence piece located by S.))
61. Sid: Good idea. ((S picks up fence and swings it over blade to left side. Places flat part of fence up against 4x4)). Here?
62. Kar: Just watch your saw (. .)
63. Tri: Or you could take this, and like put it, ((T motioning with hands that guide could be placed on right side in similar fashion to fence on left side)) or maybe actually no, cause it would (go through the saw)
64. Sid: That would be a terrible sound
65. Tri: What's this () ((walking out of view, away from table)). (. .)
66. Sid: All right, let's see if it works. How do you turn it on? ((S looking across top of saw table)).
67. Kar: There's an on-off button over there. ((K points toward underneath saw table top)).
68. Tri: This is dangerous (. .) ((walking back toward table in view of camera, on right side, approx. 2 ft. from table, hanging head to side and down)).
69. Sid: Isn't it? It is °dangerous°. I like it. Here we go. (. .) ((S places goggles on)).
70. Tri: Goggles on. ((puts goggles on, and plugs her ears)).
71. Kar: This is kind of scary. Do we pull the board off the blade when [we start?
72. Sid: [Good idea. ((S backs up board slightly, starts saw motor. When motor is started, S pushes right arm through sleeve in exaggerated, flowing motion. Pierces lips. Places hands on top of wood on both sides of blade, and pushes through blade slowly, cutting part way through wood. K is holding onto longer left side of 4x4. Stops blade while still in cut.))

The students' and teacher's reciprocal appropriation as they use the saw indexes how their work destabilizes fixed student/teacher identities. Student and teacher identities are renegotiated in relation to tools and tasks that are unfamiliar to them and held separate from their experiences within the social spaces of everyday schooling. These negotiations are highlighted around joint planning, indexed, for example, around Sid's uptake of Karen's assessment that the board is

crooked ("All right, so both of us kind of have to guide it through," 60), Sid's uptake of Trisha's idea of using the fence piece to push the board (61), and Karen's instruction to Sid concerning starting the saw (67).

Identity destabilization across schooling and extraschooling contexts is also evident in the threesome's joint construction of risk. Issues of risk are significant within the interaction as a means of destabilizing teacher/student identity; assumptions about teacher protection, borrowed from the classroom space, are disrupted in this polycontextual zone of schooling/beam sawing. Constructions of fear and risk within the discourse are significant, as the affective and goal-directed dimensions of the activity are tightly interwoven in the production of polycontextual learning spaces. Throughout, the possible risk of bodily harm offers a heightened sense of the importance of the planning activity, giving a purpose, focus and energy to the interchange that is difficult to capture in a transcript, yet suggested in the flurry of last-minute warnings and advice-giving.

Trisha and Karen both give safety warnings and suggestions to Sid for using the saw, including watching his fingers (54), using and not using the guide to push the wood through (63), and pulling the board back before starting the motor (71). Trisha's "Goggles on," (70) following her observation of Sid placing his on (69), suggests ensuing danger, the type of line one might hear reported back to Mission Control in a drama or adventure film. While the students directly and indirectly express their fears, Sid's affirmation of Trisha's worries, "It is °dangerous°. I like it. Here we go" (69) functions interactionally to change the meaning of "danger," through irony, as something to be pursued rather than avoided. Sid's use of irony contributes to the uncertain border-play of his identity in relation to those of the students: Is he unaware or careless of the danger, and thus not acting as a teacher should? Or, does he know more than he is letting on, feigning ignorance about the situation to engage the students, as he is prone to do in the classroom?

Sid's Mediation of Institutional Rule with Self.

Sid has gained temporary institutional approval to use the woodshop and tools with the students for building the cabin. However, officially, without passing a woodshop exam safety exam, the students are not allowed to use the tools. The examining process itself is tied to course instruction, which does not guarantee that students will have taken the exam (as in Jimmy's case) but is intended to prepare them for it. To mediate this gap between the need to use the tools for cabin building and lack of official sanctioning, Sid serves as an embodied guarantee of the students' safety, having gained permission from the administration that the students would work under his guidance. Although he is not trained himself, as an adult and teacher he bridges between the students and the institution, the classroom space and the woodshop space. Sid serves as an embodied, stand-in "rule", expanding the boundary of work in which the students can participate.

Sid's embodied and symbolic positioning among the classroom and woodshop spaces also expands his teacher identity beyond expected norms in the classroom. While a teacher's position in modal schooling activity might be understood as carrying out school policies and rules, including control of students with respect to particular spaces, Sid shifts beyond this institutional position⁶. Sid's embodied and symbolic position is reflected in many other ways within the project as well: Sid and Maureen permit the students to access to spaces, tools, materials and schedules that are often either borderline or clear violations of school rules and policies. Sid and Maureen consider their work within the cabin-building project to be somewhat positioned against traditional schooling and an attempt to change it. Yet, the teachers do not throw school rules and policy to the wind; rather, as in the sawing example, they bend or blur the lines to fit the needs of the group's work. Moreover, the activity system of cabin-building creates conflict with the institution--a gray borderland of fuzzy contexts in which the project evolves, expanding social space beyond Sid and Maureen's personal resistance to schooling (and quite possibly extending that resistance).

Jimmy's Funds of Knowledge and Re-positioning across Polycontexts

After the group initially cuts the board, Jimmy enters the shop in search of a tool. Unlike the other students, Jimmy has previously taken a woodshop class. The group members know this, and ask Jimmy for help in using the saw. First, Jimmy remarks that he has not taken "the test" yet, so is not qualified to use the tools alone. Immediately following, however, Jimmy demonstrates how to attach the fence to the saw table, and how to loosen the table and make it slide, keeping the board and fence both stationary on the table top. The group questions Jimmy as he works, but he speaks little, and Sid assists him in ways that are similar to how the students have assisted Sid previously. The group is highly focused on Jimmy's work, and Karen's remark "This is cool!" seems a good summary of the group's appreciation of Jimmy's skill and for his assistance.

Jimmy's was not typically successful academically, struggling especially with school-related literacies. However, Jimmy attended school every day (was once given an award for attendance) and thus by regular participation was at least marginally successful in schooling. Outside of school, Jimmy had a number of experiences working on building and mechanical projects with his father and uncle. This knowledge was not typically relevant in schooling, but was made relevant through the cabin-building project, in which Jimmy moved from the (academic) margin of the group to a role of routine quiet leadership, resourcefulness, and expertise. Jimmy's assistance to the teacher and the others use the saw is a telling illustration of the boundary location of the project and its mediation of Jimmy's involvement in school-based activity. This mediation by the sawing activity puts to use Jimmy's funds of knowledge (Moll, Tapia, & Whitmore, 1993; Velez-Ibanez, 1988) valued outside of school within the school context.

Yet, it is important to emphasize that Jimmy's relation to school is a particular production of social space in activity. The sawing activity, for instance, positions Jimmy much differently than does his work in woodshop class. Within the woodshop class, Jimmy was not certified to use the table saw on his own, not having passed a written and practical test. The written test was likely one of many tests that Jimmy either did not take or did not do well on. In woodshop

class, Jimmy's extraschooling funds of knowledge likely assisted him, but did not appear to position him much more successfully with respect to schooling. As noted earlier, in practice the woodshop is in many ways a highly "schooled" space; woodshop activity does not neatly map onto home-based funds of knowledges and objects of labor. Yet, as the cabin-building project laminated classroom, woodshop, and extraschooling contexts, creating alternate paths into the woodshop and temporary rules that destabilized diversely situated knowledges, Jimmy began to construct a position of expertise and confidence. Across the polycontexts of the project, Jimmy's home-based knowledge funds as well as his (uncertified) woodshop expertise become meaningful and valuable.

The developmental potential of this lamination of spaces is also evident in the manner in which Jimmy begins to strategically use school-related knowledge for his engagement across the social spaces of cabin-building. For example, on one occasion Jimmy organized a trip to collect salvaged building materials from another student's home. Jimmy posted a sign-up sheet for the trip on the classroom door, relating how he had borrowed a truck, and asking for volunteers to help pick up materials for one of two dates. Jimmy's description of the plan and sign-up sheet revealed some of his struggle as a writer. However, his experience and interest in building, along with his access to a pick-up truck as a home-based resource, supported his both his leadership within the cabin construction project and his development of literacy for public purposes. In five months of observing the class, this was the only occasion in which I recorded that Jimmy used his written literacy skills voluntarily and publicly to address the entire class. It is a significant instance of the multi-directional work of the cabin-building activity across schooling and extraschooling contexts for the expansion of identity.

Trisha's Negotiation Among Multiple Social Spaces

When Sid, after appropriating Jimmy's guidance, is about to cut the board again, he pauses, steps back as if changing his mind about making the cut himself, and draws Trisha into the center of the activity:

103. Sid: This--is better. (. .) Someone else do it--it's easy. ((S steps back, abruptly, from saw table, and looks toward T and then K.))
104. Tri: I don't want to do it. ((S looks back at T, and coaxes her to come to table, with circling index finger in motion between her and table)).
105. Sid: It's got a cool sound. (. .) ((T approaches front of saw table, and S moves behind her to right)).
106. Tri: O.k., so what do I do? ((Places hands up toward saw, palms out, then drops them in front of her. Lifts hands to perimeter of goggles as if to shade from light)).
107. Sid: I'd say right hand here, ((places right hand on fence handle)) left hand, hold it together? ((Sid grasps beam and fence with left hand)). Karen will guide, we'll guide=
108. Tri: And then I just push? That's all I do? ((T places hands as indicated by S, crouches a bit lower.))
109. Sid: Yeah. Just give it a push to see how easy it is. (. .) ((T moves table-fence-wood assembly toward blade))
110. Tri: Let's see, start ((S points toward switch))

Trisha's bodily position with respect to the saw throughout the interaction has suggested her fear and a distancing from it much more so than Karen, who handles parts of the saw, turns the blade adjusting knob, and holds the wood while Sid cuts. Sid seems to respond to Trisha's comment "I don't want to do it" (104) as an indication of who ought to do it, coaxing her on and allaying the tension of the moment with "It's got a cool sound" (105). Although Sid's "saw expertise" is little different from Trisha's, he helps construct a Zo-ped for Trisha by coaxing her from the periphery to the center of activity (104), allaying her fears (105), demonstrating hand placement (107), and then encouraging her to take a simulation push (109).

A brief extension of the episode above nicely illustrates how the relations between schooling and extraschooling contexts within the project were highly unstable, and how individual or collective development are indexed in momentary negotiations of social space and identity. The project did not have a single history and geography for participants, but rather multiple interactional histories and geographies that produced differently configured developmental opportunities. Consider the following exchange, which followed the sawing episode analyzed

above by one week. Here, Cindy (a teacher) interacts with Trisha and Missy (another student) while they are working on the cabin in the schoolyard.

- Cin: We need to have these boards cut.
 Tri: I know how to use the saw.
 Cin: No, you have to have an adult cut it.
 Mis: Mr. Bartoli let Tyrone do it.
 Cin: I don't want to hear that.
 Mis: Mr. Bartoli said as long as there is an adult.
 Cin: As long as you have passed that test for the shop.

Rule bending, as described in the sawing episode, often conflicted with the views of the other members of the teaching team involved in the project. In working under Cindy's supervision, Trisha's "knowledge" of using the saw is uncertified institutionally, knowledge is suggested to be not embodied "know-how," but symbolic access to a social space. Cindy "doesn't want to hear" that Sid allowed Tyrone or other students to use the saw, an interesting choice of words suggesting how the students and teachers together are constructing a controlled and contested narrative of their work, including representations of their activity and associated social spaces. Cindy also senses her own identity as a professional being compromised through her association with non-sanctioned activity; resisting such an expansion of identity she foregrounds institutional rules and disallows particular stories to be related and enacted.

One way of interpreting this brief exchange is that it indexes the limitations of the project through the closure of institutional regulations, how monocontextual schooling closes down possibilities of expansion. Trisha's earlier learning about the saw is not useful to her at this moment, not extended into this micro-context. On the other hand, Trisha's assertion of "I know how to use the saw" is striking, given that just a week previously she was urging the sawing group to seek outside expertise, and given that Trisha had a high investment in traditional forms of success as a student. Trisha's articulation of ability, in relation to an institutional authority (Cindy), is suggestive of how she is developing an alternate positioning in relation to schooling/extraschooling, beginning to identify herself more completely with the polycontextual boundary-work of the project. Perhaps the most powerful form of identity production in this illustration is essentially Trisha's negotiation of her position, as is evidenced in her careful

assertion of ability followed by withdrawal. Trisha does not push her own history of using the saw with Sid; rather, she chooses for argument the case of Tyrone, seeming to distance herself from critique as she tests Cindy's position. Trisha needs to interpret the particular configurations of context that are actively produced by Cindy at this moment, negotiating the boundaries of her work and identity. The brief exchange suggests not only Trisha's ability to build upon an identity affirmed through past (polycontextual) experience, but also her developing ability to negotiate identity and activity as multiple contexts are reconfigured.

Keeping the Girt Moving: Constructing New Paths and Collective Activity

The discursive and material dimensions of schooling and extraschooling social spaces are central to interpreting the object of moving a "girt," a sixteen-foot long piece of the cabin frame, as analyzed in the following. The frame is made primarily of heavy timbers (6 x 6 inches), which is itself a polycontextual production in design, discussed above. Moving the girt requires several people, thus the spatial scale of this activity permits us the opportunity to consider how a polycontextual conflict affords an opportunity for collective identity negotiation and development. The manner in which this particular polycontextual activity may be understood as relating to the articulation of social spaces is most evident by analyzing how the object of the activity is developed as a response to contrasting and even competing social spaces, and further, how new spatial paths for the girt are developed as a response. In brief, the collective activity of moving the girt represents a temporary solution to positioning and repositioning the Walden Project across schooling and extraschooling contexts.

Rather than actually building the girt in the school courtyard, the group must move it outside of the courtyard in order to prevent disturbing other classrooms with the noises of hammering, sawing, and talking. Noise control is one means that activity, the institution, and space are co-articulated. While schooling activity may be imagined as shaped by the spatial constraints of classroom walls, equally significant as a production of social space is that school walls dynamically connect classrooms to one another, controlling and normalizing zones of

activity. Vocabulary study or other seatwork is reasonable not simply because it occurs in a classroom and at a desk, but because it occurs next to multiple other classrooms. In this sense, classroom walls are as much an opening to neighboring activity as they are an enclosure. In some schools, the enforced presence of open classroom doors is material evidence of this symbolic opening between rooms and the institutional control through spatial proximity.

Yet, while girt-construction must move beyond the school courtyard, the project cannot occur on non-institutional space--students need to be accounted for *qua students*. Hence, the students and teachers work in the schoolyard, just beyond the courtyard.⁷ Finally, and to complete one cycle, while the school yard is an adequate space for noisy construction work, permanently locating the project there might, first, make too ambiguous the relationship of the project to classroom, and secondly, would expose the developing cabin to vandalism. Consequently, after each work session, students must move the girts and other construction materials into the locked courtyard (a safe school space) for storage. Continual movements between spaces, movements that represent the project's struggle to become stabilized either within or beyond the school, characterize the polycontextual construction of the cabin.⁸ Motivated by spatial conflict, this movement produces a need for a type of collective activity that would not be present in either cabin-construction or modal schooling activity. Moreover, as the following data suggests, this alternate path not only pushes schooling "outward," it also contributes to a path "inward" for certain students positioned outside of schooling.

In the following transcript, ten students and two teachers are coordinating their actions to move the girt out of the school courtyard, where it has been stored, and out onto the school lawn, where it can be worked on. As suggested by the vocabulary study example, the scale of schooling gathers around the desk, the writing utensil, the page, and the individual. Even activities structured as collaborative often gather around tools and artifacts that readily afford individual interaction, suggesting one of many reasons why school collaboration is prone to becoming parallel individual work. Moving the heavy girt, however, requires that eight to twelve individuals coordinate their communication and physical activity. The labor is distributed across

the group not due to the external purpose of learning collaboration itself, as is common in schooling, but from the practical matter of the task requiring many bodies.

Yet, because the labor contrasts sharply to schooling, the students and teachers are not equipped to unproblematically engage in such scaled up collective activity from their past practices. The activity conflicts with their individual and collective histories of what it means to "work together" in school. As a group they must develop a new means of communicating and moving with and through the material mediation of the heavy timber girt. A new form of activity--an on-the-fly planning, negotiating, pushing, shouting, suggesting--develops in their attempts to laminate schooling and extraschooling spatial scales. Additionally, stories of struggles and successes with past collective activity contribute to the scaled-up possibilities of ongoing activity in the polycontextual construction zone.

"Mau" (Maureen) and "Cin" (Cindy) are the teachers; "Kev" (Kevin) is the researcher and author; and other names are abbreviated student names as follows: "Tyr" (Tyrone), "Tri" (Trish), "Les" (Leslie), "Mic" (Michelle), "Dam" (Damian), "Jim" (Jimmy), "Jil" (Jill), and "Ben" (Ben).

1. Mau: Let's move this big girt out there you guys. ((Bending down while speaking, moving two 2x4's off of girt and to the side.))
2. Tyr: Just us? We can't do that. We can't move that big thing. ((Seated at picnic table nearby)).
3. Mau: Why [not?
4. Tyr: [It's too [big
5. Mau: [we've done it a few times
6. X: Yes we have.
7. Cin: I think you can manage. ((Approaches Tyrone, pats his bicep with both hands, above and below)).
8. Tyr: No, it's too big, we gotta wait till some more people come
9. Mau: No:pe, we can do it
10. Tri: Wait, we need to move all that stuff though, cause (. .) we need to wait for Jimmy to get done with whatever he's doing
11. Les: (.) He's leveling the ground. ((moving more 2x4's off of girt)).
12. Tri: ((to Maureen)) () the foundation would be like where it would go, and that was the only reason we were gonna do it, to see if the foundation ()
13. Mau: Yeah, what I'm saying is today we're gonna put, we're gonna put these pieces in? ((walks over to girt, indicates uprights that are missing in the top girt, unlike the one below it that has uprights installed are nearly exactly on top of each other, making top missing uprights evident)).
14. Tri: Yeah
15. Mau: and we need to do that out there ((points beyond courtyard to area outside))

16. Mis: oh wait, I understand ((gets up from seated position at picnic table, moves over to girt)).
17. Mau: so we need to move this out [there so we can work out there
18. Mic: [so we gotta move it out there
19. Tyr: How 'bout I hold the camera, and you hold my end of the thing? ((pointing toward the girt))
20. Kev: Heh-ha-ha, oh, I think [you're, I think you've got enough brawn, you've got enough brawn, Tyrone
21. Tri: [Tyrone, come on you're () ((Moves over to Tyrone, who is now standing off near table)) you're being a baby, come on! ((Pulls on Tyrone' arm, pulling in direction of girt)).
22. Tyr: I can't do it--I'm allergic to manual labor, I can't do it ((Initially pulling in other direction, but then walks over to girt, momentarily holding Trisha's hand)).
23. Mau: O.k., um, Jimmy and Ben I'm gonna need you guys to help us pick this up ((Bending down, and beginning to lift it up while making request. Michelle, Janet and others helping. Lifting from top. Tyrone and Damian are not yet helping)).
24. Tri: Strong guys need to go at the ends so that ((Standing at middle bottom position of girt. Indicates ends of girt with both hands. Entire group of 10 people has now gathered around periphery of girt)).
25. Dam: Then you have to get on one end? ((Indicating corner of girt to Tri.))
26. Mic: WHAT ARE YOU DOING! ((At other end from Michelle, people are starting to set girt back down)).
27. Cin: ((pointing down)) ()
28. Tri: ((to Damian)) No, I said strong (.) are you calling me (a strong guy)? ((Pointing to self with both hands)) You ()
29. Cin: This is going to flap up ((Demonstrates quick forward motion with arm of something falling forward)).
30. Mau: Oh, I see
31. Les: and it's going to go right on my toes (Putting foot on top of bottom beam)).
32. Tri: Why don't we move it this way a little bit. ((Gesturing toward herself with both hands, at base of girt)). Should we move it this way a little bit? ((Regesturing)).
33. Cin: (.) Can't we just slide it over there? (Points to outside gate)). I don't see what's ()
34. Jim: Yeah. Slide it off, on (over this way)it's not that heavy, everybody watch their toes
35. Jil: Don't they have those little cart things? [They have those little cart thingees.
36. Jim: [Here, everyone, watch your toes.
((Slides girt forward, working from corner)).

Spatially Scaling Collective Identity in Practice

As the students and teacher work together to coordinate their activities across space, time, and materials, they "work together" a newly developing form of labor, collective planning, with possibilities for the re-articulation of collective and individual identities. The transcript highlights the moment-by-moment planning of the group as it negotiates how to complete a task that necessitates their embodied and discursive coordination. For example, various

appropriations of the word "slide" are suggestive of ways in which planning is distributed across the members of the group and is responsive to both their discourse and physical action. After Trisha remarks and motions to move the girt toward her (32), Cindy suggests a plan for the larger effort--sliding (rather than carrying) the girt outside the courtyard (33). Jimmy responds to Trisha's plan of "move it this way a little bit" (32) by using Cindy's term "slide" and Trisha's words "this way," accompanied by an action that "slides" the girt "a little bit." Further, the discussion of obtaining a cart from the auto shop, initiated by Jill (35), appears to build upon Cindy's use of "slide."

Yet, beyond spoken discourse the transcript also indexes how planning is distributed among material artifacts. Particularly noteworthy is how the spatial scale of artifacts (here, the girt) works toward the development of complex collective activity. The weight of the girt itself (estimated at 400 lbs.) affords plans of sliding over lifting, and produces a type of exigency of action at moments, rather than protracted planning of next moves. As the group is moving the girt to an upright position, on one end they begin to lay it back down again, at which point Michelle demands to know what the workers at the other end are doing (26). Cindy points downward to motion the next move; she also speaks but her voice is inaudible from the opposite end of the girt. Cindy has decided that the girt is going to "flap up" (29) as it is resting on another girt laying on the ground below it, and Maureen, who is working on Michelle's end, confirms her understanding. In this interaction, physical movement precedes communication about the meaning of the movement. This movement is communicated through the sixteen feet beams of the girt itself; Michelle and Maureen and others working at one end of the girt are given a material/physical message that counters their present activity, then a gestured message, and finally a spoken description. Actions both respond to plans and communicate plans, such that planning activity, and the reciprocal appropriation of the activity, is experienced in material-discursive form.

Externalizing Collective Identity and Expanding Tyrone's Paths to Participation

Maureen issues the directive to move the girt while she is already preparing to do so (1), as such the next move in the activity is defined in her mind and she communicates it to the rest of the group. Tyrone's challenge (2) is not simply a refusal to work, but a statement of disbelief that the group can move "that big thing." The different resources deployed in order to convince Tyrone to become involved include teasing and an appeal to his strength (7, 20); ridicule by a peer (21), and an indirect appeal to his manhood (24). For the present analysis, I am primarily interested in how a collective history, as an alternative collective identity, is produced in Maureen's replies to Tyrone ("We've done it a few times" (5) and "No:pe, we can do it" (9)) as well as in Trisha's script about how to proceed (24). While some initial bantering and appeals to strength are focused upon Tyrone's abilities as an individual, other replies construct a recently articulated history of collective possibility. Such on-the-fly accounts, as with the objectifications of the Walden Project discussed earlier, are potentially expansive for the construction of the collective as an entity, and for representing or re-imagining the possible in collective activity.

The significant relations between producing new accounts of the possible and collective activity as a form of identity-construction is evident also in another interchange during the girt moving between Leslie and Maureen. While observing the others move the girt, Leslie recounts to the teacher the problems the group overcame during yesterday's moving activity:

52. Les: Yeah, cause I had a major problem like yesterday with balancing--then the rest of us ()

56. Les: We had like six people carrying it ((walking behind girt, still in courtyard))

57. Mau: Did you carry it sideways?

58. Les: No, we carried it like that, straight up. We had like five people lifting it.

In this episode, Tyrone sees that the activity is going to go forward and that his resistance as an individual will not change the collective plan, so he offers instead to be a group observer, to replace me, as researcher, and hold the camera (19), stepping out of the path of the activity. Tyrone plays up his continued resistance and "allergy" to manual labor (22), but then, taking Trisha's hand briefly, shifts his stance and walks freely to take a position around the girt,

moments later to become one of the primary workers in the collective movement. Trisha serves the role of mediating between a common group purpose and history with a personal appeal to Tyrone, joining collective and individual identities. Trisha aligns embodied mediation--literally pulling Tyrone into the spatial path of the project--with a spoken plan indexing a successful collective history. Trisha's plan is based primarily upon "strong guys" at each end of the girt (24), a discursive construction of Tyrone's location and involvement. Moreover, both physical and symbolic mediations appear laminated with flirtation between the two (e.g., the brief hand-holding), contributing to the strong personal affect of Trisha's embodied and discursive mediation between Tyrone's self-distancing and eventual engagement.

Yet Tyrone's initial (material-symbolic) distance from the activity can be more richly interpreted by drawing back from the present interaction and considering his broader relations to the spaces of schooling. Briefly, Tyrone was frequently absent from school, and failing several subjects at the time of this study. He was not infrequently involved in authority struggles with teachers, and in staff meetings among the teaching team it was often noted how poorly Tyrone was doing in most classes. On this particular occasion, Tyrone is not aware that the group has moved the girt before because he has been absent from school for two weeks, primarily because of disciplinary suspension. Tyrone's relation to schooling was marked primarily by failure within school spaces or removal from them. Sid remarked that the cabin-building project was a "safe" means for Tyrone to enter back into the life of the school after his extended absence. This "safety" may be first interpreted as a matter of shifting from the individual spaces of classroom work to the collective nature of the cabin-building. The histories and practices of a collective "we" being shaped by the cabin-building initiate an opening for Tyrone into collective activity that spans schooling and extraschooling contexts. While make-up work and exams await Tyrone on his return to the classroom space, with their characteristic focus upon individual effort and evaluation, the cabin-building, in its spatial scale, shifts the focus of labor and achievement to the group, and to Tyrone's ability to make a contribution through physical strength and collaborative effort.

A second means of interpreting the project as "safe" and productive for Tyrone is that it articulates an alternate path between schooling and extraschooling boundaries. Its unstable spatial location and movements, pushing upon material-symbolic boundaries between schooling and extraschooling, permit Tyrone both group access and a productive position within it. In this manner, the polycontextual path of the project may be interpreted as somewhat distant from schooling, yet bidirectionally back toward it for those historically located on school's periphery. The cabin-building and its corresponding collective culture thus appears to be an important leading activity (Leont'ev, 1981) for Tyrone on this and other occasions. Reciprocally, Tyrone's engagement and identity changes the composition and identity of the group in its polycontextual activity.

Articulating Time and Space

The foregoing discussion of social space is intended to add texture and breadth to discussions of polycontextuality. The constructs of social space as thirdspace, and of spatial scale and path are not intended as a complete "toolkit" of spatial analysis, but rather to suggest the fecund possibilities for a further analysis of spatial production across polycontexts. The analysis of space and place has been neglected and undertheorized (as physical backdrop) for much of the history of anthropology; only in the past decade or so has the significance of space in anthropology been affirmed (Kahn, 2000, p. 8). In this ongoing work, one important task is to articulate spatial and temporal processes and structures. A temporal analysis of the Walden Project might prompt us to be somewhat less sanguine in recognizing how clashes between activity systems can be unproductive, and how systematized, institutional activity can limit the ultimate meanings of work across contexts. As noted earlier, the cabin construction project was never finished, remained a frame until the following school year, and was eventually torn down. For participants, a significant frustration within the project was the lack of time. While the teachers scheduled time for the construction, and were able to exchange additional time for the students' lack of other resources (materials, expertise, space), ultimately they felt compelled by

other curricular demands, including final examinations, to pull back on the amount of time allotted to the project. Students similarly shifted their attention from the cabin project to final exams as the school year drew to a close. The time dilemma was "worked out" by passing the project onto the next year's class (a transfer that eventually failed), which was a solution more satisfactory for the teachers' sense of goals and identity than for the students'. The lack of closure on the project was potentially harmful for the group's collective identity as reflected in student interviews afterwards.

Across its developing history, timescale issues are a significant means of conceiving of the ultimate failure of the Walden Project in coming to completion. Lemke argues that the "relative timescale" of ecosocial systems "determines the probability and intensity of interdependence" among systems (Lemke, 1999, p. 2). Such timescale analysis would reveal, for instance, how the higher-level time scale process of schooling, which "sets the context which constrains what is likely and what is socially appropriate in the next scale below," (Lemke, 1999, p. 3) could predict the conflict and ultimate unsustainability of the project. More specifically, through the adiabatic principal as applied to timescale analysis (Lemke, 1999) we might pose an occasion of cabin-construction activity in relation to stabilized school timescales (e.g., the lesson, or school day) and analyze activity system conflict as the difficulty of a much slower process relating to a much faster one. While the present project is strategically shaped around the analysis of social space, it only begins to consider the complex relations of time and space in conceiving of polycontextual activity.⁹ Further analysis could extend our current understandings of multiple contexts by better articulating the temporal and spatial dynamics of multiple activity systems in contact, analyzing, for instance, the historical and geographical productions of collective and individual development, the semiotic relations of material objects as temporally and spatially constituted, and the ways in which time and space are traded upon within polycontextual activity.

Finally, what relations might we draw between the temporal sustainability of activity systems and even institutions and the learning and development of individuals? Institutional reformers

and developers of alternate activity systems are concerned with issues of sustainability, of primary importance for system development across larger scales of time. The value of polycontextual development among any social systems ought in part be measured by the yardstick of sustainability. However, the production of polycontextual activity also suggests a more modest goal than the sustainable change among activity systems or within institutions. Polycontextual construction zones provide an argument that the permanent, durable shift in practices and power relations understood as durable activity system or institutional change are a sufficient but not necessary requirement for highly engaged learning. Rather, shifting and unsustainable participation in the expansive boundary-work among activity systems and the institutions they index can produce rich opportunities for learning and identity expansion, while leaving few durable marks on institutions. The social spaces of institutions may be temporarily extended through learning by expansion, and yet retract over time. However, the historical and geographical development of the individuals shaped by such activity might be remarkably separate from the histories of relevant institutions. As such, while institutional change and sustainability is sensible for the development of new educational settings, when we place the learner (rather than the developer or researcher) at the nexus between activity systems there is already the beginning of a productive learning process which may or may not lead to institutional change.

Conclusions

Analyzing the complex arrays of activity across multiple systems in modern life prompts a shift from a purely historical analysis of activity over time to a "horizontal" analysis of activity stretched across contemporaneous, co-constructed, and dynamic social spaces. The construct of activity system and individual person expansion through inter-systemic conflict and negotiation is particularly amenable to a spatial analysis, supporting a notion of development as the stretching, collapsing, articulation, and re-scaling of social space. Mapping the expansion of "schooled" social space within the Walden Project is illustrated by an analysis of material

conflicts among systems, particularly as evidenced in spatial scale and path. A materialist account of polycontextuality involves grounding activity system constructs such as persons, tools, and community in the spatial textures and dynamics of their lived experiences, reemphasizing a notion of material contextual production over context as "surround." At the same time, to avoid the myopic fixing upon physical space alone (Lefebvre, 1991), mapping across activity systems also involves tracing the conceptions and representations of social space sustained and produced by participants through the activity. In the case of the Walden Project, the imagined geography of Walden as an historical place is illustrated as a powerful shaping context. Moreover, dynamic spatial representations developing over time—including ongoing discourse about how the project differed typical schooling—constructed its meanings through a nexus of social spaces.

As the social spaces of schooling and cabin-building conflicted on a number of levels, including scale and path, the participants engaged in an intensified level of planning and joint activity that shaped their individual and collective identities. Further, participants were confronted with of spatial scale (e.g., moving the girt) that required a new form of collective labor not inherent in either typical cabin-building or schooling activity. With respect to individual development, the data illustrates how polycontextual activity is potentially expansive for those alienated from schooling, whether they are located within schooling (e.g., Jimmy) or outside of it (e.g. Tyrone). Polycontextuality provides entrée through not only by the mediation of one context into another, but through the creation of new spatialities formed by the lamination of activity systems. Moreover, the data suggest that polycontextual relations provide openings for those successful within schooling (e.g., Trisha and Sid) to continually renegotiate and expand their identities and practices across heterogeneous and multiple terrains.

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¹ The relations among Cussin's (1992) theory of cognitive trails and other theories of social space, as they relate to learning and identity, are highly suggestive.

² This stance seems consistent with Soja (1999) as well as with Gutiérrez et al. (1999).

³ The present analysis holds polycontextual relations as a norm, and not an exception. At the same time, as an analytic tool, it casts modal schooling activity as relatively monocontextual and stable as compared to destabilized situations in which modal schooling comes into sustained contact with extraschooling, as in the cabin-building project.

⁴ Additionally, the entire daily path of students in the vocational-technical programs appeared largely separate from the path of students in the standard academic program. One of the purposes of the Academy program was to blend these paths and social spaces.

⁵ Transcription Conventions

(()) gestures and other explanations of activity

(. .) each period represents 1 second pause

= connected speech

[] overlapping speech

() inaudible speech, relative to length of space.

(girt) questionable transcriptions

Now emphatic stress

NOW very emphatic stress

°sorry° de-emphasized speech, low volume

⁶ My primary concern is the learning potentials of such expansions and rearticulations of activity and its relation to collective and individual identity. However, there are other power relations at work with respect to schooling as an institution that must be considered as well, in order to theorize the relation between institutional practice in schooling and more or less institutional practice in extraschooling. For example, Trisha's and Karen's remarks about the danger of the activity, and Sid's ironic stance, could also be interpreted as a conflict of Sid's authority with institutional and home authorities that in some sense guarantee the safety of the young people in school.

⁷ The schoolyard is produced as an institutional space in many ways. For example, when the bell rings for between-class breaks, some of the students working on the cabin cross the street, where they are officially off school grounds, to smoke a cigarette and socialize with other smokers.

⁸ Over time, as the project shifted in and out of the courtyard, some of the teachers in the school also indicated that they were more accustomed to the project and the noise associated with it, such that by the time various girt pieces were assembled and it was no longer possible to move the cabin frame, some teachers had become less resistant to the project. Thus, some evidence suggests that the school was beginning to appropriate the project—that the social spaces of the project and the school were co-developing.

⁹ The "production of space" (Lefebvre, 1991) as a concept, in fact, assumes that space develops in relation to time.