Chapter XX

Replacing Representation With Imagination: Finding Ingenuity in Everyday Practices

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This chapter is a call for consequential education research that has transformative potential: intellectually, educationally, and socially. It is about learning to see differently. It is an argument about seeing our work with youth and communities in ways that can help education researchers see ingenuity instead of ineptness and inability, to see resilience instead of deficit, and to imagine futures with youth from nondominant communities instead of imposing failure. We use the notion of "learning to see" both metaphorically and as a theoretical lens and methodological guide to illustrate how rigorous and consequential education research can help us imagine and design new forms of learning and schooling. We argue that rupturing educational inequality also involves new forms of inquiry that help reconceptualize what it means to work with nondominant communities.

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The kind of "seeing" on which we focus is undergirded by a historical epistemology (Wartofsky, 1979) that counters ahistorical and universalist notions of epistemology, the study of the nature of knowledge itself. As Wartofsky argues, how we observe, discern, or perceive has a history (p. 189). And if objects of perception are transformed by human thought and action, then perceptions are cultural historical artifacts. From this perspective, are not nondominant communities, their learning, and their worth the objectification of a mode of perception (Gutiérrez, 2016)? These are questions with which we grapple in our work as methodologists, learning scientists, and critical scholars.

As we have written elsewhere (Gutiérrez, 2016), our work is organized around proleptic and future-oriented arrangements for learning and the social world that involve more robust ways of seeing individuals, communities, and their practices. Toward this end, this review and discussion of relevant literature, including our own work, is designed to move beyond traditional questions of representation in education research toward those grounded in imagination, as Wartofsky (1979) directs us. For us, representation is deeply intertwined with how we theorize our work with communities, our knowledge of the history of their practices (including both those stable and divergent), the constructs that orient our work, and our relationship in and to the communities in which we work. However, representation also involves how we perceive the possibilities of youth and communities, an aspect that is not often addressed in traditional research. In this chapter, we call attention to the importance of employing a historicized and future-oriented ecological approach, while remaining embedded and contextualized in participants' meaningful everyday life activity to capture the fullness of people's activities, as well as their potential (Engeström, 2008). Learning to see the past and future in the present, as Cole and Distributive Literacy Consortium (2006) has reminded us, is key to co-imagining new social futures for people, their communities, and schools and to seeing ingenuity in the everyday practices of nondominant communities.

There is a long history of research that has served to pathologize nondominant communities, and much has been written in that regard. Instead of revisiting that work, we begin by contextualizing our argument in scholarship that makes visible that history of research, proffering critiques of the narrow and static frames that produce flat renderings of communities. Research that diminishes differences that matter in nondominant communities involves more than methodological sloppiness. Failure to capture the regularity and variance in communities, the nuanced textures of community members' lives, and the ingenuity that is inherent in human activity contributes to flawed research, poor educational and social policies and practices, and persistent racialized perceptions of communities and their practices. Flattened representations of communities lead us away from seeing the complexity and diversity in human activity (Gutiérrez & Arzubiaga, 2012). And in doing so, such work propels research that is incomplete and inaccurate and serves to stigmatize rather than expand our understanding of human learning activity.

We begin by highlighting the work of scholars from nondominant communities who have pushed back on the ways cultural communities have been studied and represented, and the conclusions drawn based on those analyses. We then present a

discussion of design-based research (DBR) approaches that conceptualize and engage communities as partners in addressing important problems of practice. We elaborate one particular approach to DBR, social design–based experiments (SDBEs), and address several of its key dimensions: a historicized ecological approach and a focus on people's everyday practices as a productive unit of analysis for understanding human activity and the learning therein. In the final section, we draw on our current research with a cohort of families to discuss the ingenuity in youth and families' everyday and new media practices. In particular, we focus on one kind of ingenuity, what we identify as a kind of boundary crossing, to illustrate how families innovate and leverage familial and other everyday knowledge to imagine and enact new practices. We use this work as an example of how we might reconceive our perceptions of people-in-practice, that is, the way we see and work with nondominant communities. In general, the challenge we raise here is how to do empirical work that captures the full range of a community's activities toward deeper analyses of the community's ecology, the available resources and constraints of the ecology, and the influences on everyday practices. The task becomes more complex but necessary when we account for race and ethnicity and racialized practices, and when we attempt to account for local, distal, and historical influences that mediate people's activity (Gutiérrez & Arzubiaga, 2012).

REFRAMING THE PAST FOR THE FUTURE: RESEARCH ON NONDOMINANT COMMUNITIES

In this section, we focus on how past and contemporary theorizations of and approaches to studying nondominant communities often render individuals and communities as the problem— deficient or dysfunctional—rather than addressing the relevant pressing social or educational problems. Even when it is not the intent, our analytical frames and constructs employed lie at the intersection of our methods, theoretical perspectives, our commonsense assumptions, practices, and the position of power and privilege we hold vis-à-vis the communities we study and teach (Gutiérrez, 2006). In order to call attention to this power differential and begin to counter a deficit perspective, we prefer the term *nondominant* to others such as minority, marginal, at-risk, or disadvantaged, for example (Gutiérrez, Morales, & Martinez, 2009).

We have argued that theorizing and studying communities—especially those different from our own—require us to examine the ideological positions at work in the constructs and methods we employ. We have highlighted the importance of attending, in particular, to the history of constructs we use in our research, their use, as well as the frameworks and fields in which they operate—with attention to what has been naturalized and what has been ignored. For example, there is a need to examine what has been normalized in commonplace education terms such as "disadvantaged, at risk, underclass, community, diversity, urban, rural, immigrant, refugee, migrant, English Learners, and code-switching" (Gutiérrez, 2006, p. 227). The analytical directive here is to ask, What has already been taken for granted or assumed in these concepts and their use? What are the material effects of the resulting analyses on nondominant communities and the kinds of policies and practice we recommend? These are not simply ideological questions; they are central to the conduct of rigorous, useful, and consequential research.

Nondominant communities have grown skeptical of research purported to be about or in service to them, as researchers are often complicit in framing these students in damaging ways (Gutiérrez & Arzubiaga, 2012; Tuck, 2009). Traditionally, researchers have entered communities bringing with them unacknowledged power and privileges that narrowly shape how these communities are seen (Gutiérrez, 2006). Deficit-centered research is rooted in maintaining unequal relationships between participants and investigators. Specifically, those conducting the research reify and shape a narrative of nondominant communities that centralizes damage, pain, depletion, and loss (Tuck, 2009). The resulting research often lays claim to people's existing knowledge while diminishing the value and agency of these very people in the process; ultimately, such research offers little benefit for the participants and instead allows those who are already privileged to profit (Smith, 1999).

We address in this article several ways research can undo its purpose and highlight scholarship that offers new research sensibilities. We argue the importance of examining the role that our theories and methods play in circumscribing and narrowing what can be known. Theoretical constructs rooted in deficiency can overdetermine the orientation a researcher may take toward a community and its inhabitants. Consider, for example, historian Robin Kelley's (2004) critique of the concept of the "ghetto" and the work it does to one's perception of and position toward research in African American communities. Kelley contends that social scientists constructed the idea of the ghetto in their quest to define an authentic Black culture—a perception that framed their expectation to see only destitute Black men, gangstas and thugs, and young women with children out of wedlock (p. 122). These tropes mirror rather than challenge those reproduced in popular culture and media; the resulting research furthers the deficit narrative. Kelley contrasts social scientists' reliance on stereotypical characters by referencing the "everyday people" who inhabited his diverse West Harlem neighborhood as a youth:

> Of course, there were other characters, like the men and women who went to work every day in foundries, hospitals, nursing homes, private homes, police stations, sanitation departments, banks, garment factories, assembly plants, pawn shops, construction sites, loading docks, storefront churches, telephone companies, grocery and department stores, public transit, restaurants, welfare offices, recreation centers; or the street vendors, the cab drivers, the bus drivers, the ice cream truck drivers, the seamstresses, the numerologists and fortune tellers, the folks who protected or cleaned downtown buildings all night long. (p. 122)

The specificity and variance captured in Kelley's (2004) description illustrates the merit of the mundane, the richness in the regular.

On the other hand, the persistent assumption of a homogenous African American neighborhood, as found in the "ghetto," is often extrapolated to construct a quintessential image of the Black neighborhood. As sociologist Mario Small (2008) observes,

> Ethnographers . . . describ[ing] conditions in a given poor Black neighborhood—say a drug transaction on a desolate Detroit street corner—[. . .] rely on the reader's tacit agreement that the patterns described

therein manifest themselves similarly in poor Black neighborhoods in Philadelphia, Cincinnati, Los Angeles, and other cities. (p. 390)

Research can feed this recurring imagery in popular culture by painting the ghetto as desolate without recognizing the range of inhabitation that occurs in these areas (Small, 2008). Such analyses support other broad-brush explanations for social problems. For example, in challenging the assumption that Black people remain in ghettos because they are unable to move elsewhere, Small (2008) offers, "Residential segregation results from a complex combination of institutional and interpersonal, economic and cultural, majority-driven and minority-driven factors" (p. 395). He calls for complexity that better reflects the reality of human activity, and challenges models that do not "see" the agency of either the poor or African Americans (p. 395). In fact, he argues, these models "obscure more than they illuminate" (p. 395). Conquergood (2002) discusses research conducted in this way as "epistemic violence" that forecloses the "finely nuanced meaning that is embodied, tacit, intoned, gestured, improvised, co-experienced, [and] covert" in the practices of nondominant communities (p. 146). Rather than recognizing the plethora of cultural resources that exist in communities, research has tended to focus on what is lacking.

As illustrated above, this review is concerned, in part, with how reductive conceptions of culture and traditional forms of research portray practices in which young people and their families participate—particularly those of migrant, immigrant, and diasporic communities—as being deficient or aberrant from dominant cultural practices. It is also concerned with how static notions of culture and cultural communities advance assumptions of homogeneity about nondominant communities that influences the research produced. Even when following canonical methods that conceptualize culture-as-text and fieldwork-as-reading (Geertz, 1973), we are led to believe that meaning resides in what we see if only we look hard enough. Understanding ethnography as "trying to read [. . .] a manuscript" (Geertz, 1973, p. 10) privileges ways of knowing and doing that uphold the values of the researcher, while silencing those being researched by positioning the researcher as the only possible knower of reality. As John Jackson (2013) notes, in pretending to see everything, we see less than we could (p. 14).

In his book, *Thin Description: Ethnography and the Hebrew Israelites of Jerusalem*, Jackson (2013) argues that the notion of "thin description is a response to a kind of overconfidence in anthropology, an arrogance borne of the powers that 'thick description' . . . is believed to grant adherents" (p. 13). Jackson's critique is not so much an argument about how Geertz (1973) and others privileged "symbolic interpretation to cross-cultural understanding and analysis" (p. 13); rather, the central issue is that the currency of thick description should be reconsidered. Jackson elaborates,

And these days, even shorn of its strictest Geertzian moorings, "thick description" is used like a mystic metaphor or methodological talisman that denotes an attempt at—an ambition for—rich, rigorous, and even *full* social knowing. . . . The popular imagery anthropologists use to mark this thicked knowledge is

> revealing, discussions of anthropologists morphing into "flies on the wall" or "seeing through other people's [blinking and winking and fake-winking] eyes"—or even (at the frowned-upon extreme) simply "going native." These aspirations and characterizations signal some of the hubris at the center of the anthropological project, a hubris that has always probably imagined ethnographic thickness to be far thicker than it actually is. (p. 14)

Learning how to see complexity and resilience in people's practices requires us to care for multiplicity and variance in our work. It also involves learning *where* to see. Scholars employing cultural-historical approaches to human development with interpretive and multisited ethnography argue the need for tools that better capture youths' learning within and across multiple contexts. A multisited ethnographic sensibility opens up the space for a more expansive approach to learning—one that focuses on the learning that takes hold as people move within and across practices (Gutiérrez, 2008; Vossoughi & Gutiérrez, 2014). Furthermore, when the analytical lens shifts from youths' perceived deficiencies to the ways their repertoires of practice are developed, extended, and leveraged across time and space, it becomes easier to see and "to better account for their history of involvement in a range of practices and to attend to what is learned in the boundary and border crossings, across hybrid spaces and activity system" (Vossoughi & Gutiérrez, 2014, p. 604). Drawing in part from Marcus (1995), as we elaborate later, this approach argues for a "multisited ethnographic sensibility" that understands learning as "movement" within and across activity systems—a view that recognizes that people participate and are part of multiple activity systems and that learning and human activity should be studied accordingly (Vossoughi & Gutiérrez, 2014, p. 607).

When we ground research in dominant epistemologies that are based on Western ways of seeing (Bang, Medin, Washinawatok, & Chapman, 2010), practices that are commonplace in nondominant communities become ". . . masked, camouflaged, indirect, embedded or hidden in context" (Conquergood, 2002, p. 146). Tacit forms of expression, what de Certeau calls (2000) "the elocutionary experience of a fugitive communication," require the researcher to take up new ways of seeing that open up space for the indirectness, the mundane, of the everyday (p. 133).

One example of this kind of research in education comes from the tradition of participatory design where researchers work "side by side" (Erickson, 2006) with research participants to tackle practical and theoretical problems of mutual concern (e.g., Cammarota & Fine, 2008, Gutiérrez & Vossoughi, 2010; Paris & Winn, 2013). Participatory approaches to education research highlight the intensely relational nature of conducting research with and alongside historically marginalized communities, relations that are always mediated by dynamics of race and power (Vakil, de Royston, Nasir, & Kirshner, 2016; Vossoughi, Hooper, & Escudé, 2016). Naming the often asymmetrical relationship itself can provide for richer analysis and understanding what it means to design for equity. DiGiacomo and Gutiérrez (2015) illustrate how particular social organizations of materials, peoples, and spaces afford different outcomes for community members. Specifically, the authors advance the concept of "relational equity" (p. 142) to describe the more symmetrical relationships

central to robust and equitable learning. Here, "relational equity" is both tool and object of design. These perspectives highlight that there is real (ideological *and* practical) work involved in eschewing deficit perspectives, and learning to see communities differently. Designing research studies and analytical constructs to more deeply understand and appreciate the ingenuity of diverse communities cannot be divorced from the sociocultural processes of developing trust and solidarity with communities in which the research is being conducted.

Taken together, this interdisciplinary body of scholarship repositions and remediates the researcher's perception to make possible new ways of working in and with cultural communities. It opens up spaces for new relationships with communities and new designs that orient our work.

DESIGN-BASED RESEARCH/SOCIAL DESIGN–BASED EXPERIMENTS

In the past several decades, researchers have taken up the challenge of viewing research as a means to address a range of educational problems in ways that are more useful, collaborative, and socially relevant. This focus has been particularly evident in various forms of DBR. From more classical forms of design research (Cobb, Confrey, diSessa, Lehrer, & Schauble, 2003), to design-based intervention research (Penuel, Fishman, Cheng, & Sabelli, 2011), formative experiments (Engeström, 2011), SDBEs (Gutiérrez, 2008, 2016), to participatory design research (Bang & Vossoughi, 2016; Vakil et al., 2016), research is being reconceived in ways that decenters the researchers, and reframes the aims, goals, and outcomes of research. In particular, this body of work foregrounds important principles about knowledge production and tries to advance a new generation of methods with new sensibilities. In this section, we discuss work that addresses the tension between researchers and participants in ways that trouble, realign, and leverage participants' subject positions, and, more broadly, positions new kinds of work as rigorous, thoughtful, and consequential.

There is a rich history of contribution to our understanding of the transformative potential of people in communities that are vulnerable, yet replete with possibility (Gutiérrez, Engeström, & Sannino, 2016). And new forms of research are responding to the need to expand the ways social science research is conceptualized. Gutiérrez and Penuel (2014) argue that making "relevance to practice a key criterion of rigor" (p.19) supports a more equitable and consequential way of doing research. Bringing together contemporary equity-minded research on learning with DBR, they offer methodological strategies to address inequities in social science research:

> Studying the "social life of interventions" moves us away from imagining interventions as fixed packages of strategies with readily measurable outcomes and toward more open-ended social or socially embedded experiments that involve ongoing mutual engagement. (p. 20)

By shifting normative and often deficit-reifying standards of what the "outcome" of research should be, Gutiérrez and Penuel (2014) suggest the aim of interventionist research as facilitating "participants in activity to deal with the historically

accumulated tensions and contradictions of the systems within which they work in order to transform the activity of teaching and learning" (p. 22). Their work illustrates the contemporary sentiment emerging in design-based education research. Though this approach to research is still evolving, we find it important to provide a brief history of DBR and then highlight new approaches to design research that foreground equity and transformative kinds of learning.

Design-Based Research

Design-based research is interventionist research that evolved from a commitment to studying learning environments or learning ecologies, rather than isolated individual learners (Engeström, 2011). Broadly speaking, design-based researchers aim to design, carry out, and study an educational intervention in the real world—an intervention that is informed by prior research and that will help develop a local theory of learning as well as the means to support that learning (Collins, Joseph, & Bielaczyc, 2004). DBR is premised on five tenets: (1) generation of theories about learning processes and means to support those processes, (2) highly interventionist, (3) prospective and reflective, (4) highly iterative, and (5) use of humble theories that do real work (Cobb, Confrey, et al., 2003). Working within and across settings ranging from a technology-supported intervention in a classroom, to a district-level restructuring experiment, DBR takes as its unit of analysis elements of a learning ecology such as the kinds of discourse, norms of participation, and/or tools and related material means (Cobb, Confrey, et al., 2003). The researcher(s) in DBR is expected to let prior research guide current design and carry out investigations on the enactment of a particular local theory of learning.

Design-based research has contributed in significant ways to how people learn within and across complex learning ecologies (see Cobb, McClain, Gravemeijer, 2003; Jurow et al., 2008; Lehrer, Strom, & Confrey, 2002). From the evolution of strategies such as "reciprocal teaching" and "fostering a community of learners" to the design of "intentional learning environments" (Brown & Campione, 1990; Brown & Palincsar, 1989; Scardamalia & Bereiter, 1994), DBR has demonstrated its central commitment to iteration, collaboration, and utility for practical problem solving (Penuel et al., 2011), which has the potential to improve education research, as well as learning for diverse stakeholders and populations.

While DBR is best characterized as a research approach that can entail multiple methodologies, DBR researchers share a methodological and theoretical orientation to learning as situated within complex social ecologies (Lave, 1996; Vygotsky, 2004). Despite this common orientation to studying learning in context, and because of the wide-ranging methodological possibilities inherent to DBR research, Engeström (2011) has noted that the unit of analysis has often remained vague. As a result, it has been critiqued as having a weak "argumentative grammar" (Shavelson, Phillips, Towne, & Feuer, 2003) and lack of a strong conceptual structure and/or methodology (Kelly, 2004).

While the epistemic underpinnings of DBR have led to important theoretical and methodological consequences, more attention to how equity, diversity, and the role

of participants are affected by this approach to education research is warranted. We draw here on Engeström's (2011) elaborated discussion of some of the limitations of DBR research that are instructive, while noting that later iterations of DBR have certainly been informed by first generation DBR. Engeström directs attention to the potential problematic in DBR with issues of who, what, and through what means knowledge and intended change are constructed and implemented, and raises the key question of "Who does the design, and why?" Because design-based researchers remain primarily responsible for the design, enactment, and analysis of the learning, their ontological and epistemological values and theories necessarily inform both the process and "end point" for the design experiment (Engeström, 2011). Accordingly, alongside the oft–well-intentioned and evidence-based research that informs the development of the theory guiding the intervention, there is potential for a misalignment with the ontological and epistemological values that imbue the context of the experiment itself. Said differently, because DBR is still primarily carried out from a "top-down," researcher-driven perspective, it carries with it the possibility of reifying normative and deficit-oriented conceptualizations of nondominant community practices and ways of being, as co-participation and co-design are not part of its conceptualization. As such, the transformative ability of DBR to respond robustly to issues of equity in education research and design is constrained, as well as the agency of the students and other stakeholders involved in the experiment. And despite commitment to iteration, there is a linearity to DBR that can obscure the reality that interventions are "contested terrains, full of resistance" (Engeström, 2011, p. 3).

Social Design–Based Experiments

While sharing features with more traditional forms of DBR, SDBEs depart from DBR in a number of ways, especially with regard to the roles of participants and researcher and the object of activity. Grounded in cultural historical activity theory (Cole, 1996; Cole & Levitin, 2000; Cole & Wertsch, 1997) and, in part, by the epistemological underpinnings of "formative experiments" (Cole & Engeström, 2007; Engeström, 2011; Engeström & Sannino, 2010), SDBEs evolved in response to a need for DBR to attend to issues of equity and diversity in ways that reflected the multiplicity of epistemologies that constitute a given learning ecology. While we will not elaborate SDBEs more fully in this chapter, briefly stated, the design principles foregrounded in this approach help construct an argumentative grammar built on hope and possibility. Specifically, its design principles of re-mediation, historicity, equity, resilience, transformability, and sustainability (Gutiérrez, 2016) help constitute an equity-oriented social change agenda that advances an emerging argumentative grammar that differs from others used to organize design research. What researchers do foregrounds the values and commitments of SDBEs, specifying how these commitments are operationalized in social design–based research, including how these commitments enter into everyday inquiry processes and the evaluation of the designed outcomes (American Educational Research Association, 2006; Gutiérrez & Jurow, 2014; Sandoval, 2014).

SDBEs are fundamentally about a re-mediation of the functional system (Cole & Griffin, 1986; Gutiérrez, 2005, 2008; Gutiérrez, Morales, & Martinez, 2009; Gutiérrez & Vossoughi, 2010), that is, a disruption in ways that participants in activity systems coordinate meaning with their environment. The concept of re-mediation versus remediation is more than just a play on words; it is significant to understanding transformation as the object of SDBEs (Cole & Griffin, 1983). The notion of re-mediation focuses attention to the social organization of a learning environment in ways that promote both individual and collective transformation (Cole & Griffin, 1983; Gutiérrez, Hunter, & Arzubiaga, 2009). Briefly, re-mediation involves the reorganization of systems and environments with a "conscious and strategic use of a range of theoretical and material tools" that promote learning and harness a student's repertoire of practice to create an environment where everyone can be "smart" (Gutiérrez et al., 2009, p. 12). Learning, within this perspective, is located both in the individual and the activity system itself: that is, it involves individual and collective transformation. In line with the principles of a design intervention known as a "change laboratory" (Engeström, 2011), SDBEs are oriented toward *expansive forms of learning*. Engeström and Sannino (2010) define expansive learning as "learning in which the learners are involved in constructing and implementing a radically new, wider, and more complex object and concept for their activity" (p. 2). With the development of a "mirror"[1] designed to support reflection in practice, participants are agentic in reflecting on, critically examining, and transforming their own activity in ways that lead to new concept formation, or expansive learning (Engeström & Sannino, 2010). This approach reflects an important contribution, as it puts the "primacy on communities as learners, on transformation and creation of culture, on horizontal movement and hybridization, and on the formation of theoretical concepts" (Engeström & Sannino, 2010, p. 2; Gutiérrez, 2014).

The SDBE sees design as a vehicle for equitable change and transformative learning (Gutiérrez, 2005, 2008; Gutiérrez et al., 2009). With their commitment to organizing learning in the present for the future, SDBEs embody a "productive tension between present and possible social realities" (Gutiérrez & Vossoughi, 2010, p. 111) in that they understand tensions as impetus for change, thus promoting a futuristic orientation. Social design–based researchers attend not only to the current practices of a given learning environment but also to the complex and contradictory connections that a particular community has with a particular set of local and historical practices (Gutiérrez & Rogoff, 2003). In line with a cultural historical approach, SDBEs' commitment to epistemological plurality expects disruptions and contradictions within, between, and among competing activity systems of an ecology (Engeström, 2011; Gutiérrez, 2005). These tensions and contradictions are made visible and become the object of study, design, and re-mediation. Importantly, its exploration of diversity and plurality works to account for the "repertoires of practice" people develop, bring, and leverage in learning environments (Gutiérrez & Rogoff, 2003), with a concomitant focus on identity development and the relationship between the individual and the collective.

By attempting to make visible the often seemingly neutral local practices that constitute learning environments, SDBEs add value to the critical reflection and development of both theory and local practice. For example, the cognitive ethnography written by aspiring teachers in one of the authors'[2] Fifth Dimension afterschool clubs (discussed in depth below) serves as a principal tool for mediating novice teachers' critical reflections on the often underexamined theories of learning, culture, and teaching; this is consequential insofar as teachers hold and instantiate commonsense (and often reductive) understandings of these concepts in their work with youth from nondominant communities (Mendoza, 2014; Mendoza, Paguyo, & Gutiérrez, 2015). This reflective tool is central to supporting teachers' movement from unexamined to examined assumptions about teaching and learning, and the role of culture in those processes. In this way, it is as much about teacher learning as it is student learning. Importantly, the cognitive ethnography serves to make visible and transform deficit approaches that can define power-laden spaces such as schools. SDBEs are necessarily organized in ways that facilitate the creation of learning environments built on the idea that diversity is a resource and the playful imagination a robust zone of learning, as the following examples of designed ecologies will help illustrate.

At *El Pueblo Mágico* after-school club, an SDBE modeled after its Los Angeles predecessor *Las Redes* (also considered a Fifth Dimension site; see Cole, 1996; Cole & Distributive Literacy Consortium, 2006; Vásquez, 2013), the aim is to engender transformative learning for both undergraduate preservice teachers and elementary-age youth from nondominant communities. The *El Pueblo* social design–based team works to create a playful environment that stretches the current developmental level of the children by purposefully designing activities around the co-construction of the zone of proximal development (Vygotsky, 1978). These activities, often supported through new media and digital technologies, are embedded within a hybrid environment in which multiple languages, epistemologies, and intergenerational relationships are privileged and leveraged toward engagement in joint activity.

Social design–based experiments like *El Pueblo* are designed to support and build on what the researchers know about the local community and the history of schooling and its role in the community, as well as on the "repertoires of practice" (Gutiérrez & Rogoff, 2003) children bring and can leverage in such innovative spaces. Pushing against traditional forms of afterschool educational programming and remedial approaches to learning often associated with schools in nondominant communities, designed activities offer students various entry points into higher order problem solving with technology-mediated tools, and various forms of assistance readily available, such as support from peers or more experienced others (Stone & Gutiérrez, 2007). Children from nondominant communities are not always given opportunities to partake in high-status educational programming (Ford Foundation, 2013; Nasir, 2012). SDBEs like *El Pueblo* are purposeful in attending to the ways historical and contemporary deficit beliefs and practices shape learning activity and the participants within. These designed environments build on what is known about how children learn best—that is, in contexts where children and adults co-construct knowledge through

joint mediated activity (Cole, 1996; Gutiérrez, Morales, & Martinez, 2009; Gutiérrez & Vossoughi, 2010; Vygotsky, 1978), mistakes are acceptable, and children feel a sense of social belonging and safety (Nasir, 2008, 2012).

Fundamentally, SDBEs seek to create and study change. As educational and social interventions, they design for new learning, as well as *un*learning stereotypic or deficit perceptions of learners and their communities. Gutiérrez (2016) elaborates,

> As educational experiments, like other design experiments, social design[–based] experiments are grounded in empirically-derived hypotheses about learning and human development but are iterated, implemented, and continuously reflected on, refined and repaired over the course of the experiment; in other words, these are theoretical and experientially informed models of the future that are designed, studied, and revised in the present. (p. 192)

We lift up the examples of *El Pueblo* and *Las Redes*, as they illustrate the importance of partnering and co-designing with deep understanding of communities, their practices, and their histories—that is, designing with robust notions of culture and cultural communities with which designers can better capture the fullness, variance, and complexity of communities and their members. Of consequence, SDBEs' future orientation stands in contrast with approaches that see failure instead of resilience, see despair where there is possibility, and see powerlessness where there is agency and people are historical actors.

A HISTORICIZED ECOLOGICAL APPROACH TO MORE EQUITABLE AND RIGOROUS RESEARCH

Design-based approaches to research such as SDBEs invite ecological approaches that direct us to examine and consider proximal and distal influences on human activity. Motivated by a commitment to transforming the educational and social circumstance of youth from nondominant communities, SDBEs centralize the development of learning ecologies that are foremost equitable, resilient, robust, and sustainable. Scholars have long critiqued traditional laboratory-based experiments, which produce results that are not relevant beyond the lab (Barker, 1968; Gibson 1966; Neisser, 1976). In contrast, we use ecological approaches, which are based on the idea that human development takes place through processes of progressively more complex reciprocal interaction between the human organism and the people, objects, and symbols in its environment (Bronfenbrenner, 1994). Moreover, the form, power, content, and direction of these interactions—or "proximal processes"—vary as a function of the developing person, the environment, and the nature of the developmental outcomes under consideration (Bronfenbrenner, 1994, p. 38). An ecological understanding of human development suggests that because the process and product of making human beings varies by place and time, the fact that there are ecologies yet untried indicates that there is also potential for human natures not yet seen (Bronfenbrenner, 1994).

In foregrounding the affordances of an ecological approach, Cole, Hood, and McDermott (1982) have argued that experiments must account for context and a

deep understanding that context must inform how behavior is conceptualized. We are aware that the term *context* has been used in differing ways. One understanding interprets context as nested levels (Bronfenbrenner, 1994) surrounding the individual. Although powerful in turning the reader's attention to proximal surroundings, this interpretation fails to account for the interconnectedness of space and time and the mutual constitution of human activity. Moreover, such an understanding of context also lends itself to the interpretation of context as static. In contrast, Vygotsky limited the concept of *context* to descriptions of written and spoken word; context beyond language he framed as *situation* or *ecology*. Thus, a Vygotskian perspective leads us to an understanding of ecology as interwoven and "actively achieved" (Cole, 1996, p. 134), "like tangled roots" (Packer, 2010, p. 24), rather than concentric circles (Gutiérrez, 2016). It is important to understand human behavior in the contexts of our full ecologies, because activity systems all exist interdependently as ever-changing, fluid practices, which are grounded in a larger history (Cole, 1996; Lee, 2010).

In taking an ecological approach, we also center the importance of "seeing" historically across multiple time scales. In cultural historical activity theory, time scales emphasize the way that multiple domains of history, including the history of our species (phylogenies), the history of the cultural group into which we are born (cultural-history), the history of an individual human being (ontogeny), and the moment-to-moment interactions of the present (micro genesis) all influence the construction and interpretation of the current situation (Cole, 1998). Thus, each moment is interwoven with not only the surroundings in the present day but also the historical legacy of each time scale that manifests through artifacts, including language (Cole, 1998). Historicity is thus fundamental for developing a full understanding of the structural conditions that mediate people's lives, as well as how people come to see who they are and who they can become (Gutiérrez, 2016). In centering historicity, we are better able to understand the tensions, constraints, and possibilities of activity systems (Engeström, 1999) and focus on the history of people's participation in practices to understand what gives meaning to their lives (Gutiérrez, 2016).

Moreover, a historical view enables us to "see" differently and thus create resilient learning ecologies by attending to the history of the ecology, its participants, its resources, its level of diversity and identifying potential threats to the ecology's resources, health, and resilience (Gutiérrez, 2016; Gutiérrez & Jurow, in press). Resilient ecologies refer to a community's ability to cope with, shape, and adapt to social, political, and environmental changes (Adger, 2000; Brand & Jax, 2007; Folke, 2003, 2006; Gutiérrez, 2016) and are diverse, transformable, and sustainable (Walker & Salt, 2006). Most research on resiliency focuses on an individual's ability to transcend difficult circumstances (e.g., Garmezy, 1991; Rutter, 1987, 1990; Werner, 1990, 1993). However, in discussing *resilience*, we are concerned with not only individuals but also the larger sociocultural and activity systems in which they are embedded. This is especially important in designing learning ecologies for students from nondominant communities. Rather than viewing a student as deficient in a particular skill set, we aim to understand the student's history of involvement in that practice. By paying attention to the student's ecological history, and developing a broader

picture of the tools, support systems, and constraints available to the student, we are better able to design new tools and arrangements for proleptic learning, for learning in the present for the future. In contrast to deficit perspectives of nondominant communities, we argue that the development of sustainable and resilient learning ecologies allows for an approach to learning and design that recognizes students' full humanity (Gutiérrez, 2016).

An ecological approach is also concerned with what people learn in their participation in everyday practices. de Certeau's (1984) study of the ways by which people individualize mass culture to make it their own has served to reorient our understanding of the everyday. In *The Practice of Everyday Life*, de Certeau argues that cultural consumption of rituals and representations produced by the dominant social order is in actuality also a production. Ordinary people *make* the rituals, representations, and laws imposed on them into something different from what the dominant social order intended. This act of enunciation—or reappropriation—is thus also an act of subversion. Drawing on Foucault's work, de Certeau notes that if power currently operates through "miniscule" technical procedures, the infinitesimal transformations ordinary people make of and within the dominant cultural economy are in fact political acts. In other words, there is a political dimension to everyday practices. For de Certeau, these procedures of the everyday—the reappropriation *made* by consumers—can serve as a therapeutic for the fragmentation of today's social fabric.

This concept of everyday practices as political resonates strongly with our work on "learning as movement." As argued in previous work, learning as movement describes the ways by which historical actors deploy repertoires of practice across time, space, and activity to experience possible futures (Gutiérrez, 2008). In other words, in entering a practice, all learners also reinvent that practice, opening up new possibilities for and understandings of the self (Vossoughi & Gutiérrez, 2014). In lieu of "vertical" trajectories of learning, which assume that there is a linear trajectory from novice to expert, we focus on what scholars have called "horizontal," or everyday, forms of learning (Tuomi-Gröhn, Engeström, & Young, 2003). Such a perspective centers the learning that emerges as people, tools, practices, and interests move across settings, social contexts, or activity systems. In attending to horizontal forms of learning, we highlight how practices are transformed and hybridized, rather than merely reproduced or applied. This in turn sheds light on the ways by which expertise is in reality a distributed phenomenon. An understanding of learning as movement also attends to the ways that tools enable or constrain learning across practices, and illuminates the ways in which tools and practices get reorganized as people move within and across ecologies (Gutiérrez, 2008; Vossoughi & Gutiérrez, 2014).

In our work with nondominant youth and their families, we have documented learning as movement and transformation across the contexts of the school, home, and community, and we use this work as arguments for highlighting the importance of focusing on everyday practices and routines across ecologies to understand human activity (Weisner, 1998). We use mixed methods but privilege multisited ethnography (Marcus, 1995) to develop a historicized understanding of students' learning

ecologies. A multisited ethnographic sensibility enables us to honor the ways by which people are simultaneously part of multiple activity systems, and methodologically acknowledge that it is within multiple activity systems that cross place, space, and time that people develop repertoires of practice (Vossoughi & Gutiérrez, 2014). In his early work, Marcus (1995) defined multisited ethnography:

> [moving] out from the single sites and local situations of conventional ethnographic research designs to examine the circulation of cultural meanings, objects, and identities in diffuse time-space. This mode defines for itself an object of study that cannot be accounted for ethnographically by remaining focused on a single site of intensive investigation. It develops instead a strategy or design of research that acknowledges macrotheoretical concepts and narratives of the world system but does not rely on them for the contextual architecture framing a set of subjects. This mobile ethnography takes unexpected trajectories in tracing a cultural formation across and within multiple sites of activity that destabilize the distinction, for example, between lifeworld and system by which much ethnography has been conceived. (p. 96)

In being mobile, multisited ethnography creates space for an ethnography of movement and change (Vossoughi & Gutiérrez, 2014) and shifts the methodological gaze away from students' perceived deficiencies toward the ways youth practices are developed across time and space, in sites of boundary crossing and hybridity. Multisited ethnography is also appropriate for our research and move toward re-mediation (Gutiérrez et al., 2009), which aims not to "fix" people and their communities but to re-organize, or transform, systems of activity so that participants can become designers of their own futures. In documenting student practices across space, time, and activity systems, we are able to design for learning ecologies that allow for students to become "historical actors," subjects who are able to see historically so that they can transform their own sociohistorical circumstances and futures as learners and agents of social change (Espinoza, 2004; Gutiérrez, 2008). In understanding the present as a product of history and as the starting point for the future, each actor, or more specifically each interaction, has the potential to create change and to redefine practices and boundaries. It is in this view of the present that we invite a reimagination of ingenuity as part of everyday practices.

LEVERAGING EVERYDAY EXPERTISE

We use our study, "Leveraging Horizontal Expertise: The New Media Practices of Latino and Working Class Families," as a case for examining the importance of studying people's everyday activity. In this SDBE, the "where" and the "how" of seeing youth, families, and their practices differently can be illustrated. Specifically, our analysis of a rich corpus of data on families' everyday lives, including their new media practices, has engaged "new ways of seeing." Building, in part, on our previous University of California, Los Angeles (UCLA), study on the middle-class lives of working families in Los Angeles (Gutiérrez, Izquierdo, & Kremer-Sadlik, 2010; Ochs & Kremer-Sadlik, 2013), the present study was interested in the learning that occurs in people's movement across everyday practices (i.e., learning as movement) and the resulting "repertoires of practices" that are constructed and leveraged across time and space.

This was a multisited ethnography in which we observed 60 to 75 youth from our STEM-oriented afterschool club, *El Pueblo Mágico*, and a subset of 14 of these youth and their families. As part of the study design, we worked with these families to jointly document families' everyday practices and their uses of new media across a range of settings and activities. For 3 years, we spent a minimum of 8 hours in the homes of 14 families from low-income communities—the majority of whom were a heterogeneous group of Latino families—and collected an extensive data set that included home videos taken by researchers, youth, and other family members, family-generated videos, new media surveys, artifacts, and interviews. We especially learned about families while interacting with them and while documenting and understanding family and individual's daily routines and their beliefs and practices around health, new media, social networks, education, and energy use. The field notes written by undergraduates working and learning with children in *El Pueblo Mágico* and artifacts produced by the children and their adult amig@s in joint activity were important to understanding children's movement across settings.

Our work in leveraging horizontal or everyday expertise examined how tools and practices traveled, got taken up, or were reorganized and reinvented in that movement across people's ecologies. In particular, we examined the new media and everyday practices of families, and in the course of doing so, we began to document the novel, interesting, and creative ways families took up new media tools toward new ends. But there was more than their ingenuity with new media practices; we also documented the range of inventive ways they lived socially. Ingenuity became an important empirical and theoretical focus. As we will elaborate below, we conceptualize ingenuity from a generative frame that takes into account ecological factors and strategies for negotiating the complex and dynamic movement of working-class families. From this view, human ingenuity is constituted by the complex, dynamic, everyday practices in which families engage routinely and over time. Informed by Vygotsky's (1978) notion of the playful imagination that is fundamental in a range of ways to ingenuity, thus far we have identified the following kinds of everyday ingenuity in family practices: playfulness, resourcefulness, making, tinkering, fixing, and new forms of boundary crossing.

INGENUITY

We situate our notion of ingenuity in everyday creative responses to constraints and (un)intentional moves to blur boundaries. Being attuned to the ways in which people interact, create, and are influenced by their surroundings is an essential part of reframing the everyday as a wellspring of ingenuity. Through careful observation of the mundane, the problem solving, creativity, and resilience that often drive routine practices undiscerned come to light. The prevalent perception of ingenuity is that it is a "skill or cleverness that allows someone to solve problems" ("Ingenuity," n.d.). This approach centers ingenuity as an individual achievement, and one that is often extraordinary. Such a conceptualization is problematic in that it advances assumptions that ingenuity is a property of the exceptional mind rather than an everyday

phenomenon distributed across people, environments, and materials (e.g., Gutiérrez, 2008; McDermott & Raley, 2011; Pea, 1993). Moving beyond narrow understandings of ingenuity as individualistic and rare requires new ways of looking for and at performances of skill, inventiveness, and resourcefulness as people encounter and respond creatively to constraints in their everyday environments. Looking anew does not come easily; it calls for willingness and training to frame and reframe how we view ingenuity (McDermott & Raley, 2011; Mendoza, 2014). However, with eyes wide open, we can see that ingenuity is much more than an individual, exceptional attribute; it is embedded in people's interactions with and across their everyday resources. Focusing on the everyday as a natural—and often overlooked—site/sight[3] for ingenuity can help us question categories that may otherwise go unchallenged, and identify solutions that can address the institutional constraints in which people are placed.

New understandings of ingenuity require replacing entrenched assumptions about where we see ingenuity and how we recognize it. In other words, locating ingenuity in the everyday is both an empirical and a theoretical undertaking. Scholars such as McDermott and Raley (2011) have pointed to school environments as prime examples of prosaic places where ingenuity is abundant but often missed due to narrow scope of vision. In their study of a reading lesson in a kindergarten classroom, these authors demonstrate how one of the Spanish language–dominant student's (Alexis's) achievement of reading was actually the result of "arranging bodies, materials, and talk to keep people in their respective positions" (p. 382) rather than successful, solitary decoding of text. In broadening their vision to include the other kindergarteners who helped Alexis "read" through their interrupting, pointing, and whispering, McDermott and Raley illustrate the distributed nature of performances of competence that are often seen as individualistic. By looking closely and differently at a string of seemingly unremarkable classroom interactions, they highlight how knowledgeable, imaginative, and resourceful children are in school, a fact often lost in standardized "intelligence measures." Ingenuity, they argue, is not a characteristic of the exceptional mind but rather the agentive repurposing and reorganizing of "materials and persons and moments at hand . . . into something interesting, fun, or new" (p. 387).

Drawing on McDermott and Raley (2011), Gutiérrez and Barton (2015) argue that all human activity is always socially organized, including in classrooms. In their discussion of how the social positioning of the classroom is a collective social accomplishment, Gutiérrez and Barton advance a discussion of how the social order of classrooms implicates which students get positioned as successful while others less so, and whose ingenuity gets valued in science classrooms. The authors provide a vignette to illustrate this point.

Akira is the top student in her science class. Not only is she the best reader in the class, she is familiar with and can detail her understandings and arguments with care and precision. While there is no doubt that Akira is an accomplished student with her own history of engagement in a range of practices, how we understand and the assumptions we hold about her status in the social order of the classroom is often misunderstood as a sole accomplishment. However, if we were to document carefully and observe how the

social life of the classroom gets constituted, we could unpack how learning and its social situation get organized in ways that make Akira the "best" student in the class. We would ask ourselves: What work gets done for this to happen? What gets organized and reorganized in the classroom? And in what ways does this positioning of youth influence how science learning is accomplished? (p. 574)

The social organization and making of the "best" student has important implications for whose knowledge and practices are taken up. It is in the acknowledgement and leveraging of youths' repertoires of practice, the knowledge and expertise developed across everyday practices and settings of the ecology, that the buds and kernels of ingenuity, the roots and possibilities of youths' playful imagination, resourcefulness, and inquisitiveness are revealed. The social order of classrooms and attendant practices we describe have particular significance for how deficit frames, social relations, and opportunity spaces are created and maintained for youth from nondominant communities.

In the same vein, Gutiérrez (2008) shows us that ingenuity is also revealed as people develop and leverage expansive repertoires of practice across multiple settings and communities. With a team of colleagues, her long-term design and study of the Migrant Student Leadership Institute (MSLI) at UCLA, a residential summer program for high school students from migrant farmworker backgrounds, has emphasized the development of powerful literacies as both everyday and institutional literacies are reframed in the students' movement across settings. The MSLI learning ecology was intentionally designed to counter English-only, one-size-fits-all policies and practices and reveal "how people are made smart by use of artifacts and participation in particular social groups and settings" (Gutiérrez, 2008, p. 150). The program supported students in developing sociocritical literacy (Gutiérrez, 2002) and "[reconceiving] who they are and what they might be able to accomplish academically and beyond" (Gutiérrez, 2008, p. 148). In creating learning opportunities mediated by a wide range of tools in natural daily activity (e.g., during walks on the UCLA campus, in residential life, at mealtimes) and in formal instructional activity, the program made space for students to reframe themselves as historical actors in "the world as it is and the world as it could be" (p. 160). Helping youths see their past, present, and future differently is a major design objective of the MSLI program, as is "retraining" the vision of educators and researchers so that they can see the transformative potential of leveraging horizontal and vertical forms of learning. Learning and creativity were everywhere, from the spaces where *teatro del oprimido* (theatre of the oppressed) took life to the writing of students' *testimonios* about what it meant to be a migrant farmworker in the United States. As we have written previously (Espinoza, 2009; Gutiérrez, 2008; Vossoughi & Gutiérrez, 2014), space, place, and time were transformed and reimagined by instructors and students as they engaged in collective forms of learning and imagining referred to as "social dreaming"—the collective imagining of a more just educational and social world.

Studies such as these illustrate empirically where we might look for ingenuity in our day-to-day surroundings. Where we look, however, cannot be separated from the

theories that inform how we look for ingenuity. Situated views of learning and development guide our analyses of ingenuity as a distributed phenomenon in our families' everyday practices. Approaching ingenuity as an everyday, distributed phenomenon, it is not difficult to see across our varied and rich family data how resourceful, clever, resilient, and inventive the participating family members were as they reconfigured and reimagined their available resources to address constraints in their surroundings. Attending to how families in our study transgressed the rules and constraints in their routines has helped us recognize "ingenuity in everyday moments." We exemplify this theoretical point in one salient example of the everyday ingenuity observed in our participating families; we describe here how one of the mothers, Katie, transformed commonplace resources and constraints into opportunities within the daily routine to support her children's learning.

A divorced parent to three young children (Jake, 11; Mary, 8; and Andrew, 2), Katie had made the decision to undertake a twice-daily commute between the house she had shared with her ex-husband in one town and the children's school and day-care in another small town in order to provide her children with stable routines. With her ex-husband working away from home during the week, Katie and her children braved long morning and evening commutes between the two cities. A self-employed massage therapist who worked from home and also traveled to clients, Katie shared that her various daily responsibilities necessitated precise coordination of family routines. Although commuting commanded time that could be used for work, Katie highly valued her children's academic improvement and the support programs available at their current school, including our after-school program in which her children were enrolled. As a result, Katie chose to manage the constraints she faced rather than relocate her children.

As part of joint study of families' everyday practices, Katie created the "morning routine" videos that all of our participating families recorded. One video captured the hour before they all left together for school, day care, and work and the other captured the family's 17-mile commute from their home to where the children went to school in a nearby town. Alternating her video camera to capture the scenic drive, the cars in front of her, and, briefly, her sleeping children, Katie narrated the drive, describing this daily commute as "annoying" due to the steady single line of traffic that defined their commute. The long but necessary commute was understandably trying to Katie, a busy single parent. However, it is in this seemingly mundane routine that we can see ingenuity and, thus, Katie's creative response to the particular constraints posed by this commute. Despite the tediousness of the drive, she saw it as a time they could use productively as a family. She explained that she and the children often used the drive back home to do homework, practice reading, and "problem solve out loud." For example, after having her two school-age children read assignments aloud, she would help them think through the answers. Katie also explained that due to the stretches of idling in slow traffic, her children could get some writing done as well without worrying about shaky printing. Math problems could also be completed in the car so that the answers were ready to be checked by Katie once the family reached home. Near the

end of the video, Katie referred to this commute as "good time" because she and the children "[tried] to be productive." In reorganizing time, space, children, and materials, Katie restructured a mundane commute and repurposed it to promote family interaction and her children's academic achievement through literacy learning, math talk, and problem-solving. As in the case of young Alexis described by McDermott and Raley (2011) earlier, we argue that Katie demonstrated ingenuity through this organization of everyday learning in a way that mattered most for her family.

A Theoretical Note: We insert a theoretical note here to further ground our notion of ingenuity as a rich site of learning. In particular, we draw on the work of Russian psychologist Lev Vygotsky (1978), as a Vygotskian approach to learning and development requires critical attention to more than just the individual learner; it also involves attention to the social context of development in which the learner is developing, whether in informal or formal learning spaces. We briefly review some key and relevant principles to illustrate how this view of learning orients researchers to the affordances of understanding people's learning in everyday activity, including play and the playful imagination as rich zones of learning and development (Vygotsky, 1987).

We believe Vygotsky's views of play and cognition are worth revisiting as they provide a context for understanding why play is a natural site for seeing everyday ingenuity. In his writings on play and child development, Vygotsky (1967) distinguished play—specifically, pretend play—as a dynamic social activity that requires and leads to complex symbolic constructions, emotional impulse control, and experimentation with behavioral rules. Vygotsky attributed the appearance of play to the child's interest in attaining personal desires. As these desires are largely unattainable in reality, the child creates an imaginary situation to realize them. According to Vygotsky, "[A]ction in the imaginative sphere, in an imaginary situation, the creation of voluntary intentions, and the formation of real-life plans and volitional motives–all appear in play and make it the highest level of preschool development" (p. 16). It is within this first kind of early childhood play that "a child's greatest achievements are possible" (Vygotsky, 1987, p. 100). Although the concept of the ZPD (zone of proximal development) has often been taken to literally refer to a child being assisted by a single more knowledgeable other, Vygotsky's view of play expands the idea to include assistance provided by a group (e.g., of peers, as we saw in the analysis of Alexis and her classmates; McDermott & Raley, 2011).

In particular, Vygotsky's (1978) notion of the playful imagination offers us a generative lens for understanding the ingenuity of families in their everyday lives. He notes that all play creates an imaginary situation and all imaginary situations contain rules that are reflective of societal norms. It is through play that the child is able to gradually learn to transcend her reality. As Vygotsky notes,

> Play is a transitional stage . . . At that critical moment when a stick—i.e., an object—becomes a pivot for severing the meaning of horse from a real horse, one of the basic psychological structures determining the child's relationship to reality is radically altered. (p. 12)

By engaging her playful imagination, a child moves from being constrained by her situation to thinking beyond constraints. She can recreate and, in doing so, even transgress, her surroundings in this creative space. As Cole and Griffin (1986) have noted, play is not just the domain of children; it is a leading activity that spans the lifetime. In this view of constraints and playful imagination, we ground our analysis and understanding of ingenuity as altering and bending rules and blurring boundaries to achieve goals through playfulness, resourcefulness, making, tinkering, fixing, creativity and boundary crossing.

BOUNDARY CROSSING AND *LINE-STEPPING* AS INGENUITY

In this article, we have expounded on the importance of examining learning as work that is done across both vertical and horizontal dimensions of development (Cole & Gajdamashko, 2009). We see boundary crossing as part of the domain of ingenuity, as boundary crossing especially attends to horizontal dimensions of learning, bringing to the fore the everyday ingenuity in movements through and across domains of practice. We build on expansive notions of learning to argue that boundary crossing requires re-mediation of reductive constructions of nondominant communities. Moreover, we contend, as have others (cf. Bang & Vossoughi, 2016; Engeström & Sannino, 2010; Jurow & Shea, 2015; Vossoughi & Gutiérrez, 2014), that researchers often fail to capture ingenious practices that occur in the horizontal movement of knowledge and the boundary crossing that is part of such practices. In our present study, we have gained a better understanding of how families take up the tools and resources available to them by tracing their movement and the boundary crossing that are part of their everyday practices. We argue that boundary and border crossing, as critical dimensions of ingenuity, offer theoretical and practical means for us to see differently. Of special interest to us are the observations of youth engaging in boundary crossing acts that are ingenious and rebellious, a point we will discuss shortly.

As discussed earlier, methodological focus on everyday practices is important to seeing novelty, creativity, and ingenuity in people's activity. There is particular analytical affordance in understanding the practices that thrive on the boundary and the hybridity and counterscripts that help characterize agency, transformation, and openings for those navigating cultural, affective and cognitive borderlands (cf. Anzaldúa, 1999; Gutiérrez, Rymes, & Larson, 1995). As conditions for ingenuity, boundaries and borders are not strictly instruments for exclusion that restrict the flow of people and ideas; rather as Conquergood (2002) contends, boundaries are more akin to membranes than walls. Approaching boundaries as fluid and dynamic can help researchers notice how boundaries and borders are often altered by the very people they are designed to exclude (De Genova, Mezzadra, & Pickles, 2014; Hand, Penuel, & Gutiérrez, 2012).

In this section, we begin by examining the analytical purchase of boundary crossing in our exploration of ingenuity with nondominant communities, recognizing

that much has been written about boundary crossing in education research (Akkerman & Bakker, 2011; Akkerman & Bruining, 2016; Garraway, 2010). We continue our review and offer theorizations of boundary crossing that are particularly expansive for understanding people's agency and everyday forms of resistance (Pacheco, 2012).

Akkerman and Bakker (2011) describe a boundary as "a sociocultural difference leading to discontinuity in action or interaction" (p. 133). As such, boundaries and borders can be both material and ideal, ideology playing a role in the formation of both. In education research, material boundaries are those that physically exist between school, after-school activities, home, and community (Barron, Gomez, Pinkard, & Martin, 2014; Soep & Chavez, 2010; Willis, 1977). Ideal boundaries can encompass the explicit and implicit norms that learners are expected to conform to as they move across various contexts (Givens, Nasir, ross, & de Royston, 2016; Love, 2012; Nasir, ross, de Royston, Givens, & Bryant, 2013; Vaught, 2004). However, crossing boundaries amplifies tensions between the activity systems and the individuals moving across them. These material and ideational manifestations of borders attune us to the ways ingenuity can be sparked through negotiating discontinuity and encountering the unfamiliar (Suchman, 1994).

In our own study of everyday working-class family life, we perceive youths' ingenious, subversive, and rebellious acts of boundary crossing as attempts to present more authentic, often liminal, selves. At times, these transgressions can seem fleeting and even inconsequential; yet a momentary *queering* of time and space can expand our field of vision to the transformative potential in testing and pushing established norms, acknowledging and contesting boundary lines. To better understand the experiences of those occupying liminal spaces, we turn to queer theorizations of boundary crossing as a robust and refined lens for queering the familiar and seeing the ambiguity and playfulness of movement across material and ideational domains (Halberstam, 2005; E. P. Johnson, 2003; J. M. Johnson & Nunez, 2015; Royster, 2012). These are scholars who have radically pushed disciplinary and epistemological boundaries, challenging researchers to look at the communities we study in more dynamic ways. We draw on the work of queer scholars of color, in particular, to gain insight into the pliable nature of boundaries and in the process see where boundaries blur, blend, and at times rupture, bleeding across ecologies.

The works of Gloria Anzaldúa (1999) and José Esteban Muñoz (1999) have been especially instrumental in expanding our field of vision. Their scholarly contributions re-mediated old ways of seeing, offering us new lenses and alternative spaces for making sense of the lives of nondominant communities. Muñoz advances the concept of disidentification as a means for crossing and contesting the borders and boundaries set forth by coloniality's normalizing White and heteronormative impulse. As Bhabha (1990), Soja (1996), and Gutiérrez (2008) have posited, this is achieved not by identifying with or rejecting prevailing ideologies but by operating within a third space where the disidentificatory subject "tactically and simultaneously works on, with, and against a cultural form" (Muñoz, 1999, p. 12). Muñoz's notion of disidentification provides a generative frame for looking at the ideational resources required of

nondominant learners who sit at the intersection of multiple borders. Ideational resources refer to an individual's perception of self (Norris, 2014) and "place in a practice in the world, as well as ideas about what is valued and what is good" (Nasir, 2012, p. 110). For Nasir (2012), ideational resources, including how an individual negotiates them in schooling practices, influence the formation of racialized and academic identities. These resources not only are key to racialized identities but also have affordances for the construction of gendered identities, identities also mediated by the materials within schooling contexts, as well as notions of self and relationships with others. Here, the transformative potential of boundary crossing practices begins to emerge.

In *Borderlands: La Frontera*, Anzaldúa (1999) describes the transformative potential of "crossing borders" as a queer Chicana. As an act of rebellion, boundary crossing was a reaction to cultural forces that expected her to conform to normative conceptions of being a woman and of being a Mexican, specifically. Anzaldúa's quest for enacting a hybrid identity required transgressing the borders erected around gender, sexuality, and language, leaving her in 'the borderlands' (p. 37). Anzaldúa's experience presents us with a way to look at boundary crossing as transformative, rectifying the dissonance between an authentic self and the norms perpetuated through oppressive structures. The agency and rebellion modeled by Muñoz (1999) and Anzaldúa (1999) lend us new orientations for seeing what Pacheco (2012) has referred to as enactments of "everyday resistance" (p. 121) by youth in nondominant communities, while also illustrating the political impetus behind attempted and successful boundary crossings.

In our research, we have witnessed agentive, rebellious, and political attempts at boundary crossing by nondominant youth. This focus on the everyday practices of youth has allowed us to see the gradual progression—characterized by the queering of norms—toward the crossing of boundary lines, a progression that we have theorized as *line-stepping*. The concept of line-stepping opens up a new way of seeing ingenious boundary crossing in action, that playful resistance that occurs at the time that the boundary *line* is acknowledged and engaged. Line-stepping necessarily involves a playful imagination and can bring new degrees of freedom, but as with any playful and/or transgressive act, including acts of resistance, line-stepping is not free of rules or of potential consequence.

Our use of the term *line-stepping* derives from comedian Dave Chappelle's hit television series, *Chappelle's Show*. In a recurring segment titled "Charlie Murphy's True Hollywood Stories," cast regular Charlie Murphy recounts his memorable encounters with A-list celebrities. In the first installment, Murphy reenacts his experiences with funk music superstar Rick James (played by Chappelle in the skit). Murphy describes the volatile nature of their relationship, which often resulted in physical altercations between the two men because, as Murphy puts it, James "step[ped] across the line, habitually" (Brennan, 2004; Chappelle & Brennan, 2004). Chappelle's portrayal of James as a "habitual line-stepper" is productive for marking the outer edges of transgressing boundaries. However, the privilege associated with

James's age, gender, class, and sexuality enables his reckless disregard for societal norms. Without such entitlements, most youth are required to tread familial and societal boundaries with a much lighter touch than the musician. Thus, our conceptualization of line-stepping pivots from Murphy's in that it describes a form of transgression that is processual, more methodical, and often executed with deftness and some sense of consequence and caution.

Line-stepping is an instantiation of boundary crossing where an individual deliberately and consciously pushes against society's ideological constraints. Rather than seeing boundaries as static, we recognize their dynamism. By subtly identifying and testing a line, the line-stepper learns how and where lines are permeable and the available latitude in their enforcement. At times, youth will encroach the lines without going over them; at other times, they will cross the lines, attempting to ascertain the severity of the consequences of their boundary crossing. In our study, we saw youth engage forms of line-stepping as they challenged established gender norms around video game playing or acted in ways to counter deficit school labels through their online identities.

Through analysis of youths' routine activity, we found line stepping to be a collective and distributed activity, where youth employed the assistance of those in their home to push boundaries in ways they found meaningful (McDermott & Raley, 2011). It is important to note that this defiance or testing of the rules is not the result of ignorance. Rather, intimate awareness of the lines is a prerequisite for their skillful manipulation. Hearkening back to Vygotsky's (1978) notion of play, we also understand young people's line-stepping as a form of transcending reality through the engagement of the playful imagination. What is implicit in our conception is the acknowledgement that lines can and often do change. We propose such line-stepping as something that youth, in particular, engage in, as they playfully (and sometimes more seriously) negotiate with the bounding rules and norms of the multiple activity systems in which they participate. By seeing young people as "habitual line-steppers," we view their actions as agentic and deliberate and recognize how they can move the lines that are used to demarcate "appropriate" behavior. In looking anew at the everyday, the seemingly mundane and subtle, we are able to see the creative ways youth engage in redefining themselves and the worlds in which they live. The analytical concept of line-stepping offers a way to more fully conceptualize youths' deployment of their repertoires in sense-making activity, and to more accurately capture how youth negotiate the demands of family, school, and social life.

CONCLUSION

Education research has had a complex history and role in the schooling of youth from nondominant communities. In line with the call of this special issue, we have addressed how particular analytical frames and methodological approaches have had deleterious effects on the social and educational opportunities, trajectories, and social futures of these youth. We hoped to advance a conversation about what it means to conduct consequential, robust, and respectful research in partnership *with*

nondominant communities. Specifically, we advanced an argument about rethinking education research in ways that could help researchers see ingenuity and new forms of agency in youth and communities that have heretofore been perceived through a reductive and racialized lens. Toward this end, we marshaled scholarship that provided insight, frames, and tools for learning to see and engage our work differently, to see the link between how we theorize and study nondominant communities.

Drawing from our current study Leveraging Horizontal Expertise: Understanding the New Media Practices of Families,[4] we also discussed SDBEs, a form of design-based inquiry that is organized around a new social imagination about how to do consequential research with nondominant communities. Notably, the historical and ecological concerns central to this methodology privilege a focus on the everyday and on the learning that takes hold as youth move within and across activity systems, that is, their repertoires of practice. Its critical cultural historical theoretical approach offers new analytical tools to help social scientists see ingenuity and possibility instead of deficit. In particular, a focus on boundary crossing and line-stepping as forms of ingenuity offer new ways of "seeing" youths' learning-in-activity more expansively.

NOTES

The Berkeley MacArthur Connected Learning Research Network authors are listed alphabetically. The conceptualization and writing of this article were equally distributed across all authors and should be understood accordingly.

[1]The mirror is a tool "used to stimulate involvement, analysis and collaborative design efforts among the participants" (Engeström, 2011, p. 14). For more on the "'mirror" in SDBE, see also Mendoza (2014).

[2]Gutiérrez served as principal designer and director of two designed after school environments in Los Angeles, California, and Boulder, Colorado.

[3]Parham (2009) finds Nora's (1989) theorization of *les lieux de mémoire*—sites of memory—useful for examining the relationship between memory and haunting in Black life. She notes,

> Site/sight: where we put it, how we see it (or the myriad ways we see without seeing—hauntings, specters, and uncanny repetitions); site/cite: where we find it (the dig site, the grave, the Middle Passage), how we express it, or how loss informs or structures experience—citationality. (p. 10)

P. Johnson (2014) draws on Parham's work in his analysis of haunting and the Black athletic body in ESPN's *30 for 30* documentaries.

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