Framing Sociocultural Interactions to Design Equitable Learning Environments

Bryant Jensen, Ph.D., Brigham Young University
206-T MCKB Provo, UT 84602, bryant_jensen@byu.edu

Abstract: Many racial and ethnic minority (REM) students (i.e., African Americans, Hispanics, Native Americans, Pacific Islanders, and some Asian Americans) in the U.S. continue to underperform on academic tasks. Partially but not entirely explained by socioeconomic factors, REM underperformance is associated with different and inequitable sociocultural demands between informal and formal settings where REM children learn and develop. "Culturally responsive" classroom teaching is posited to help remedy this situation, but conceptual clarity and empirical support are limited. To address these limitations I recommend the learning sciences closely study cultural dimensions of social interactions across diverse classroom settings. Derived from a synthesis of research and theoretical traditions, I present an emergent framework of sociocultural interactions in classroom settings—10 dimensions organized into three domains: Life Applications, Self in Group, and Agency. I describe the constructs and address implications for design research: the need for reliable observation, and stronger theories of classroom settings/contexts.

21st Century Learning

Two important facts are important to bear in mind as researchers and practitioners continue to grapple with the purposes and goals of American Pk-12 schooling in the 21st century (e.g., Darling-Hammond, 2010; Rueda, 2013; Wagner, 2008). First, student demography is shifting toward a non-white majority. Already the case in California, New Mexico, and Texas, demographers project a non-white student majority nationwide within a couple decades (Hernandez, Denton, & Macartney, 2007). Second, the competencies demanded by employers and civic participation alike in the 21st century are expanding to include capabilities that are *intra-* and *inter-personal* in nature (Jensen, Under Review; NRC, 2012). Whereas *cognitive* skills like reading, writing, computation, and information processing are required at more complex levels than in the past (e.g., Carnegie, 2010); social (e.g., collaboration, adaptability, oral communication) and conative (e.g., self-regulation, self-efficacy) competencies are increasingly in demand (Wagner, 2008). This is because the sought-after innovations in government, business, and technology tend to be best nurtured in environments ripe in imagination, creativity, horizontal leadership, and purposeful group work (Murnane & Levy, 1996; Surowiecki, 2005).

REM Underperformance

A major challenge (and opportunity) for researchers and educators, therefore, is to find ways to meet 21st-century demands for a large and rapidly growing population of racial and ethnic minority (REM) students with a teacher workforce that is currently more than four-fifths white, non-Hispanic (U.S. Dept. of Education, 2009). Meeting the challenge means unpacking the varied explanatory factors for the pervasive REM underperformance (Lee, 2002) and designing curricula and instruction to address these factors.

Currently, the academic underperformance of racial and ethnic minority (REM) students in the US—including Blacks, Hispanics, Native Americans, Pacific Islander, and some Asian groups (Lee, 2002; Pang, Han & Pang, 2011)—is better documented than it is understood. Many REM students continue to perform lower in reading, writing, math, and other areas than their white, non-Hispanic peers. And racial/ethnic differences persist beyond the effects of socioeconomic status (Galindo, 2013; Miller, 1997, pp. 143-159). Whereas parent education, family income, occupation status, and associated factors account for a substantive portion of REM underperformance, studies demonstrate performance gaps above and beyond socioeconomic effects (Reardon & Galindo, 2009). For example, analyzing data from the Early Childhood Longitudinal Study, Kindergarten Cohort (ECLS-K), Galindo (2013) found persistent math performance gaps (.36 to .65 SD) between middle-class Mexican-American and White, non-Hispanic students from kindergarten through fifth grade.

REM Developmental Assets

At the same time, studies in educational anthropology and developmental psychology identify a series of social and emotional assets nurtured in the out-of-school environments of many REM students. Research demonstrates childrearing practices in Mexican-origin families, for example, to be rooted in cultural values of respect for authority, hard work, and group solidarity (Bridges et al., 2012; Livas Stein, Garcia Coll, & Huq, 2013; Reese, 2013; Reese, Balzano, Gallimore & Goldenberg, 1995). These values tend to translate into strong development

for children, especially interpersonal competencies like cooperation and communication, as well as intrapersonal abilities like self-beliefs and a robust work ethic (Fuller & Garcia Coll, 2010; Knight & Carlo, 2012).

Researchers refer to the poor academic performance and relatively strong socioemotional competence of REM students as a "developmental paradox" (Fuller & Garcia Coll, 2010) because in mainstream society children demonstrating stronger cognitive skills also tend to demonstrate stronger socioemotional competencies. Some argue for building on REM children's intrapersonal and interpersonal strengths as a way of enhancing their cognitive and academic competence (Galindo & Fuller, 2010; Jensen, 2013; Jensen et al., Under Review; Reese, Jensen & Ramirez, 2014). This recommendation underscores the idea that complex academic tasks like problem solving and critical thinking demand a combination of social, emotional, and cognitive skills.

Classroom Culture

Many have argued that classrooms should build on REM students' socioemotional competencies to improve their academic performance (Crosnoe, 2006; DiPerna, Volpe & Elliott, 2005; Galindo & Fuller, 2010; Livas Stein, Garcia Coll & Huq, 2013), but little evidence demonstrates how. "Culturally responsive" classrooms for REM students propose useful approaches and offer claims, yet have not demonstrated evidence of narrowing performance gaps.

Sociocultural Learning Theory

Whereas there is no unitary theory of sociocultural learning, we situate our central arguments for greater specificity in the design of classroom improvement for REM students within the theoretical tradition of Vygotsky, Luria, and Leont'ev. Their work and corollary extensions accentuate inseparable relationships between human thought, action, and identity (John-Steiner & Mahn, 1996; Palincsar, 1998). Indeed, socioculturalists define human learning in terms of change in what the person knows and does, as well as changes in the *knower* herself (i.e., identity—"who I am"). Packer and Goicoechea (2000) make the case that sociocultural learning is marked not only by epistemological assumptions (*what* is known) but also ontological assumptions (*who* is the knower) of the world. Perhaps Dewey (1916) said it best when he described "the mind *with* the self" (p. 293, italics added). Learning, from the sociocultural perspective, comprises community practices carried out in various settings (Lave & Wenger, 1998). It builds on prior cultural knowledge and experience (Cobb & Yackel, 1996).

Importantly, "culture" from this perspective should not be thought of as a series of "individual traits", but rather as "community practices" associated with children's daily routines (Gutierrez & Rogoff, 2003, pp. 20-21). Culture does not consist of a fixed and static set of rituals, beliefs, and traits; to conceptualize students' culture this way runs the risk of reinforcing simplistic group stereotypes (Irizarry, 2007; Reese, 2013). This way culture is not synonymous with race, ethnicity, social class or any other group label. We view culture as both produced and reproduced in daily interactions within diverse settings, rather than necessarily a function of group difference. This conception allows for changes in culture over time and for within-group variation, in response to changing conditions (Nasir & Hand, 2006).

Social interactions—i.e., the behaviors or actions that occur between two or more persons in response to one another—are a central analytic unit in sociocultural theory (Vygotsky, 1978, pp. 24-30). Culturally bound rules, norms, values, and expectations shape how we relate, communicate, question, assist, and generally engage with one another. Sociocultural interactions underlie our learning and development. Indeed, according to Vygotsky (1978), differences between a child's "actual developmental level as determined by independent problem solving" and her potential level are "determined through problem solving under adult guidance or in collaboration with more capable peers" (Vygotsky, 1978, p. 86). We learn through prompts, clues, modeling, conversation, observation, imitation, joint participation, encouragement, etc.

Culturally Responsive Teaching

Literature on "culturally responsive pedagogy"—connecting student knowledge and experience from non-school to classroom settings (Bowers & Flinders, 1990; Gay, 2000; Irizarry, 2007; Stuart & Volk, 2002; Wortham & Contreras, 2002)—builds loosely on sociocultural learning theory. It also draws on a social justice (Brown-Jessy & Cooper, 2011) and socioaffective (Ladson-Billings, 1995) frameworks. Culturally responsive teaching includes explicit (e.g., content personalization) and implicit (e.g., social motivations) efforts to connect students' out-of-school lives with classroom experiences.

Culturally responsive pedagogy is more than generic attributes of "good teaching" (Ladson-Billings, 1995). It is important, thus, to distinguish universal (or global) from cultural (or local) dimensions of classroom interactions (Tharp, 1989). Global dimensions demonstrate positive effects on student development and learning in general, whereas local dimensions tend to favor some students' over others within the same classroom. Typically the curricular content and forms of social interaction in school settings favor White and middle to

upper-middle class children over underperforming REM students. Thus the culture of classroom learning is hypothesized to be more "responsive" for the already privileged than for REM students.

Two issues undermine the uptake and influence of culturally responsive practices in REM classrooms. First, little inferential evidence exists to demonstrate how—i.e., casual pathways—they influence student academic learning (Goldenberg, Rueda & August, 2006). Most research on culturally responsive teaching—and sociocultural studies in classrooms more generally—are interpretive and non-interventionist. Without associating sociocultural practices with student learning, however operationalized, it is difficult to ascertain instructional principles that could be replicated and tested in across classroom settings. Second, there is a lot of jargon and term confusion in the literature on culturally responsive teaching and related sociocultural studies. Semantic deviations can undermine a knowledge base for subsequent study and improvement.

Global and Local Dimensions of Classroom Interactions

A significant hurdle to expand the knowledge base on culturally responsive teaching is to disentangle the cultural (or local) from universal (or global) nature of classroom interactions (i.e., what Tharp [1989] termed "psychocultural variables" and "constants", respectively). These distinctions are necessary to understand how to fit academic content with REM students' out-of-school knowledge and experiences. One of the problems with sociocultural research in education generally is the ambiguity between quality (i.e., universal action for all students) and cultural practices that inadvertently privilege certain students over others (Goldenberg & Gallimore, 1989). Literature on culturally responsive pedagogy (e.g., Bowers & Flinders, 1990; Gay, 2000; Ladson-Billings, 1995) often presents local dimensions of classroom quality as different from or somehow indifferent to global dimensions.

Colleagues and I have argued that what is needed is a clearer articulation of how local dimensions are *instantiated* by global dimensions of classroom interactions (Reese, Jensen & Ramirez, 2014). In general, global dimensions address *whether* and to *what extent* quality interactions occur to spur student learning. Global dimensions include affective quality of teacher-student interactions, classroom management, and generic features (e.g., feedback, scaffolding, analytic discussion) of cognitive support during classroom instruction (Hamre & Pianta, 2001, 2005). Local dimensions address *how* that same interaction is socialized to draw on students' previous knowledge, experience, routines, values, and traditions.

We make three points to elucidate differences between global and local dimensions of classroom interactions (Jensen et al., Under Review). Each highlights the centrality of classroom context to make appropriate distinctions. First, the global vs. local nature of classroom interactions depends on the complexity (e.g., memory vs. inference) of learning objectives. Cooperation (a local dimension below), for example, can be considered a feature of global quality when teaching complex scientific concepts (Sinatra & Chinn, 2011).

Second, dimensions of classroom interactions can be considered local in terms of the differential degree of their influence (to student learning and development). Some work has found nurturing student choice and autonomy in classroom discussion to be associated with stronger language and reading gains for native Hawaiian children than for white, middle-class students in the same classrooms (Au & Mason, 1981).

Third, dimensions of classroom interactions are considered "local" in terms of setting differences that are functionally qualitative. That is, meaning from social interactions is made not exclusively in terms of "the extent to which" classrooms help students make personal connections through culturally responsive practice, but also "how" practices are contextually enacted—i.e., qualitative differences in how teachers motivate and socialize children. These differences are analytically inductive rather than deductive and have significant implications for designing culturally responsive environments. Thus we assert that classroom dimensions considered "local" are contextual and should incorporate qualitative information for valid interpretation.

Our contention is that the amalgamation of local and global dimensions of classroom interactions matters to relevant learning for REM students. Classrooms deemed "high quality" are not necessarily responsive, and vice versa. Whereas REM students can certainly gain understanding of academic content through universal quality alone, understanding is enhanced and intrinsic value for academic learning are greatly increased, in theory, when classroom interactions are also responsive to students' out-of-school lives (Brophy, 1999). On the other hand, classroom interactions that are highly responsive yet low in quality are characterized as maintaining some student interest but little academic learning.

Sociocultural Interactions in Classrooms

Shown in Figure 1, we identify ten "local" dimensions of sociocultural interactions in Pk-6 classroom settings, and organize them into three abstract domains: Life Applications, Self in Group, and Agency. We draw these constructs from a variety of fields, including cultural psychology, educational anthropology, developmental psychology, social psychology, sociolinguistics, communication, and multicultural education. The constructs themselves are not new, but the way we organize them into a single model sets the stage for a host of activities to design more relevant learning opportunities for underperforming REM students. Described at length below, our model provides a common schematic and nomenclature.

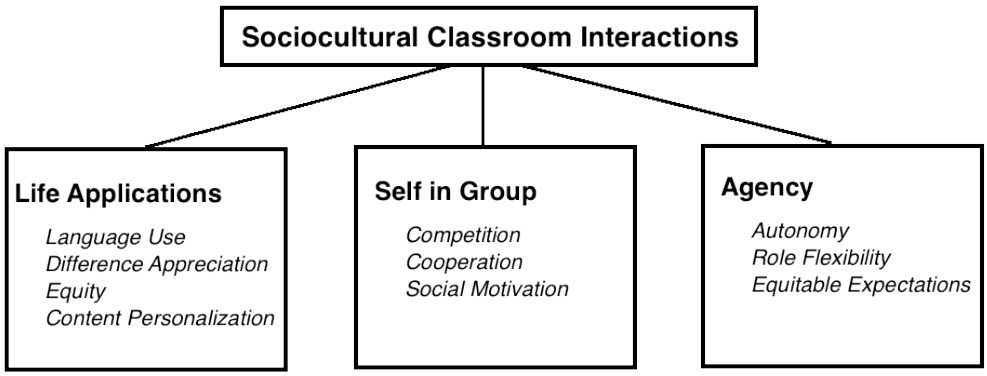

Figure 1. Model of sociocultural interactions in classroom settings

We established a priori criteria to construct inclusion for the model. Namely, we were interested in capturing constructs that a) have received attention in the research literature, b) are at least purported to be associated with children's socioemotional and/or cognitive development, c) are detectable to the trained observer, d) are commonplace enough to be observed within most hour-long classroom observations, and e) demonstrate malleability for subsequent improvement.

Life Applications

The first domain addresses whether and how classroom interactions explore and value students' interests, beliefs, knowledge, and experiences in order to make personal connections with classroom content (Aguirre, 1988; Cazden, 2001; Gee, 2001; Gonzalez, Moll & Amanti, 2005; Wertsch & Toma, 1995). Interactions are scaled on a continuum from "disconnected" to "well connected." Teachers in "well connected" classrooms demonstrate commitment to learn about students' lives, and they search for ways to incorporate what they learn. Dimensions include: Language Use, Difference Appreciation, Equity, and Content Personalization.

Language Use refers to the extent to which classroom interactions gauge and incorporate the natal, non-school languages (varieties or systems) of students to enhance content understanding and social relations (Heath, 1983). *Varieties* refer to the organization of language (e.g., style, structure, tone, vernacular) whereas *language system* refers to the actual language code (e.g., Portuguese, Korean, Spanish). Connecting classroom learning objectives with student language repertoires requires teachers to "code-switch" (Aguirre, 1988; Gumperz, 1982; Hakuta & Garcia, 1989; Valdes-Fallis, 1978) between the school and the non-school languages. Switching can be relational (Garcia, 2005, pp. 27-29) and instructional (Cazden, 2001).

Difference Appreciation refers to the extent to which teachers and peers value and address the diverse experiences, knowledge, beliefs, and interests of students in the classroom. "Well-connected" classrooms frequently discuss the out-of-school hobbies, activities, social roles, responsibilities, traditions, and peer and family relationships of children. This way, students learn more about one another, thereby developing their "cultural competence" (Ladson-Billings, 1995, pp. 160-161). They become more aware of their classmates' differences, and appreciate them rather than overlook, dismiss, or look down on them.

Equity addresses how classroom interactions address societal injustices (past and present) associated with student differences. "Well-connected" classroom interactions in terms of Equity develop teacher and student consciousness of past and present prejudice and discrimination—real or perceived—in order to imagine social transformations (Freire, 1970). Equitable classroom interactions promote social justice and, according to Ogbu (1987, 1992), are especially important for "involuntary" minorities—i.e., descendants of groups of persons thrust into a new society "against their will" (Ogbu & Simons, 1998, p. 165)—who identify with historical oppression (e.g., African American slavery, Native American subjugation).

Content Personalization refers the connections made between students' lives—routines, perspectives, social relationships, expertise, values, and traditions—and classroom learning objectives. Tharp and colleagues (2000) refer to Content Personalization as "making meaning" (p. 26-29). They argue that children "are willing to struggle with […] abstract notions in science, math, and other content areas when they are motivated by […] activities they and their families value" (p. 26). To do so, teachers orchestrate classroom interactions that "are situated in problems and issues of students' everyday lives [and] provide vivid opportunities [for] students to stretch their informal understandings to more abstract levels" (p. 26).

Self in Group

Self in Group, or "self-construal" (Kim, 2002), refers to how classroom interactions socialize students to relate to and work with one another to motivate learning and establish identities (Au & Mason, 1981; Greenfield,

1994). Do classroom conversations, for example, nurture a communal climate where team success is more significant than individual performance (Kim et al., 1996), or a setting in which the learning and achievement of students are at odds with one another? We scale scores dimensions of this domain from "independent" to "interdependent." Three dimensions of Self in Group include Competition, Cooperation, and Social Motivation.

Competition refers to the extent to which student success in the classroom depends on the failure of another (individuals or groups). In competitive classrooms, students strive to perform well simply to outperform their peers. Doing well in relation to one's peers is more important than understanding content (McInerney, Roche, McInerney & Marsh, 1997). Competitive classroom interactions are scaled as "independent."

Cooperation is defined as collaborative student effort to achieve a shared objective. Shared work, common goals, and social cohesion are indicators of Cooperation. Extant research on "cooperative learning" (Slavin, 2010) has found increased student learning outcomes, though some students benefit more than others (Stevens & Slavin, 1995). Webb & Farivar (1994), for example, found that Latino and African American middle school students demonstrated greater mathematics gains and classroom participation from academic skill training in cooperative groups than their white, non-Hispanic peers. Depending on the cultural norms and community practices, students may require close scaffolding to foster the pro-social skills (e.g., listening, turn-taking, assertion) required to cooperate.

Social Motivation refers to how classroom interactions incentivize student effort and participation. Are motivations oriented toward independent or interdependent effort and accomplishment? The idea is that social interactions and interpersonal relationships are inherently motivating for student engagement and learning (Martin & Dowson, 2009). But some rewards are more authentic than others, and cultural values across communities vary with regard to social cohesion.

Agency

The last domain refers to how student choice and freedom are managed (Holland et al., 1998). It addresses how active the classroom environment allows students to be—to exercise choice, undertake responsibility, take on different social roles, and internalize learning expectations. This domain is concerned with who makes the instructional, curricular, and organizational decisions in the classroom and how those decisions are enacted. Agency dimensions include Autonomy, Role Flexibility, and Equitable Expectations, scaled from "not distributed" to "well distributed."

Autonomy addresses how much choice children are granted to select materials and tasks, monitor their learning progress, collaborate with peers, engage in relevant conversation, etc. It refers to an "internal perceived locus of causality" (deCharms, 1968). It does *not* refer to any ideal toward group activity (Chirkov, Ryan, Kim & Kaplan, 2003), though Western perspectives often associate autonomy with independence (Deci & Ryan, 2008). Autonomy, however, "refers not to being independent, detached, or selfish but rather to the feeling of volition than can accompany any act, whether […] collectivist or individualist" (Ryan & Deci, 2000, p. 74).

Role Flexibility refers to how rigid or malleable roles are between experts (e.g., teachers) and novices (e.g., students) to complete a task. Cultural psychologists find role flexibility to vary across communities (Paradise & Rogoff, 2009; Rogoff et al., 2007). In some communities, roles are rigid—divided and assigned by the expert. In others, roles are more fluid: though with limited experience, the novice attempts to complete a task with guidance from the expert (Rogoff, 1990). "Distributed" agency is associated with flexible roles.

Equitable Expectations are defined as the enacted beliefs that teachers have about their students' learning aptitude in the classroom. These beliefs—developed and communicated mostly through subtle, indirect, and ongoing interactions (Good & Brophy, 2008, pp. 54-57)—are associated with the distribution of student agency. That is, teachers with equitable expectations induce autonomy for *all* students through complex tasks, opportunities for self-evaluation, individualized feedback, and shared respect (Good & Weinstein, 1986).

A Stronger Sociocultural Design Science

We encourage further study to apply attributes of design research (van den Akker et al., 2006) to study (and improve) these sociocultural dimensions in classroom settings. Design research provides opportunities not only for establishing a broader base of empirical evidence regarding the influence of Life Applications, Self in Group, and Agency in classrooms, but also information on when these features matter, for whom, and for what purposes. It does so by focusing on contextualized problems of practice through iterative study, cultivating close collaborations between practitioners and researchers, blending multiple research methods as needed, and providing "fine-grained" (diSessa & Cobb, 2004, p. 89) theoretical advances.

Two major advances are needed in the field to establish a stronger design science on associations between REM learning and sociocultural interactions in classroom settings. First, we need a reliable observational system to capture "local" dimensions of classroom quality. This system should demonstrate internal consistency, face and construct validity, a strong, interpretable factor structure. This task is certainly daunting, as it requires capturing historically interpretivist constructs within a psychometric paradigm.

Thoughtful efforts should capture context-sensitive markers for the dimensions described, yet clear enough scoring rubrics for raters to reliably observe them across diverse classroom settings and cultural traditions.

Second, by extension, stronger conceptions of classroom contexts associated with "cultural responsive" practice are needed (i.e., ecological validity). Whereas research findings associating sociocultural interactions and REM student learning would generalize at the classroom or setting level, we need stronger schematics of context attributes (i.e., covariates) that matter to these relationships. Said schematics are likely to include attributes of the academic task (e.g., developmental demand, artifacts/tools), timing (e.g., duration, time of day, day of week), rules (e.g., participation structure, values) and, of course, participants—fixed qualities like race, age, and gender, as well as malleable qualities like identity, beliefs, and dispositions. To add further complexity, setting attributes of the classrooms are necessarily interwoven with characteristics at the intuitional (programs, policies, dominant beliefs) and community (socioeconomic status, racial/ethnic integration) levels that constrain and afford culturally responsive practice (Cobb, McClain, de Silvia Lamberg & Dean, 2003).

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