Standardized Academic Testing and Culture: A White Paper

R. Sprehn, Doctoral Student
July, 2004
University of Maryland College Park

Introduction

        Current standardized testing practices fall short of providing valid results for the culturally diverse student bodies they are intended to measure. A recognized, although under addressed, part of this problem is the issue of culture. In standardized testing various cultures come together—that of the test developer and those of the students being tested. A single test format, therefore, puts students with cultural backgrounds different from the test developers at a disadvantage, and, thus becomes an inaccurate measure of knowledge across the intersection of cultures. Educational researchers have pointed out this problem of culture in standardized testing (e.g. Farr and Trumbull 1997; Pellegrino, Chudowsky and Glaser 2001) and a National Science Foundation study, "Assessing the Cultural Validity of Science and Mathematics Assessments," is investigating methods and sociocultural theory to address it (see Solano-Flores and Nelson-Barber 2001; Solano-Flores 2002; and Solano-Flores and Trumbull 2003).

        Given the changes in the U.S. population in the past decade, addressing culture in the classroom is a timely endeavor. Cultural diversity has characterized our nation's school systems for a long time but only recently has this diversity increased at a rapid rate and also been widely acknowledged. The U.S. Census Bureau specifically refers to population diversity in the U.S. 2000 when they provided an option for people to select more than one racial category (Brewer and Suchan 2001). Although the census acknowledges that racial categories include many cultural groups, they also use this information to obliquely refer to cultural diversity. The U.S. Census Bureau states, "A school system might use information on race and Hispanic origin to design cultural activities that reflect diversity in the community (U.S. Census Bureau 2002:16-1)." Acknowledgement of cultural, racial, and ethnic diversity comes, in part, as the number of people from non-dominant cultural groups rises at a rapid rate. Population diversity has increased, in part, due to changes in immigration laws between 1965 and 1990 (U.S. Census Bureau 2002). In 1970, the foreign-born population in the U.S. was 10 million compared to an estimated 28 million in 2000 (U.S. Census Bureau 2002). The Hispanic[1] population increased 57.9 percent between 1990 and 2000 (Guzmán 2001:2).

        This paper looks at the problem of standardized testing and culture from the anthropological perspective. The aim is not to present a framework to radically change current classroom testing but only to improve what currently exists by addressing the impact of culture. This paper discusses the concept of culture in education, why culture

---

[1] Hispanic refers to people of any race whose origins are from Mexico, Puerto Rico, Cuba, Central American, South America, Spain, or any other Hispanic origin (U.S. Census Bureau 2001b:1). Hispanic refers to the cultural linkages to Spain which began in fifteenth century explorations of the world.

should be and how it has been incorporated into academic testing practices, why misunderstanding culture contributes to inaccurate test results, suggestions for improving testing across classrooms, and research directions for improving the validity of standardized tests by incorporating cultural concepts.

The Concept of Culture

The word culture has many definitions. The anthropological definition falls in sixth place in the Random House Dictionary (1987): culture is "…6. *Anthropol*. the sum total of ways of living built up by a group of human beings and transmitted from one generation to another." It is an extremely broad and complex concept that anthropologists have grappled with since the beginnings of the discipline and continue to do so today. In 1871 the anthropologist Edward Tylor published *Primitive Culture* where in the first few lines he defined culture in a way it is still used today: culture "…is that complex whole which includes knowledge, belief, art, morals, law, custom and any other capabilities and habits acquired by man as a member of society." In 1920 Franz Boas further delineated the concept of culture by pointing out that it is learned not biologically determined and that cultural traits cannot be universally classified, that is to say each culture has its unique set of interrelated traits (Boas 1920). In 1952 anthropologists Alfred Kroeber and Clyde Kluckhohn provided more than 200 definitions of culture (Kroeber and Kluckhohn 1952).

Today the use of term culture is complicated by globalization where the patterns of *that complex whole* are blurred by an accelerating pace of change brought on by the rapid transmission of people, capital, goods, and ideas across political boundaries (Mintz 2000). In addition, the popularization of the word culture further obfuscates its meaning and in the process simplifies it "…to describe just about everything" (Mintz 2000:177). The challenge of defining and recognizing the impact of culture in the classroom has also been addressed in educational research (Eisenhart 2001). The difficulty with addressing the cultures of students in the classroom stems from vague and porous cultural boundaries. The cultural influences on students are less defined by household and community than in the past as students engage more and more in the complex network of information brought on by technology and migration. Eisenhart writes that today "…everyday life, including life in schools, seems to be faster paced, more diverse, more complicated, more entangled than before. The kinds of personal and social relationships, exchanges, and networks we participate in seem to be taking new forms, tying together otherwise disparate people, and demanding some new ways of thinking about what to research and how to do it (2001:24)."

It is more useful to discuss the concepts that define culture rather than state a specific definition of culture that because of its complexity would be either too broad or too specific to use at a practical level. Incorporating culture in education involves understanding the student and the world around her. This understanding involves the interface between anthropological and psychological theories. While anthropology focuses on how culture and society work, psychology focuses on how a person perceives and processes culture and society.

The anthropological and sociological theories of Pierre Bourdieu provide a framework for understanding culture in education by specifically addressing the bridge between the structures of society and the behavior of individuals. Bourdieu focused much of his studies on education with the intention that his theories to be workable in the real

world (Grenfell and James 1998). Boudieu's perspective accounts for the structural nature of culture and society but also emphasizes the ability of individual acts to affect the structures of culture and society (Bourdieu and Passeron 1990; Bourdieu 2003). In his perspective on culture individual people have agency, i.e. the capacity for exerting power, and with this agency they reproduce the learned structures and patterns that make up culture. Because people reproduce but not necessarily repeat what they have learned, structures are open to change. So culture is reproduced as it is passed from generation to generation but it is also changeable.

Psychological theories of learning provide a framework for understanding how people perceive and acquire culture. The theories of Soviet-trained psychologist Lev Semyonovich Vygotsky (1896-1934) have influenced classroom learning in Europe, Russia, and the United States (Kozulin, Gindis, Ageyev, and Miller 2003:1). Vygotsky recognized the dynamic quality of individual development as well as society and culture and contributed to educational research the understanding that culture influences what and how students learn (Vygotsky 1978). Vygotsky's perspective views culture and society as driving forces in individual perception and understanding (Vygotsky 1978). Psychological tools, such as literacy, link individuals to broader sphere of society and culture (Vygotsky 1978).

Reuven Feuerstein, an Israeli psychologist, provides contemporary and complementary theories on learning. Essential to Feuerstein's theories of learning is that human minds have the ability to change and grow[2]. In line with this reasoning, his approach to evaluating students is dynamic, i.e. cognitive ability is tested by asking what student <u>can</u> learn rather than what they <u>have</u> learned. Feuerstein's theories were initiated in his early work with a culturally diverse group of immigrant children with widely disparate educational backgrounds from Asia, Africa, and Europe. His job involved testing these children to place them in appropriate educational settings in Israel. Many of his observations are relevant to understanding culture at the individual and family levels His fundamental concept in learning is the *mediated learning experience* (Feuerstein 1980). *Mediated learning experience* refers to the idea that children learn to understand and interpret the world via the mediation of parents, siblings, or other caregivers. This concept explains one of the crucial aspects of culture and that is that culture is reproduced at the level of the individual. The concept of *mediated learning experience* rests on the intergenerational link that generates cultural continuity. The mediating person(s) in a child's life organize(s) and elaborate(s) the surrounding world—a process that facilitates the child's ability to use these learned mental processes as she grows.

For the purposes of the issue of cultural differences in learning and academic assessments, I highlight several points about culture. People learn culture and are the reproducers of culture. They reproduce the behaviors, attitudes, and expectations that they have learned. The reproduction of culture involves the mediation by one generation to the next of all that makes-up culture. Throughout the mediation, a person's experiences, background, and personality bring different dimensions to the reproduction of culture. It must be kept in mind, however, that on the other hand, culture also structures what people learn and how they behave. Feuerstein (1980:3) aptly states:

> Because of the social and cultural discontinuity that marks today's society, the
> individual can no longer rely on an established order or traditional patterns of

---

[2] See Feuerstein's concept of cognitive modifiability (1980:9-11)

behavior. Greater social, political, economic, and religious freedoms place a
heavy burden of responsibility on the individual. Decisions must be made
concerning employment, use of leisure time, political and religious affiliations,
morality – in short, individual destiny is today, more than ever before, in the
hands of the individual himself. Without the necessary cognitive tools, the
individual cannot carve a future that will enable realization of his potential for
growth.

Culture and Education

Culture is tied to education in that it is through education that much of culture is
transmitted, making education a cultural mechanism (Bourdieu 2003).The broadness and
complexity of the concept of culture contributes to the difficulty of using it in a
methodologically sound manner in the classroom and in educational research. Cultural
codes include subtle traits and ways of communicating that often go unrecognized by
people of other cultures. What may be a cultural trait of one person is not to another or
something that is cultural is not perceived as such and thus cannot be addressed as a
possible barrier in learning or in assessment. Thus, understanding the role of culture in
education is crucial to providing a fair and comfortable learning environment. The
anthropological study of children, their language, culture, and social world lags behind
studies focusing on adults and adult-child relationships (Harness Goodwin 1997). A
notable interest in children and schooling occurred in the 1970s (e.g. see the 16 book
series on the ethnography of schools, "Case Studies in Education" published by Holt,
Rinehart and Winston). Despite the relative paucity of research on children, studies have
clearly shown that culture influences what and when children learn and how they learn it
(e.g. Heath 1982, 1996; Tharp 1994; Tobin, Wu, and Davidson 1989; Wang, Bernas, and
Eberhard 2002; Ward 1971; Weisner 2001).

With regard to education, there are two significant cultural distinctions that of the
home and that of school. This distinction was pointed out by researchers addressing low
academic achievement of students from non-dominant groups (e.g. Ramirez and
Castenada 1974 and Philips 1972). The culture of the home may be congruent to that of
the surrounding community, e.g. American Indian reservations and immigrant
communities (see Grimes 1998 for an example of a Mexican community in Atlantic City)
or it may be distinct as in the case of a family immigrating to a mainstream U.S.
community. Although cultural influences are not limited to home and school, particularly
in today's globalized world with internet and easy modes of travel, they are the most
prominent.

Students experience the home culture before beginning school. In the home, much
of what children learn of culture comes from their mothers. For biological as well as
social reasons, mothers are commonly the primary cultural mediators of children. This
process is apparent in families whose parents are culturally distinct. In the Sierra
Tarahumara region of northern Mexico, the pattern in families with Tarahumara mothers
and mestizo[3] fathers is that the children are culturally Tarahumara[4]. They speak
Tarahumara and adhere to Tarahumara cultural norms. In contrast, the pattern in families

_____

[3] Mestizo refers to people who are of mixed Spanish and indigenous ancestry whose culture is non-
indigenous.
[4] The ethnographer, William Merrill of the Smithsonian Institution, pointed out this phenomenon that once
identified is so clearly apparent.

with mestizo mothers and Tarahumara fathers is that the children are culturally mestizo and do not speak Tarahumara nor adhere to Tarahumara cultural norms.

Reay's (1998) study of mothers' involvement in their children's primary schooling addresses those characteristics of culture stated above. Mothers tend to be the primary supporters of their children's education. They become the connections between home and school varying in their involvement in, for example, homework, PTA, and advocating for their child's needs. In supporting their children women draw on their own knowledge and experiences in education. Because schooling changes through time as social values change and immigrant children attend different schools from their mothers, the culture experienced by primary school students becomes a combination of what they learn from their mothers and what they learn in school—a process that results in continuities and discontinues and a reflection of the dynamic nature of culture.

The influence of the home culture continues throughout students' schooling. Students whose home culture is more similar to that of school will have a pedagogic advantage over those students whose home culture is distinct (Grenfell and James 1998:164-165). The dominant culture of U.S. schools is that of mostly Anglo, middle- and upper-classes. "Children from middle-class homes tend to do better in school than those from non-middle-class homes because the culture of the school is based on the culture of the upper and middle classes – of those in power (Delpit 1988:282)."

Studies have shown how students with cultural backgrounds that are distinct from their teachers are placed at a disadvantage. Many studies have focused on the cultural differences within the U.S., particularly of American Indian and African American cultures. Erickson and Mohatt (1982) in their study of American Indian education discuss how the lack of recognition by non-Indian teachers of cultural characteristics penalizes students. For example, some teachers identified students as poor learners based on behaviors such as avoiding direct commands and deflecting attention from themselves, when in fact these behaviors and attitudes are culturally appropriate for them. The presence of mainstream U.S. goods such as cars and clothing as well as fluency in English on Indian Reservations contributed to outsiders' lack of recognition of cultural differences in social behavior. Unfortunately, this problem stems in part from the teacher education courses that teach culture is "…formal, explicit patterning, primarily producing artifacts and languages" meaning that culture is limited to those explicit markers of culture such as traditional arts, food, and language (Erickson and Mohatt 1982:167). Yazzie (2002) also discusses the problems of unrecognized cultural traits in teaching American Indian students. Teachers unaware that ways of thinking and behaving are often culturally patterned may not acknowledge American Indian culture beyond the obvious including holidays, food, and culture heroes. Delpit (1988) highlights how unrecognized cultural differences between white teachers and black students results in labeling some black students as behavior problems when in reality the students are not comprehending the cultural codes or implicit meanings of teachers' behavior and language. In contrast, children who grow up in white middle-class and upper-class homes are at a definite advantage because they already understand the cultural codes of the classroom.

Numerous cultural contrasts characterize learning. Major learning differences among cultures are found in means of communication, particularly in the child and adult interaction. [See Ochs and Schieffelin (1994:476) for psychological studies of language

that show this.] "All normal children will become members of their own social group, but the process of becoming social, including becoming a language user, is culturally constructed. In relation to this process on construction, every society has its own developmental stories that are rooted in social organization (Ochs and Schieffelin 1994)." Learning language involves more than acquiring vocabulary and understanding grammar, it involves incorporating a worldview (Ochs and Schieffelin 1994). In an ethnographic comparison among U.S. white middle class, Papua New Guinea, and Samoan mothers and their children, Ochs and Schiefflin (1994) show how the patterns of early language use are consistent with the cultural patterns of adult language. Most white middle class language interaction is between two individuals and communication with babies follows this pattern in that the primary relationship is with the mother. In contrast, Kaluli mothers in Papua New Guinea construct language interactions that involve more than two people and are often focused away from the mother—a pattern that becomes very important in adult interactions where status and rank become very important in language use and social contexts. "What caregivers say and how they interact with young children are motivated in part by concerns and beliefs held by many members of the local community (Ochs and Schiefflin 1994:496)." For example, Kaluli mothers do not make direct eye contact with their infants because this behavior in the adult world is associated with witchcraft. In white, middle-class U.S. society, infants are considered social beings able to express intentions and participate in conversations—a perspective that is not held by all cultures (Ochs and Schiefflin 1994:496).

Learning culture as well as learning how to learn begins at birth. This is particularly apparent in studies of language. Consequently when the home culture is not that taught in the school system, children are at a disadvantage. Discourse patterns or the ways ideas are verbally exchanged are cultural and learning them begins at home. In her 1971 study Martha Ward shows how the children of Rosepoint, Louisiana, communicate in an entirely different way with adults than what is expected of children in typical U.S. classrooms. This community identifies mainly with the black ex-slave culture of the South rather than the white ex-French culture of Louisiana (1971:12). As such when children begin school they encounter a cultural chasm. In contrast to the highly verbal way of learning in white middle class culture, Rosepoint children learn in many non-verbal ways. In fact, Ward's study shows how children are expected not to verbally interact with adults, particularly with strangers. When Rosepoint children begin to talk, adults begin to refer to them as 'bad' and bothersome (1971:29, 71, and 84.)

Heath (1982) compares the mother-child discourse patterns between white, middle-class teachers and black, working class women. She found several important differences in the questioning aspect of discourse. Adult discourse with children in the black community included far fewer questions and, like Ward found in Rosepoint, adults did not engage in direct conversation with children until they were old enough to provide information in a real conversation. In these two black communities there was a distinction between verbal and non-verbal children. Until children became verbally competent, adults made statements about the preverbal children to another verbal person, a sibling or other relative. For example, while a Trackton mother would say of a crying child, "Supm'n's the matter with that child," the white teacher would ask directly of the child, "What's the matter? (Heath 1982:114)." Also the expectations of questioning are shown to be quite different in the two cultures. The white, middle-class questioning teaches by

focusing on specifics, such as colors and numbers, while the black, working-class questioning teaches by focusing on contexts and the characteristics of persons, objects, and events (Heath 1982:120). Heath states, "Indeed, to Trackton children, their teachers asked foreign questions about foreign objects (1982:120."[5]

Cultural patterns are also noted in the focus of learning, which also begins in the pre-school years at home. Wang, Bernas, Eberhard's (2002) study shows the difference between Chinese and American Indian cultures with regard to literacy. Chinese mothers focused on print-based literacy and supported their children's learning in explicit, event-specific and elaborative ways. In contrast American Indian mothers focused on oral narratives and personal experiences and supported their children's learning in implicit and contextual ways.

Studies have shown how children in some cultures learn by watching without the constant verbal instruction and interaction with the person from whom they are learning typical of U.S. classrooms. Karen Swisher (1991) provides specific examples of this difference in learning style and in the manner in which children demonstrate progress in learning.

Another important category in ways of learning that reflect cultural attitudes is in the orientation of the learning. Is the individual or the group the focus? Trumbull, Rothstein-Fisch, and Greenfield (2000) summarize this difference. The focus on the individual characterizes U.S. middle class culture which encourages independence and individual achievement, self-expression, and personal choice. In contrast, a group focus encourages interdependence, group success, and agreement among its members. Ward's 1971 study shows the contrast between the cultures of home and school. In Rosepoint, people focus on community rather than individual achievement. Children learn this communal focus from the beginning. Teachers unaware of this difference in values may interpret children working together as cheating. Regarding cooperative versus competitive cultural values, Swisher and Deyhle (1989) quote a teacher's comment on her American Indian students:

> You put them out on the basketball court and they are
> competitive as can be. But in the classroom they don't want to
> compete against each other. I can ask a question and when a
> student responds incorrectly no other student will correct him.
> They don't want to look better than each other or to put another
> student down. The Anglo students are eager to show that they
> know the correct answer. They want to shine; the Indian students
> want to blend into the total class (Teacher, personal
> communication, 1988).

A study at the University of California, Berkeley, shows another pattern of cooperative versus independent behavior (Fullilove and Treisman 1990). This study addressed why Chinese American students outperformed their African American counterparts in math courses. In part they did because they worked cooperatively, exchanging information and correcting each others homework, a contrast to the African American students who worked independently and did not benefit from input and exchange from other students (Fullilove and Treisman 1990).

---

[5] See Lee 2002 for more references on culture and discourse.

The attitudes of non-dominant cultural groups towards schooling are also affected by historical factors (Ogbu 1978). The history of relations between American Indian and Alaska Native cultures and the U.S. government exemplifies this point (Trumbull Estrin and Nelson-Barber 1995). In 1868 the U.S. government began funding and controlling Navajo education. This drastic change to Navajo culture which can be characterized as the imposition of westernized institutions resulted in the alienation of Navajo parents from the schools (Emerson 1983). The ambivalence of American Indian and Alaska Native families in supporting the goals of public schools continues today (Trumbull Estrin and Nelson-Barber 1995).

This discussion is not meant to provide an exhaustive description of how cultures differ in what and how children learn. It is meant to show that culture does involve patterning in behaviors, values, and expectations. For example, common cultural learning patterns of American Indian and Alaska native students includes: a visual approach to tasks, preferring to learn by careful observation which precedes performance, and preferring to learn in natural settings experientially (Swisher and Deyhle 1989). We must keep in mind, however, that we are talking about individuals and that means that they may or may not fit the patterns described. One cannot assume that a child from a particular culture will adhere to the patterns that define that culture. Additionally these patterns are bounded by place and time. Children can learn the cultural codes of more than one culture, particularly when they are learning another language.

Culture changes through time in unpredictable ways. Consequently, understanding a group's culture must occur in the present. As mentioned previously, today's cultural influences on students stem not only from home and school but from a wide sphere of linkages. Pitman, Eisikovits, Lundy Dobbert (1989) point out "...the major forces 'shaping' children and young people in the process of culture acquisition are the same as those that shape or direct all learners, namely, the structures and processes of the entire sociocultural life going on around them." The extent of cultural sources widens as children get older spending a greater amount of time away from home and school environments. Eisenhart (2001) points to Shirley Brice Heath comments on this subject which she wrote in her 1996 Epilogue to *Ways With Words*. She compares the Black communities from the 1970s to the 1990s:

> Present day households and communities of children and youth lack the easily described boundaries of their parents…. In many households, weeks go by when no two members of a household eat at the same time, share any chore, or plan work together…. Youngest children are in daycare centers. School-aged children go inside friends' houses to watch television or play video games; they crowd into the vans of community youth athletic leagues and move from sport to sport by season…. Older youth … race to their cars … and head for fast-food restaurants or malls…. On they go, they listen to car radios or wear headphones and throb to the muffled beat of their compact discs or cassettes. (pp. 370-372)

Culture and Testing

The culture of the U.S. education system is predominantly that of mainstream and middle-class U.S. culture which has its roots in European-American history and values (Farr and Trumbull 1997). Consequently students from non-dominant cultural groups, regardless of whether they were born in the United States or in another country, are likely either not represented in test results or receive scores that do not reflect what they know

because of an inability to access what is being measured. The studies discussed above show how the impact of culture on learning cannot be overlooked by teachers and educational researchers and because learning in school involves evaluation, testing must also take into account cultural differences. In other words, culture, learning, and testing are inextricably linked (Cole 1999).

Differences in culture, including language, must be considered throughout the entire testing process including test type and purpose, test content, responses, and scoring. An important, yet often overlooked aspect of culture and testing is a child's experience with testing. The way schools test may be new to students. For example, structured testing is not customary in many American Indian communities (Swisher and Deyhle 1992). Studies have shown that within their communities American Indian children do not expect to be tested until they have mastered the task—a distinct cultural difference from the on-demand testing in the classroom (Swisher and Deyhle 1992). Attitudes and values towards testing often reflect cultural divisions. For example, American Indian parents and students often regard tests as unimportant, an attitude derived from the effects of taking tests developed in mainstream U.S. culture (Chavers and Locke 1989). Immigrant students may not understand the high value the U.S. schools place on testing. Overall, test results become invalid if students do not honestly attempt to show what they know (Trumbull Estrin and Nelson-Barber 1995).

The manner of testing is also culturally diverse. Children first learn the evaluative aspect of learning in the home. This aspect of learning often manifests in the discourse between adults and children. In some cultures, adults structure discourse with children in a question and answer format similar to the structure of a written test. In other cultures discourse occurs within a quite different format, thus, creating a hurdle for students unaccustomed to U.S. mainstream ways of testing. As Ward (1971:93) points out in Rosepoint, parents usually do not ask questions of their children when the answers are obvious. For example, when Ward, the ethnographer, prompted a mother to ask her child what he did during the day, his main response was, "Hunh?" This question was confusing to him because he knew that she was well aware of what he did during the day (Ward 1971:73). Discourse in many communities does not involve asking questions about something the asker already knows which is a pattern that contrasts with that in mainstream U.S. classrooms. Questioning children in many American Indian cultures is also incongruous with mainstream U.S. learning and discourse patterns (Swisher and Deyhle 1992).

The cultural expectations and values of test developers impact students' understanding of tests when they assume students have grown-up in the U.S. and share a common U.S. experience and assume a common U.S. value system (Kopriva 2000). The content of the test itself also poses problems for students with culturally diverse backgrounds. The implicit cultural elements at the item level of tests mean that tests may test more than what is taught which places students from different cultural backgrounds at a distinct disadvantage. Innumerable concepts are culturally bound. An example from Ward's study shows a difference between the culture of Rosepoint and mainstream U.S. (1971:93). In Rosepoint, children do not learn the four cardinal directions of north, south, east, and west, they learn directions relative to the river, "up the river," "down the river," "away from the river," and "to the river."

Cultural differences occur in the interpretation of items. In a comparative study of cultural groups from Micronesia, central Washington, and Alaska, Sexton and Solano-Flores (2002) show how different cultural backgrounds affected how students understood and solved math and science problems. In this study researchers categorized students problem solving of items into whether they used the information given in the item that relates to general academic skills, everyday life experiences, or formal school learning. Although most students interpreted items using the information given in the item (general academic skills), Latino students from Washington relied more on life experiences than the other two groups. This study shows how students will use different aspects of their cultural background in problem solving.

In addition to test development, test scoring requires cultural sensitivity. Researchers have specifically addressed the cultural issue with academic testing of English language learners (e.g. Kopriva 2000; Kopriva and Sexton 1999; Kopriva and Saez 1997; Solano-Flores 2003; Solano-Flores and Trumbull 2003; Solano-Flores, Trumbull, and Kwon 2003; and Solano-Flores, Trumbull and Barber 2002). With regard to open-ended math questions, scorers must keep in mind that mathematical symbols differ across writing systems (Kopriva and Saez 1997). For example, commas are used instead of periods, decimal points are placed higher (e.g. 5·5 versus 5.5), monetary systems are different, and symbols other than Arabic numerals are used. With regard to open-ended science questions, scorers should keep in mind that symbols, characters, markings, and accents vary across writing systems, the metric system is used, calendar dates are written in different formats, and writing patterns and styles vary, e.g. long versus abbreviated responses. (See Kopriva and Saez 1997:23 for a table of different language conventions).

Teachers and educational researchers need to address culture regardless of whether students are English speakers or not. When testing English language learners the issue of culture is more apparent although equally as complex as addressing cultural differences of non-mainstream, English speaking students. Speakers of different languages automatically signal exposure to an entirely different culture. It is important to keep in mind, however, that while language is a part of culture, a shared language does not mean a shared a culture. Language is culture's systematic means of communication. Language is learned, transmitted from generation to generation, and as an integral part of culture language also changes through time. For example, the Spanish speakers of North America, Mesoamerica, South America, and Spain can understand one another because one of the languages they speak originated in Spain and through the processes of history spread. However, these people compose a tapestry of distinct cultures. With regard to the classroom, a teacher or test giver cannot assume that because a student speaks Spanish and emigrated from Mexico that she is culturally mainstream Mexican. In fact, Spanish is likely the second language she has learned while the first one is one of the many indigenous languages spoken in Mexico.

Applying the Concept of Culture to Testing

Applying the concept of culture to testing is complicated by the changing nature of culture and the fact that a culture is defined by patterns. No person conforms to all the patterns that make-up his culture. While teachers and educational researchers can know what is typical of a culture they must be careful not to reinforce stereotypes based on group membership (Eisenhart 2001). Stereotyping students may penalize them instead of

helping them access test questions. Additionally, culturally categorizing students may jeopardize students by confirming negative stereotypes—a situation Steele and Aronson (1995) refer to as *stereotype threat*. Steele and Aronson's psychological research demonstrated the negative repercussions of *stereotype threat* in racial stereotypes of African Americans at the college level.

Additionally, any one culture must be acknowledged in its many forms. For example, an American Indian tribe has distinct cultural manifestations between rural and urban members. African American culture differs across the United States.

The ability of students with foreign cultural backgrounds to understand the cultural codes in U.S. schools varies. The combination of issues that affect a students' understanding of U.S. culture falls into four broad categories. One category are those students with good comprehension of U.S. culture and who have arrived in the U.S. recently but have had good exposure to U.S. culture through mass communications, Internet, and travel to the U.S. *World youth cultures* are a phenomenon brought on by the changes of globalization which geographically distant students share a cultural affiliation. Another category is students born in the U.S. or who have lived here for years may also have a good understanding of U.S. culture because they have been exposed to it for a long time. They will have at least two cultural identities generated from the cultures of their home and those outside. Those students with little understanding of U.S. culture and have just arrived in the U.S. and have had little contact with the influences of U.S. culture form another category. And finally, other students may have been in the U.S. for years or even born here but have been influenced mostly by their home culture which is the same as that of their community. The point is that using criteria such as years in the U.S. cannot discern a student's ability to understand the cultural codes of mainstream U.S.

Educators must also acknowledge that in addition to culture, personality is a pivotal factor in understanding what is best for students in learning. Personality traits should not be overshadowed by what characterizes a student's culture. Again, not one person will conform to all the patterns that make-up a culture.

Solutions

Despite the complexities of culture, teachers and researchers should realize it is possible to improve education by understanding culture's impact on how students learn and in how what they learn is measured. Recent research has emphasized the importance of cultural factors in general in the testing process from development through scoring (see Solano-Flores 2003; Solano-Flores and Trumbull 2003; Sexton and Solano-Flores 2002; and Solano-Flores and Nelson-Barber 2001). These researchers call for a paradigm shift in the way English language learners and non-mainstream students are tested. They propose the concept of *cultural validity* as a way to improve assessment validity in classroom and large-scale contexts. Cultural validity is the "...effectiveness with which [science] assessment addresses the sociocultural influences that shape student thinking and the ways in which students make sense of science items and respond to them. These sociocultural influences include the sets of values, beliefs, experiences, communication patterns, teaching and learning styles, and epistemologies inherent in the students' cultural backgrounds, and the socioeconomic conditions prevailing in their cultural groups (Solano-Flores and Nelson-Barber 2001:555)." Solano-Flores and his colleagues propose several ways for addressing cultural validity in testing. They advocate changes in test review and test development and recommend treating language as a source of

measurement error. Solano-Flores (2003) categorizes test design and review into the following dimensions: (1) formal properties (e.g. sentence complexity of items), (2) pragmatic (e.g. appropriateness of test for certain groups of students), (3) individual (e.g. how students interpret items); (4) differential (e.g. how groups of students from different socio-cultural contexts differ on their interpretations of the same item). The paradigm shift calls for using a multidisciplinary team including local educators to develop and review tests.

The proposed changes in test review involve micro-analyzing items for cultural validity. This review process examines how students understand test items. The properties of each item are evaluated against students' cultural background which encompasses language and socioeconomic factors. The review process involves pilot testing items with culturally diverse students who provide feedback on cultural validity.

Improved validity in testing English language learners can be achieved by using the concurrent assessment development model (Solano-Flores, Trumbull, and Nelson-Barber 2002). This model requires that two language versions of a test be developed simultaneously and then any modifications to one language version be done on the other. They also advocate using structural linguistics and graph theory in a formal approach to examining the linguistic features of items which tend to be unnecessarily complex (Solano-Flores, Trumbull, and Kwon 2003). Throughout the testing process language should be considered a source of error simply because English language learners perform better in English for some items and for other items better in their home language (Solano-Flores, Trumbull, and Kwon 2003:7).

The solution of creating different tests for different students based on what is known about students' backgrounds, which item microanalysis and the concurrent assessment models do, may be criticized. Items that are intended to measure the same construct will have differences in working and syntactic and discourse structures. Can these different items that are intended to measure the same constructs be considered equivalent. The process of creating different items for different students must be done with extreme consideration for keeping what is being measured constant.

Creating different items for different students brings up the issue of deciding what will provide the necessary information to allow a student to access an item without giving some students unfair advantages to providing solutions. Ultimately, as Solano-Flores (2003) concludes, it is difficult to identify linguistic and cultural bias in items. The fluid boundaries among the cultures students are exposed to including home, school, and outside both these spheres, create a highly individualized and moving target for test developers. For example, in the Valid Assessment of English Language Learners (VAELL) project, math items were reviewed to assess the impact of cultural traits in items. The question researchers asked for each item was, "What cultural aspect(s) of this item might make it inaccessible to a student?" Determining what aspects of an item would keep a student with a different cultural background from accessing the math problem became a challenging exercise. If a student doesn't understand a word is that a cultural difference or just a matter of acquiring vocabulary? It is what is implicit about a word or context that creates a cultural barrier. (see example below, figure # {train example}).

Simply put, addressing the impact of culture in testing means understanding where cultural differences keep students from showing what they actually know. This is

an area that merits much more research attention because developing a completely different test for each and every student is impractical. What should be acknowledged is that at the level of test items, often even though a student does not understand a word or is not familiar with the context of an item she is still likely to be able to access what is being tested (Maria Malagón, personal communication). Students with strong multi-cultural backgrounds are more likely to have the mental flexibility and develop the skills to interpret, decode, or at least adapt to new cultural codes (Maria Malagón, personal communication).

<div style="border:1px solid black; padding:10px;">

Example from VAELL

….something like I didn't know what acres are but I new that if I had this many……

</div>

Providing several different options of a test item and letting the student choose among them is one procedure that will help. Teachers are often unaware of students' cultural backgrounds, particularly in cases where students enter class after the school year has started—a common occurrence with immigrant students. Focusing an ethnographic study on how students are able to choose test options that best reflect their knowledge would be fruitful.

Research Directions

What cultural characteristics of students make it harder for them to access tests? What can we reasonably ask of parents, teachers, and students about these characteristics? Are there patterns we can predict? The adaptability of students who have maneuvered through at least two different cultures and languages contributes to their skill in decoding the puzzling affects of culture. This process or ability is worthy of research. I suggest focusing future studies on the ethnography of students in the context of today's dizzying bombardment of cultural influences. How do students process this information? A better comprehension of how students deal with various cultural spheres will provide better guidelines for how to teach and test them. From a study with this focus, it is possible to learn better how teachers (the great mediators) can first recognize that something needs to be decoded for students, and secondly, how to decode it for them. The information on how to decode it can then be used in test development. In order to prepare effective instructors for a multicultural society, teacher-training programs should include more required course work on cultural and linguistic awareness. It is impossible for anyone to be familiar with all the cultures presented by the diversity of students found in today's classrooms. Teachers, however, should have a sensitivity to different ways of being, doing, and knowing and should be able to address these by using diverse teaching methods.
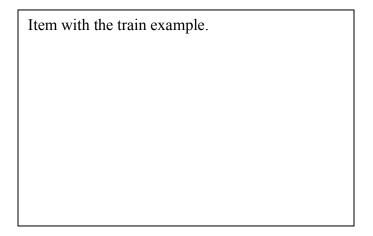
The following points should be considered by teachers in classroom teaching and testing[6]:

- Children are children first and they are alike in basic ways no matter what their cultural background. When people talk about other cultures, they tend to describe the differences and not the similarities. Teachers need to emphasize similarities while acknowledging and valuing differences.
- Feelings of apprehension, loneliness, confusion, and lack of confidence are common when experiencing another culture. These emotions interfere with the learning and assessment process.
- Expectations regarding how children should behave at home and at school vary from culture to culture. Teachers need to find out if a child's behavior which may be inappropriate for an American classroom, is in fact, appropriate within that child's culture. What seems to be logical, sensible, important and reasonable to a person in one culture may seem stupid, irrational, and unimportant to an outsider.
- Children are often judged in school with criteria that vary considerable for the criteria used in their own culture. Using culturally sensitive assessments is essential to the accurate evaluation of student achievement and knowledge.
- Positive school-home relationships are crucial in providing a successful educational experience for all students. Parents need to know what is expected of them and their children in an American mainstream classroom. Linguistic and cultural barriers must be diminished if not abolished by ongoing, meaningful, and comprehensible communication between the home and the school.
- Understanding another culture is a continuous and lengthy process. Unfortunately, stereotyping occurs in the absence of frequent contact or study.
- To know a culture in depth, it is necessary to know the language of that culture. Language reflects all aspects of a culture including and most importantly that culture's values and world-view.

An example of a study geared toward understanding how students access tests would be to first test a culturally diverse group of students on words and concepts. Then test them on their knowledge of mathematical constructs (straight forward math, not word problems). Then use the words and concepts tested in math problems to see which ones kept students from accessing the math. What kinds of words/concepts provide problems? What are the patterns in implicitly cultural words and concepts? An example from VAELL, demonstrated the problem with train. The student could not answer the math question because he did not know that "cars" make up a train. Tk: Provide example.

---

[6] These points were compiled for a workshop presented by Maria Malagón and Marjorie Rosenberg of Malrose Associates, LLC.

Item with the train example.

With regard to testing in general, we need to address current attitudes and expectations towards testing of both mainstream and non-mainstream students. What would help encourage students who don't show-up on test days to participate?

We also need to train students in test-wiseness. We need to involve students' teachers and their families in workshops that addressed the whys and importance of testing[7]. Teach them test-taking skills. Help to decode our culture of testing for them and their families.

References

Boas, Franz
1920   Methods of ethnology. American Anthropologist 22:311-322.

Bourdieu , Pierre
2003   Outline of a Theory of Practice. Original French edition in 1972. First
        published in English translation in 1977. Seventeenth printing, Cambridge
        University Press, Cambridge.

Bourdieu , Pierre and Jean-Claude Passeron
1990   Reproduction in Education, Society, and Culture. Original French edition
        1970. First published in English translation 1977. Sage Publications,
        London.

Brewer, Cynthia A., and Trudy A. Suchan,
2001   U.S. Census Bureau, Census Special Reports, Series CENSR/01-1,
        Mapping Census 2000: The Geography of U.S. Diversity, U.S.
        Government Printing Office, Washington, DC.

Chavers, D. & Locke, P.
1989   The Effects of Testing on Native Americans. Paper for the National
        Commission on Testing and Public Policy.

Cole, Michael
1999   Culture-Free versus Culture-based Measures of Cognition. In The Nature
        of Cognition, edited by Robert J. Sternberg. The MIT Press, Cambridge,
        MA. Pp. 645-664.

Delpit, Lisa D.
1988   The Silenced Dialogue: Power and Pedagogy in Educating Other People's
        Children. *Harvard Educational Review*, vol. 58, no. 3, pp. 280-19.

Eisenhart, Margaret
2001   Educational Ethnography Past, Present, and Future: Ideas to Think With.
        Educational Researcher, vol. 30, no. 8, pp. 16-27.

Emerson, Gloria J.
1983   Navajo Education. In Handbook of North American Indians, edited by
        William Sturtevant. Smithsonian Institution, Washington. Pp. 659-671.

Erickson, Frederick and Gerald Mohatt
1982   Cultural Organization of Participation Structures in Two Classrooms of
        Indian Students, in *Doing the Ethnography of Schooling: Educational
        Anthropology in Action*, edited by George Spindler. Holt, Rinehart and
        Winston, New York, pp. 132-175.

Farr, Beverly P. and Elise Trumbull
1997   *Assessment Alternatives for Diverse Classrooms*, Far West Laboratory. Christopher-Gordon Publishers, Inc. Norwood, MA.

Feuerstein, Reuven
1980   Instrumental enrichment: an intervention program for cognitive modifiability. University Park Press, Baltimore.

Fullilove, Robert E. and Philip Uri Treisman
1990   Mathematics Achievement Among African American Undergraduates at the University of California, Berkeley: An Evaluation of the Mathematics Workshop Program. Journal of Negro Education, vol. 59, no. 3.

Grenfell and David James; with Philip Hodkinson, Diane Reay, and Derek Robbins
1998   Bourdieu and Education: Acts of Practical Theory. Falmer Press, London.

Grimes, Kimberly M.
1998   Crossing Borders, Changing Social Identities in Southern Mexico. University of Arizona Press, Tucson.

Guzmán, Betsy
2001   U.S. Census Bureau, Census 2000 Brief. *The Hispanic Population*. Government Printing Office, Washington, DC.

Harness Goodwin, Marjorie
1997   Children's Linguistic and Social Worlds. In Anthropology Newsletter, vol. 38, number 4. American Anthropological Association.

Heath, Shirley Brice
1982   Questioning at Home and at School: A Comparative Study. In Doing the Ethnography of Schooling, Educational Anthropology in Action, edited by George Spindler. Holt, Rinehart and Winston, New York. Pp. 109-131.

Heath, Shirley Brice
1996   Ways with words: Language, life, and work in communities and classrooms. Tk rest of cite.

Kopriva, Rebecca J. and S. Saez
1997   Scoring LEP Student Responses to Items in Mathematics. CCSSO Publications, Washington D.C.

Kopriva, Rebecca J., and U.M. Sexton
1999   Scoring LEP Student Responses to Science Items. CCSSO Publications, Washington D.C.

Kopriva, Rebecca J.
2000   Ensuring Accuracy in Testing for English Language Learners: A Practical
        Guide for Assessment Development. CCSSO Publications, Washington
        D.C.

Kozulin, Alex, and Boris Gindis, Vladimir S. Ageyev, and Suzanne M. Miller
2003   Introduction: Sociocultural Theory and Education: Students, Teachers, and
        Knowledge. In *Vygotsky's Educational Theory in Cultural Context*, edited
        by Alex Kozulin, Gindis, Vladimir S. Ageyev, and Suzanne M. Miller.
        Cambridge University Press, Cambridge. Pp. 1-14.

Kroeber, A. and C. Kluckhohn
1952   Culture: a critical review of concepts and definitions. *Papers of the
        Peabody Museum of American Archeology and Ethnology*, *47*, 41-72.

Lee, Okhee
2002   Promoting Scientific Inquiry With Elementary Students From Diverse
        Cultures and Languages. In Review of Research in Education, volume 26,
        edited by Walter G. Secada. American Educational Research Association.
        Pp. 23-69.

Mintz, Sidney
2000   Sows' Ears and Silver Linings: A Backward Look at Ethnography. In
        Current Anthropology, Vol. 41, Number 2, April. 169-189.

Ogbu, J.U.
1978   Minority Education and caste: The American system in cross-cultural
        perspective. Academic Press, New York.

Ochs, Elinor, and Bambi B. Schiefflin
1994   Language Acquisition and Socialization: Three Developmental Stories and
        Their Implications. In Language, Culture, and Society, edited by Ben G.
        Blount. Waveland Press, Inc. Prospect Heights, Illinois.

Pellegrino, J. W., Chudowsky, N., & Glaser, R. (Eds.).
2001   *Knowing what students know: The science and design of educational
        assessment.* Washington, DC: National Academy Press.

Pitman, Mary Anne, Rivka A. Eisikovits, Marion Lundy Dobbert Kyung-soo
        Chun, Betty Cooke, Jan Armstrong Gamradt, and Kyun-hak Kim.
1989   *Culture Acquisition: A Holistic Approach to Learning* Praeger Publishers,
        New York.

Philips, Susan U.

1972   "Participation Structures and Communicative Competence: Warm Springs Children in Community and Classroom." *Functions of Language in the Classroom* . Edited by Courtney Cazden, V. John, and D. Hymes. Teachers College Press, New York.

Ramirez, Manual, and Alfredo Castaneda
1974   *Cultural democracy, bicognitive development, and education.* New York: Academic.

Reay, Diane
1998   Cultural reproduction; mothers involvement in their children's primary schooling. *Bourdieu and education; acts of practical theory.* Michael Grenfell, David James, and with Philip Hodkinson, Diane Reay, and Derek Robbins, Falmer press, London. Pp. 55-71.

Sexton, Ursula and Guillermo Solano-Flores
2002   Cultural Validity in Assessment: A Cross-Cultural Study on the Interpretation of Mathematics and Science Test Items. Paper presented at the 2002 meetings of the American Educational Research Association. New Orleans, LA, April 1-5.

Solano-Flores, Guillermo
2002   Cultural Validity: The Need for a Socio-Cultural Perspective in Educational Measurement. Paper presented at the Annual Meeting of the American Educational Research Association. New Orleans, LA, April 1-5, 2002.

Solano-Flores, Guillermo
2003   The Multidimensionality of test Review and Test Design: A conceptual Framework for Addressing Linguistic and Cultural Diversity in Testing. Paper presented at the 10th biennial conference of the European Association for Research on Learning and Instruction, Padova, Italy, August 26-30, 2003.

Solano-Flores, Guillermo and Sharon Nelson-Barber
2001   On the Cultural Validity of Science Assessments. In Journal of Research in Science Teaching, Vol. 38, No. 5, pp. 553-573.

Solano-Flores, Guillermo and Elise Trumbull
2003   Examining Language in Context: The Need for New Research and Practice Paradigms in the Testing of English-Language Learners. In Educational Researcher, Vol. 32, No. 2, pp. 3-13.

Solano-Flores, Guillermo, Elise Trumbull, and Sharon Nelson-Barber
2002   Concurrent Development of Dual Language Assessments: An Alternative to Translating Tests for Linguistic Minorities. International Journal of Testing 2(2), 107-129.

Solano-Flores, Guillermo, Elise Trumbull, and Melissa Kwon
2003   Metrics of Linguistic Complexity and the Metrics of Student Performance
        in the Testing of English-Language Learners. Symposium paper presented
        at the Annual Meeting of the American Educational Research Association.
        Chicago, IL, April 21-25.

Steele, Claude M. And Joshua Aronson
1995   Stereotype Threat and the Intellectual Test Performance of African
        Americans. Journal of Personality and Social Psychology, vol. 69, no. 5,
        pp. 797-811.

Swisher, Karen
1991   American Indian/Alaskan Native Learning Styles: Research and Practice.
        ERIC Digest. ERIC identifier: ED335175. ERIC Clearinghouse on Rural
        Education and Small Schools, Charleston, WV.

Swisher, Karen and D. Deyhle
1989   The Styles of Learning are Different, but the Teaching is Just the Same:
        Suggestions for Teachers of American Indian Youth. Journal of American
        Indian Education, Special Edition, August.

Swisher, Karen and D. Deyhle
1992   Adapting instruction to culture. In *Teaching American Indian student,*
        edited by J. Reyhner. Norman, OK: University of Oklahoma. pp. 81-95.

Tharp, Roland G.
1994   Intergroup differences among Native Americans in socialization and child
        cognition: An ethnogenetic analysis. In: P. Greenfield & R. Cocking, Eds.,
        Cross-cultural roots of minority child development. (pp. 87-105).
        Hillsdale, NJ: Lawrence Erlbaum Associates.

Tobin, J., D. Wu, and D. Davidson
1989   Preschool in Three Cultures: Japan, China, and the United States. Yale
        University Press, New Haven, CT.

Trumbull Estrin, Elise, and Sharon Nelson-Barber
1995   Issues in Cross-Cultural Assessment: American Indian and Alaska Native
        Students. Knowledge Brief, no. 12. Far West Laboratory and U.S.
        Department of Education. ERIC identifier: 388 484.

Trumbull, Elise, Carrie Rothstein-Fisch, and Patricia m. Greenfield
2000   Bridging Cultures in Our Schools: New Approaches That Work. A
        WestEd Knowledge Brief.

U.S. Census Bureau

2002   U.S. Census Bureau, Internet Release. *The Population Profile of the United States: 2000*.

Vygotsky, Lev Semyonovich
1978   Introduction. In Mind in Society, edited by Michael Cole, Vera John-Steiner, Sylvia Scribner, and Ellen Souberman, Harvard University Press, Cambridge, MA, pp. 1-14.

Wang, X. L., Bernas, R., & Eberhard, P.
2002   Variations in maternal support to children's early literacy development in Chinese and Native American families: Implications for early childhood educators. *International Journal of Early Childhood*, 34 (1), 9-23.

Ward, Martha Coonfield.
1971   *Children: A Study in Language* Learning, 1971, Holt, Rinehart and Winston, Inc., New York.

Weisner, T. S.
2001   Anthropological aspects of childhood. In *International Encyclopedia of the Social & Behavioral Sciences*, Vol 3, pp. 1697 - 1701. N. J. Smelser & P. B. Baltes (Eds). Pergamon, Oxford.

Yazzie, Tarajean
2000   Holding a Mirror to "Eyes Wide Shut": The Role of Native Cultures and Languages in the Education of American Indian Students. Paper commissioned by the Office of Educational Research and Improvement, U.S. Department of Education.