It's not my Party: A Critical Analysis of Women and Minority Opposition towards STEM

David C. Martin, San Diego State University & Claremont Graduate University

Abstract

The civil rights era promised an invitation for equity and equality in education was on its way. The invitation was lost in the mail or it is a party that the "marginalized" do not want to attend. In 2004, the National Science Board (NSB) identified a critical shortage of workers in Science, Technology, Engineering, and Mathematics (STEM) fields that will be needed by the year 2020. It was stated that the percentage of women choosing math and science courses dropped by four percent from 1993 to 1999.[1] Absent is the mention of the development of social and cultural capital of gendered, minority, or traditionally marginalized students. Further, there has not been an appreciable increase of women and minority participation in STEM.[2] Why has the invitation's acceptance rate been so low? The purpose of this paper is to offer a critical analysis of how the general disregard for students' lived experiences contributes to the silencing of expression of women and under-represented groups. In this paper, I examine progressive and scientific discourses from the vantage point of critical social theory, theories of ideology/worldviews, and an extended Input-Environment-Output model.[3] I then present a case for why a focus on social and cultural capital would enhance participation in STEM. The hope and possibilities for the future is a return to civil rights era concerns that enhances student educational expression and engagement in a meaningful way.

Keywords: *civil rights, STEM, education, multiculturalism, Critical Theory*

Introduction

I was 10 in 1964 when the Civil Rights Act was signed into law. In 1969, the peace movement of the sixties was at its height. I was 15. With images of students protesting against an unpopular war in Southeast Asia, I was 15 when I became aware that others were not as privileged as I. Prejudice was an issue discussed in schools and at home. Between school desegregation in the U.S. South and the assassinations of President John F. Kennedy, his brother Senator Robert Kennedy, and the preeminent leader of the civil rights movement Martin Luther King Jr. in Memphis—the world

---

1. National Science Board, *An Emerging and Critical Problem of the Science and Engineering Labor Force,* 2004.

2. National Science Board, 2020 *Vision for the National Science Foundation,* 2005.

3. Alexander W. Astin & Antonio, Anthony Lising, *Assessment for Excellence: The philosophy and Practice of Assessment and Evaluation for Higher Education, 2nd Edition* (Lanham, Maryland: Rowman & Littlefield Publishers, Inc., 2012).

seemed on the verge of chaos. Further, we were made aware of the critical importance of farm labor as Cesar Chavez was instrumental in establishing the United Farm Workers Union between 1966 and 1972. These were the years of my high school experience and I graduated when I was eighteen. I am now 60. All of these events marked the Civil Rights era.

Today there exists a growing wealth gap, continued poverty, and predatory English-only language policies which tend toward the restriction of women and minority participation in higher education.[4] Gender and ethnic biases continue to relegate many women and minorities to marginal economic participation. Women and minorities tend to be paid less for the same type of work performed by men.[5] These experiences, combined with the attacks on public education, make me acutely aware that we are facing serious challenges to the American freedoms and hopes that were fought for during the civil rights era.

For me, the most troubling realization is that many of the groups, and individuals, involved in the turmoil of the sixties and seventies continue to move through our lives unseen and unheard. African American, Hispanic, and White voices that should ring in solidarity against oppression are silenced by a social, political, and capitalist system that affords a class system and hinders human thriving. From a Christian perspective, forgotten is the interchange in Matthew 22: 34-40 between Jesus of Nazerath and the Jewish scholars of the time,

> When the Pharisees heard that he had silenced the Sadducees, they gathered together, and one of them [a scholar of the law] tested him by asking, "Teacher, which commandment in the law is the greatest?" He said to him, "You shall love the Lord, your God, with all your heart, with all your soul, and with all your mind. This is the greatest and the first commandment. The second is like it: *You shall love your neighbor as yourself*. The whole law and the prophets depend on these two commandments." [6]

Schools form a platform where students express their worldviews, or tacit ideologies, formulated through family, culture, formal and informal education. Several questions remain, and are followed by new ones: (a) what civil rights era challenges continue to impact under-represented minorities and women? (b) What are the results of aligned, or misaligned, university students' worldviews and institutionalized ideologies and worldviews? (c) Despite explicit recruitment campaigns, why aren't there more women and minorities in STEM?

This article addresses social and cultural capital development,[7] gender differences, race, and ethnicity expression that began to be exposed in the sixties and remain today. Further, a link

---

4. Antonia Darder, *Culture and Power in the Classroom: Educational Foundation for the Schooling of Bicultural Students 20th Aniversary* (Boulder, CO: Paradigm Publishers, 2012); Donaldo Macedo et al, *The Hegemony of English* (Boulder,CO: Paradigm Publishers, 2003); Peter McLaren, *Life in Schools*: *An Introduction to Critical Pedagogy in the Foundations of Education, 6th Edition* (Boulder, CO: Paradigm Publishers, 2014).

5. Michael Apple, *Official Knowledge*: *Democratic Education in a Conservative Age, 3rd Edition* (New York: Taylor and Francis, 2014); Henry Giroux, *On Critical Pedagogy* (New York: Bloomsbury Academic, 2011).

6. American Bible Society, *The New American Bible* (Philadelphia, PA: American Bible Society, 2002), emphasis added.

7. Pierre Bourdieu, "The Forms of Capital," *Handbook of Theory of Research for Sociology of Education*, edited by John G. Richardson, translated by Richard Nice, 46-58 (New York: Greenword Press, 1986); Lindsay Perez Huber, , "Challenging Racist Nativists Framing: Acknowledging the Community Cultural Wealth of Undocumented Chicana College Students to Reframe the Immigration Debate," *Harvard Educational Review* 79 (4), 2009: 704-729; Tara J. Yosso, , "Whose Culture has Capital? A Critical Race Theory Discussion of Community Cultural Wealth," *Race Ethnicity and Education* 8 (1), 2005: 69-91.

is made between these unresolved social issues and resistence to STEM participataion by women and underserved minorities.

Worldviews and Ideology

Individuals acquire ideological frameworks which form the basis of belief. These frameworks of understanding are formed, or constructed, in their social experience of informal and formal education. Ideologies become contained in the individual's broader worldviews[8].

Worldviews are representative of the individual's familial, cultural, and ethical thinking. Lucien Goldman defines worldviews as "coherent and unitary perspectives concerning man's relationships with his fellow man and with the universe."[9] Primary worldviews, such as Secular Materialism and Humanism, along with Theological Pantheism and Monotheism, are rooted in meta-narratives that may express possible truths.[10] The incoherence of individual belief systems are so grounded in tacit theories and tacit generalizations that we can rarely extrapolate truth from worldviews to the positions taken by individuals.[11]

Embedded in US cultures are the many ideologies which can be framed within four global worldviews and ideologies. Frames, idealism, or secular beliefs articulate a possible utopia which human beings are capable of bringing into existence. The U. S. academy was founded historically in the Protestant Christian worldview.[12] Over time, the Protestant ethos has been challenged, or given way, to more global or pluralistic ones. Worldviews play out in the academy. Student responses to socially constructed and embedded worldviews can be understood within the Extended Input-Environment-Output model (Figure 1). This model provides insight into students' situated experience of satisfaction, alienation, tension, or neutrality brought about by alignment, or misalignment, of university environment.

Extended Input-Environment-Output Model (EIEO)

The nature of a student, what they bring to college, their expectations, family background (inputs), contributes to the levels of involvement given and taken. Moreover, the school faculty, administration, and counseling available to the student (the environment) impact involvement and satisfaction.[13]

The contention is that the effort toward content development, teaching technique, and facilities play partial roles in student involvement (outcomes). What the student brings to the university (their inputs) are considered as they relate motivationally and behaviorally to potentially encourage positive outcomes and favorable experiences for all. The ultimate result is a focus on the possible measurable outcomes from learners' higher educational experiences. Table 1 (below) represents a sample of some of the inputs, environmental, and output variables that could be measured.

---

8. Pierre Bourdieu & Passeron, Jean-Claude, *Reproduction in Education, Society, and Culture*, translated by Richard Rice (Thousand Oaks: Sage Publications Inc., 1977/1990); Ninian Smart, *Worldviews: Crosscultural Explorations of Human Beliefs, 3rd Edition* (Upper Saddle River, New Jersey: Pearson, 1999).

9. Lucien Goldmann, *Essays on Method in the Sociology of Literature* (St. Louis: Telos Press, Ltd. 1980), 111.

10. Mary Poplin, *Is Reality Secular?* (Downers Grove: InterVarsity Press, 2014).

11. James Paul Gee, *Social Linguistics and Literacies: Ideology in Discourse* (New York: Routledge, 2012), 16.

12. George M. Marsden, *The Soul of the American University* (New York: Oxford University Press, 1994).

13. Astin & Antonio, *Assessment for Excellence.*

To understand inputs, one reflects on the personal qualities of the learner. For example, the abilities, challenges, and worldviews that a student brings to their university experience. Environment represents the external factors in terms of the learner's studies and may be thought of as treatment. The environment, such as program and policy considerations, varies. Environment leads in combination with inputs to outcomes. Outcomes become the results, or dependent variables, that are affected by the inputs and environmental conditions surrounding the student.

The extend I-E-O model (Figure 1below) engages our attention in the student context of inputs and the relationship of those inputs to the university environment. The student brings certain worldviews, defined above as combined tacit and reasoned beliefs. These beliefs provide experiences influenced in culture and language. The school and classroom environment influences the student educational experience. Teachers, curriculum, and peers interact as stimulus in the experience of the learner.

The hypotheses are that if the learner positively identifies with the environment their overall satisfaction level should be positive. On the other hand, assimilation, or subordination, would afford a negative assessment and would lead to increased alienation and tension. Assimilation, or subordination, means that worldviews (Ideologies, religion, cultures, language) of the classroom are supplanted, or privileged, over those of the learner's home or living community. An example of this would be when a student is encouraged to adopt U.S. cultural norms and English while rejecting a competing religion, language, or culture of their home environment.

Accommodation, or compartmentalization, is less intrusive. The student may feel neutral about adoption of the school/classroom worldview milieu while maintaining his or her home worldview. The experience is modified by his or her ability to live in two worlds. However, if the learner feels pressured to assume the worldview of the teacher/class, the student could reflect a tension and alienation similar to the assimilation scenario. For instance, if the student is able to reflect and reproduce responses that yield a positive grade, then he or she is not asked to denounce his or her home worldview. They would indicate positive or neutral satisfaction. However, living in two different worlds could lead to a negative identity and not fitting in anywhere.

The last scenario would occur when the pupil is presented with a neutral learning environment. Teaching and learning is highly political.[14] On the part of either the teacher, or the student, bias is virtually impossible to resist. This scenario is assumed dubious and highly unlikely.

In the next section I link the extended I-E-O with the concepts of capital that are embedded in Critical Theory. This linkage enlightens any disconnect between student worldviews and those embedded in academic institutions.

Table 1: *Input – Environment – Output Model*

Input	Environment	Outputs
Sex (Gender)	Faculty	Satisfaction
Major in School	Facilities/Labs	GPA
Ability	Courses	Retention (Completion and Drop out)

---

14. Apple, *Official Knowledge*; Henry A. Giroux, , "Schooling and the Myth of Objectivity: Stalking the Politics of the Hidden Curriculum," *McGill Journal of Education* 17 (1981): 282-304; Darder, *Culture and Power*.

Ethnicity	Programs	PhD productivity
Family Background	Peer group interaction	
College Entrance Exam Scores	Language in context	
Home Language		

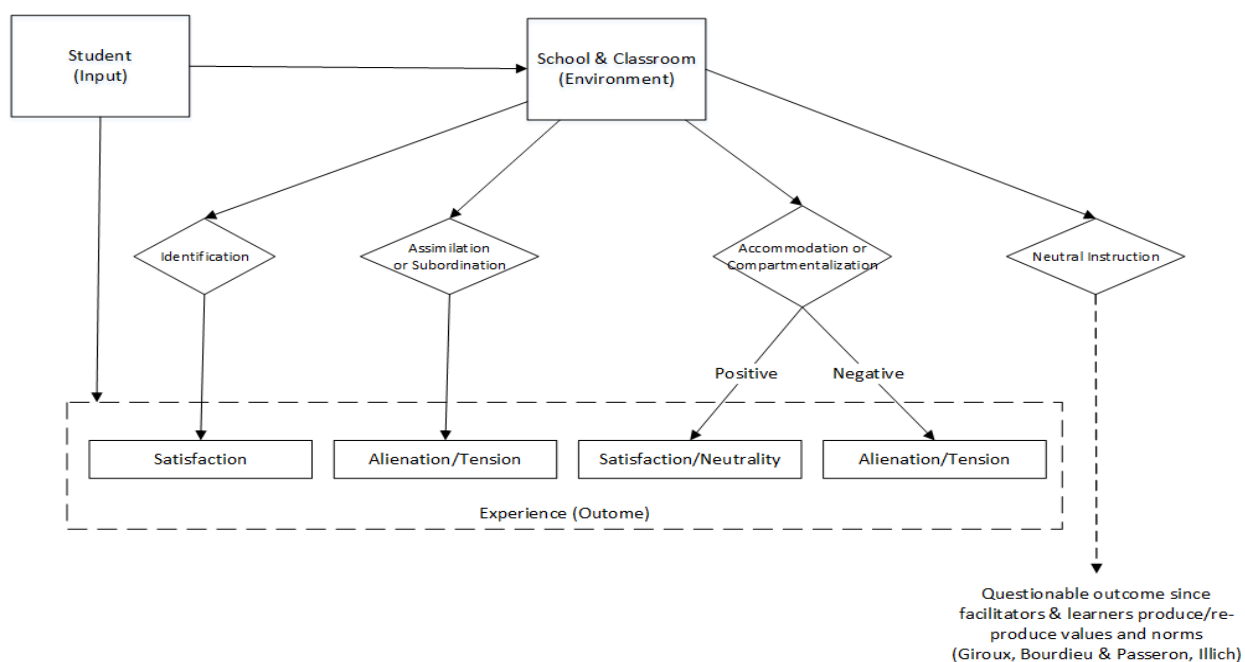Note: Partial listing and sampling for the I-E-O model[15]

Figure 1. Possible Teaching and Learning Outputs

Critical Theory: Power, Language, and Capital

The examination of power, language, and capital situates student experiences (both inputs and environments) within the work of Pierre Bourdieu and Jean-Claude Passeron.[16] In their seminal work, Bourdieu and Passeron have shown empirically that educational systems cannot be seen as separate social arrangements, but should be seen in the context of the larger social class context. Horkheimer and Adorno explain that this larger context consists of is the capitalist system, or environment in the model, producing divisions of labor, engendering the class system, and relegating many to lower classes in socio-economic, race, ethnicity, and gender oppression.[17] This is the environment experienced by women, minorities, and the underserved.

---

15. Astin & Lising, *Assessment for Excellence*.
16. Bourdieu & Passeron, *Reproduction*.
17. Max Horkheimer & Adorno,Theodor W., *Dialectic of Enlightenment: Philisophical Fragments*, edited by Gunzelin Schmid Noerr, translated by Edmond Jephcott (Stanford, California: Stanford University Press, 2007).

As a white male and native English speaker, I have limited access to Feminist and Critical Ethnic and Race Theories. However, I find and maintain solidarity in the concepts of traditional Critical Theory (Frankfurt School) and Critical Pedagogy of Henry Giroux and Peter McLaren. To clarify, I understand a common universal dignity of all human beings as articulated in Roman Catholic Humanism.[18] The root of the discussion is that civil rights contain, amongst other things, education.

Critical Theory provides me a lens with which I can view the issues facing the poor and working class. Horkheimer and Adorno outline Enlightenment Philosophy and metaphors that describe how oppression in power and class is engendered in social and gender inequalities. Oppression is inherent, or essential, in the nature of capitalist systems. The issues of power, class, and status play roles in the oppression of the working and disenfranchised classes. The myth of scarce resources in a capitalist system propitiates the injustice of a system rooted in division of labor which promotes class structures where there are haves and have-nots.

Capital

Bourdieu and Passeron provide the conception of various forms of capital and its production, and reproduction, in society and particularly education. The capitalist system embodies economic, cultural and social capital in a mythical free market. Within the systems, forms of capital are amassed through one's thoughts (intellectual property), work, or effort. Once acquired, capital may then be expended, or exchanged for goods, services, or information with, or from, others. Goods are acquired with economic capital—purchased with wages and inherited capital. Information allows certain individuals to navigate their world in markets. The possibility of obtaining current and future goods, services, or information holds the promise that capital, as a thing, may be continually fabricated and acquired to be used as needed.[19]

Work and effort may be exchanged as a currency, or a medium of exchange, which allows one to increase capital. In the case of money, one may work, or inherit, discretionary funds in order to acquire those things which we need or desire. Money represents the product of economic capital. The means of production is owned and operated by the bourgeois for themselves and their heirs.

Economic capital is converted to social capital which allows individuals to associate and exchange the knowledge and objective knowledge of how to produce and reproduce. Qualifications for cultural capital may be certified through educational institutions. Social capital may be used to inherit, or earn, status, title, and contacts. Social and cultural capital may be used in repeated attainment of economic capital.[20]

Cultural Capital

Cultural capital exists in three forms/states: embodied, objectified, and institutionalized. Embodied state represents long-lasting dispositions as conditions of mind and body. Objectified state exists in forms of pictures, books, dictionaries, instruments, technology, etc. Cultural capital exists in the Institutions of a society, i.e. the banks, schools, and means of production, such as

---

18 . Joseph Ratzinger & Habermas, Jürgen, *The Dialectics of Seculariztation: On Reason and Religion*, edited by Florian Schullar, translated by Brian McNeil (San Francisco: Ignatius Press, 2006).

19. Jean Anyon, "Social Class and the Hidden Curriculum of Work," *Journal of Education* 162 (1), 1980: 65-92; Michael Apple, "The Hidden Curriculum and the Nature of Conflict," *Interchange* 2 (4), 1970: 27-40.

20. Bourdieu, "Forms of Capital."

factories and businesses. Cultural capital in various forms are combined and earned, or distributed, in schools, churches, community centers, and country clubs.

There is an unequal distribution of cultural capital as evidenced in the varying quality of educational institutions and businesses. The inequality is a result of managed, monopolistic, and oligopolistic markets. Unequal cultural capital is inculcated in the capitalist class system. The education system reproduces capital.

Embodied State

The habit of mind, for example management capability, worker ethic, spiritual questing, etc., is created in the time spent in formal and informal learning. As one acquires these habits of mind, or inclinations toward a cultural state, he or she begins to bank cultural capital. The amount of cultural capital that can be developed by any individual depends on the aptitude of that individual to produce more capital. The capacity is related to the context, the purpose, and for what society it is intended. For example, an urban dweller may acquire and have the capacity to use the subway or public transportation with ease. They may not acquire, or have, the capacity to cure meat, grow chickens, etc. that might be available to a rural farmer.

The habit of mind and the ability to accumulate capital is embedded within the family or through kinship relationships. The acquisition and storage of family related capital in its embodied form is enhanced by the age at which it is transmitted to the young. Learning begins in an informal basis and later through a formal basis which is supported by the family. The type of capital, or currency, within their class structures are based on the amount of capital and status of the family. Again, the embodied state of cultural capital allows the family to efficiently manufacture more capital.

Objectified State

The objectified state of capital is realized in the machines, paintings, books, and texts that are acquired. Unlike embodied cultural objects and knowhow, these may be exchanged or transferred as property. The efficiency of the transfer may be dependent on the embodied state (the habit of mind). One may acquire capital through their services or by selling objects. Property may be used with its value established by the society and markets. Prisoners may value soap, cigarettes, and film time in a different way than an elite country club member values these same objects.

The Institutionalized State

The political processes install a state education system that reproduces itself. Within the education system, cultural capital develops a qualification and award system. One may produce, or utilize, technology or practices—the education system certifies them. Cultures are embedded in the social construction of school. Other institutions may certify membership and attest to cultural capital, church membership is given as children progress and grow within the institution. For example, baptismal, confirmation, and marriage certificates are issued as evidence of privileges gained in completion of training in the church. Cultural capital of this nature enhances the objectified state. Based on the hierarchical nature of academic disciplines, cultural capital may be ex-

changed at varying rates of return. Certification in empirical or positivist disciplines (physical sciences) returns more money than social sciences or humanities. Cultural capital may be engaged in imparting status that may be converted into social capital.

Social Capital

Gee describes social positioning available to be filled by the Discourser. Social constructions impact all of us as participants in the social. Gee extends that to students in school, he states, "A good deal of what we do with language, throughout history, is to create and act out different kinds of people for all sorts of occasions and places."[21]

Associations and memberships equip individuals with status. For example, club or gang membership provides privileges within a particular social context. Memberships may entitle members with the ability to gain credit to be used to earn credentials. Status may be granted to enable future capital—recommendations to membership and membership of others. Recommendations for a particular school or university, for example: an individual might give kin a similar recommendation for schooling, employment, or investment opportunity keeping the capital within the family.

The breadth of a social network implies a greater degree of capital. For instance, attendees at an elite school like Yale, Harvard, or Stanford have a tendency toward a larger degree of cultural and social capital. Familial membership may be extended to others through adoption, marriage, or invitation to join through extended family. The power inherent in social capital is available to those who may declare and be verified as members. The oldest may certify that others may declare membership in the family. The president of the club certifies membership that could be used in a business arrangement, a registrar processes university transcripts that could be used for employment, and banks certify credit worthiness that could be used to purchase other capital items.

Linguistic Capital

The ability to speak in a certain context defines other capital that a person may obtain or maintain. For instance, students of color come to school immersed in cultures such as family, community and languages. Learners are often called upon to provide translation and navigational services within the cultures in which they live.

Community Wealth and Capital

Communities develop wealth and capital in various forms. What follows is a capital model that may be evident in poor and working class communities. In these communities there are economic and racial tensions which create difficulties for some minorities, such as factors for success in college. In a game of blame-the-victim, a deficit deterministic model is sometimes employed to explain the lack of performance of non-white and lower class students. These racial, ethnic, gender and language issues are more a function of acquiring and maintaining what researchers have addressed by expanding Bourdieu's articulation of cultural, social, and linguistic capital to include the community wealth categories of aspirational, familial, navigational, linguistic, and resistance capital.

---

21. James Paul Gee, *Social Linguistics and Literacies: Ideology in Discourse* (New York: Routledge 2012), 12.

Familial Capital

Communities are formed within kinship relationships. Kinship is defined within birth associations but may extend to family friends and through associations. Church membership, school friends, fellow workers, or community group members may become aunties, uncles, brothers, and sisters. People's ability to form, maintain, and navigate kinship bonds further forms familial capital. These bonds can be utilized in times of need, to find employment, and in the celebration of life achievements among the other interpersonal relational aspects of life.

Navigational Capital

Language is an important aspect of negotiating social contexts. Being able to know how to "get things done" is evidence of navigational capital. Navigational capital expresses itself in acquiring and selling products and services in community and social environments. Sometimes employed in attaining hard to find, or scarce, resources for family or work.

Resistance Capital

Resistance capital is brought to bear in learning and social contexts that warrant that individuals take a stand for something. Resistance capital is employed when lower and working class individuals resist oppression and when acting as active agents in just claims for rights for themselves and the community.[22]

Conversion of Capital

Economic capital may be the source of all forms of capital. Cultural and social capital may be acquired via expenditure of economic capital. If one loses economic capital, they run the risk of losing social and cultural status. With enough social capital, an individual may borrow, or acquire, economic capital and thus restore, or increase, cultural and social capital.

Each type of capital may be differentiated by the way in which capital may be exchanged for economic capital. For example, cultural capital in the form of a painting may be exchanged for money more easily than social capital such as being the president of a club. However, the president of the club may have easy access to the banker who may give limited financial credit. Large corporations may borrow bailout funds from the government based on the number of employees that they employ or relationships with government officials.

Cultural and social capital may be exchanged for membership of a child into elite schools. One can exchange a habit of mind or facility for increased status. Status may require sustained projection from the sponsoring institution or person. The ability to exchange forms of capital has a direct result in educational outcomes.

These forms of capital represent those which may be brought to bear when tension and alienation of worldviews are experienced. Family is a source of strength and solidarity, navigation capital assists the student in negotiating unfamiliar, or uncomfortable social situations, and resistance capital provides the internal strength to confront and reject oppression. The extent that

---

22. Huber, *Challenging Racist Nativists Framing*; Yosso, *Whose culture has capital?*

familial, navigation, and resistance capital exists for the student has a direct impact on their educational outcome.

From Capital to Educational Outcomes

The connections between capital and educational outcomes may assist us in determining possible levels of student satisfaction and their motivation for college degree choice. For example, when a female with a worldview centered in a feminist ideology experiences oppression in a science course due to male dominated patriarchal curriculum, she may find greater satisfaction, and choose to engage, in feminist study rather than the other major.[23]

In the next section, I critically engage in the examination of printed works and relate them to acquisition and sustenance of social and cultural capital. In the excerpts provided, we find opportunities to understand the oppressive possibilities and engage in alternative reconstructions.

Educational Outcomes

School environments consist of programs, curriculum, discourse, practices, and staff. The learner's own psychology and interaction with the environment combine to determine educational outcomes. Educational outcomes represent the worldviews, or tacit ideologies, formulated through student's culture. In order to understand the challenges that remain from the civil rights era we examine the progressive social discourse. The comments below must be taken in context of social and cultural capital and education policy that exists around the classroom. The potential alignments, or misalignments, of worldviews and outcomes for women, minorities, and underserved begin to become clearer. The following critique calls attention to contradictions between possession and development of capital and worldviews. The alignments, or misalignments, provide links to the oppression and resistance of women and under-represented minorities in school.

Expectations for the Education of Latinos in the U.S.

Fernando Reimers is the Ford Foundation Professor of International Education and the Director of Global Education and International Education Policy at Harvard University. Reimers is considered an educational policy expert. In a public television interview with Maria Hinojosa,[24] he asserts what may be taken as the progressive views of many U. S. Latinos. In my view, Reimer's views exemplify progressive education policies which must be reviewed and challenged.

The interview begins:

Hinojosa: "Every day, thousands of students drop out of high school. Condemned to a life of dead end jobs and low wages. *How do we stop what many consider a threat to the future of our country?* One man thinks he has the answers: *leading educational authority*, Fernando Reimers…"

---

23. Jennifer M. Gore, *The Struggle for Pedagogies: Critical and Feminist Discourses as Regimes of Truth* (New York: Routledge, 1993).

24. Maria Hinojosa, *One on One with Fernando Reimers, Chicago, Illinois, November 1, 2009*. Accessed April 23, 2014, http://www.wgbh.org/programs/programDetail.cfm?programid=12&.

The implication is that we will be hearing about the national issue of dropout rates as "a threat to the future of our country." Fernando Reimers is a "leading educational authority" who will articulate an educational policy "answer."

> Hinojosa: "Let me ask you this, a lot of people watching this show may think about their own schools and they say 'wow, within a matter of a couple years, we didn't have any Latinos a few years [ago], now we have dozens upon dozens.' Many teachers, educators, etc. just look at this and they say, 'It's a problem,' when you see that scenario what do you say?"

> Reimers*: "It's an opportunity…our children are going to be the future of this country [U.S.]—25% of the population. So, it is in everybody's interest to make sure that we support their academic success. And, we know that they can succeed. I think that this involves two things—making sure that the majority of those children are ready to go to college, and making sure that we increase the number of Latino kids who go for science, and technology, and engineering careers. This is doable, we know what it will take to do that, and we should get on with that task."*

There is intertextuality between progressive and critical discourse. I agree that equal participation for women and Latinos, as well as for other races and ethnicities, is critical for individual social and educational future prospects. However, lower and middle class students do not possess the forms of capital required to enter the privileged field of STEM as the elite class of learners do. The poor and lower-middle classes are disadvantage by their economic and social status in terms of education and jobs. In the stanza above, there is an overstated claim that providing academic success is as easy as doing, and further that we "should get on with that task." Missing from this discourse is recognition of the impact of hidden curriculum experienced by marginalized learners. Reimers speaks from a functionalist perspective. He is not considering, as Anyon has shown, that class structures provide a different 'hidden curriculum' and educational experiences and expectations. Anyon found that elite students are asked to think critically as befitting their executive class, while poor or lower middle class students have all of their activities directed by those in classes above them. These structures of educational experience reproduce the existing class hierarchy and are hidden from the view of the student. The marginalized student experiences a patriarchal class structure that inhibits success in school.[25]

> The interview turns to language issues:

> Hinojosa: "But, a lot of people think, 'well, you know, I mean, whenever you talk about schools,' people will say, 'we have, you know, a hundred different languages [sic], *and that's a problem because we have to teach all these kids English,* and that's hard.' And, again you say what when you faced with that reality?"

> Reimers*: "Yeah, I think about that differently. I think that this is one of the few countries that thinks about linguistic diversity as problem. Most countries around the world think about linguistic diversity as an asset, and I think that one of the opportunities for this nation is to develop the global skills of all students. Not just immigrant students. Global skills*

---

25. Anyon, *Social Class and the Hidden Curriculum*.

include a positive disposition toward cultural difference. The ability to speak foreign languages at advanced levels, and a serious and deep understanding of global topics, whether those are trade, global climate issues, and so on. So, the children that come from immigrant homes, and for whom navigating two different cultures as a daily experience are actually an asset. They could teach the rest of the kids and we should start thinking about as an opportunity."

The myth "that there are a hundred different languages" should be addressed. There are five predominate non-English languages represented in U.S. classrooms. These are Spanish (79%), Chinese (Cantonese) (15.5%), Vietnamese (2.0%), Hmong (1.6%), and Korean (1.0%). Furthermore, in 2005, 27.7 million (fewer than 50%) of urban students were white English only non-Hispanic students.[26]

In this regard, I also agree with the assessment that multiculturalism along with multilingualism is a benefit. The development of cultural, social, and linguistic capital is extremely advantageous to all students. Nonetheless, there is currently a deficit in the number of teachers capable of meeting the needs of multilingual/multicultural students. As Gandara and Hopkin's state,

> Given the large and increasing number of English Language Learners (ELs) in U.S. public schools, it behooves the educational community—and the nation as a whole—to improve the educational environments and opportunities for these students and their teachers. Failing to do so will put the entire education system at risk.[27]

Students who traditionally lack access to various forms of social and cultural capital are not qualified experts. Successful education of women, minorities, and the underserved requires teaching to be conducted by qualified teachers. This is particularly pertinent in STEM disciplines.

The needs of long term English Language Learners must be specifically addressed with instruction containing academic language in domain specific curricula. Successfully overcoming the oppressive gender bias and English language only (restrictive language) policies experienced by many women and minority students will require a great deal more support for capital development. The particular goal must be to provide a type of educational environment that increases the navigational and resistance capital needed to equalize the effects of the White and Asian patriarchal bias that exist in STEM. The invitation to STEM must be accompanied by development of the forms of cultural and social capital necessary to compete for jobs and social interests of women and minorities.

The interview participants begin an examination of student-teacher rapport, parent participation, and the socialization of students:

> Hinojosa: "How do you convince teachers that only see difficult mountains to climb… what tools do you give them? To actually say, 'I'm not going to worry about them *all* dropping out because I've got a solution.'"

---

26. Patricia Gandara & Hopkins, Megan, *The Changing Linguistic Landscape of the United States* in *Forbidden Language* (New York: Teachers College Press, 2010), 9.

27. Ibid., 17.

Reimers: "Let me answer at two levels. *The students that I teach [at Harvard] are students that are preparing to be leaders*. To influence change at a systemic level. My program is one of the more culturally diverse programs in the School of Education. Students find that a resource…but, back to middle school or high school for example, if we are trying to develop a positive orientation toward cultural difference, if we're trying to make kids be excited, and to think about the opportunities that lie in difference? *What better way to do that than to give children an opportunity to socialize, to make friends with, kids who come from different parts of the world*."

In the interchange, Reimers affirms that the students that he teaches at Harvard are privileged as "leaders." These students possess the various types of capital that are necessary to succeed, as measured by policy leadership, and "being able to develop their own intercultural competencies." He then indicates the benefits and "opportunity to socialize and make friend in different cultures."

With changing demographics in urban centers, schools in this area are becoming more segregated. The class struggle of multilingual, multicultural, and poor students impacts the social and educational goals. The relationships of power are constructed, internalized, and institutionalized in the lived lives of our bicultural students.

Gendered, poor, and marginalized students should not be seen as fictional or hypothetical individuals, families, or groups. Our students are real people who are in many aspects of life unseen, unheard, and oppressed. The conjecture here is that socialization and contact achieves equity. Reimer's statement discounts the segregation effects on children of various classes' experience in school. In fact, most bilingual and bicultural students may experience their home language and culture devalued. They and their families are marginalized and exist separately from each other throughout school. Their cultural experience is a rewritten definition of freedom, liberty, and justice for all. Gandara and Hopkins state that, "Latino students who have not fully mastered English by high school have only about a 40% chance at best of completing high school and acquiring a diploma with their age mates."[28] The number of students who are falling into lives of poverty and voice-less-ness is staggering. Those few that make it to university carry the inputs of this socialization and oppression.

All forms of capital contain the possibilities for life and must be developed. It is our language that allows us to invent and reinvent university cultural and social capital. By sharing our lives, through language, we develop communities of solidarity and empathy. Human thriving and a positive human existence are established by each of us as individuals as we create lives together that we love.[29]

Reimers goes on to discuss civics and character education. Referring to research being done in Monterey, Mexico:

Reimers*:* "I am at the moment conducting a large study in Mexico where we are comparing different ways to do citizenship education. And, I was in Monterey just a week ago…talking to middle school students, and one of our interventions is precisely telling the kids, with support from the teachers, find one problem that you want to work on. Get organized and solve it. So, here I have a group of kids…*these are twelve year olds who decided – we're going to make sure that we have a clean classroom and a clean school. We can't*

---

28. Ibid., 11.
29. Macedo, et al., *Hegemony*.

deal with an entire neighborhood, but we can make that difference. And, that became part of the curriculum. They organize their peers into making sure that they have a clean environment."

The concern here is that teacher power may have been employed to enlist students in providing their own janitorial services. Students and teachers need to be responsible for their environment. Schools can be responsible for the day to day care of the resources entrusted to them. It is the students' and teachers' civic responsibility to safeguard and clean rooms to an extent.

However, if Reimers is referring to the general need for maintenance and janitorial services, then objection should be raised. A clean environment, along with good and plentiful food, is a required antecedent to learning. The opportunity to develop resistance capital, to organize students, and to advocate for equal services is lost. Alternatively, the curriculum should have contained elements that allow working and lower class individuals to organize and fight for fair and equal treatment. Students should have been galvanized, along with their parents, to advocate for resistance, equality, and equity rather than being used as a source of free labor.

The program shifts to a discussion about the teacher's relationship with parents:

Reimers: "I think that Mexican parents, like any parents, love their kids. And they want the best for their kids. *They may have different ideas of what that means*, so that they may think for example, that if you are the older daughter in the family, *it is reasonable that you should be expected to help with the little ones and all kind of chores*. And, it is very hard to take AP classes when you are taking care of your younger siblings. *So, it is very necessary for teachers to have a conversation with parents and help them understand the difference between completing high school, or not, the difference between going to a four-year college versus a community college, the difference between an advanced curriculum and a curriculum that is not as rigorous and advanced*. And then, what it takes in the form of support and time for the kids. One of the most critical resources in education is time. You have to spend the time. *Parents can make that possible or difficult, if you don't understand the difference that it makes*."

The subject of this scenario reflects the class and capital differences. Reimers proposes that the teachers interject their own values into the family lives of the parents and the students. This promotes an educational system that ignores parental struggles and lacks an empathetic view of the plight of the working poor. The school must be a source of family of services, community development, and support common striving. If we were to take Reimers' recommendation, we would engage in reproduction of class reproduction of values. Depending on how Reimers' strategy is operationalized, the teacher-parent relationship degenerates into a subject-object association.[30] The teacher becomes an agent of oppression rather than one of freedom and solidarity.

As we draw this analysis to a close, we will recognize the potential to exacerbate university students' experience of oppression and restricted social justice. College programs that support engagement in the social and cultural issues of women, minorities, and the marginalized stand the chance to reduce tension and promote enrollment in school; more specifically the STEM programs that Reimers promotes. If STEM programs continue to favor White and Asian dominate discourse,

---

30. Paulo Freire, *Pedagogy of the Oppressed* (New York, Continuum Publishing, 1970/2012).

women, minorities, and the marginalized may forgo STEM in favor of finding an educational experience that supports their desire for justice through legal, social, and ethnic studies. Reimers acknowledges that for there to be a more equal society, we need more Latinos in STEM. However, I believe that for him it is an issue of educating/schooling students (providing them with the forms of capital they need) in order to access those fields. His is a progressive discourse. In this aspect there can be agreement, and intertextuality, with critical discourse. We can agree with his urging that the school system/policymakers move on with the task of educating individuals who represent the future of the country.

The educational policy environment does not provide a complete viewpoint. I continue to draw conclusions about educational program participation by examining a specific science classroom.

Science Classrooms

Students are faced with various discontinuities in policy and politics. The issues that follow are not specific to gender or ethnic experiences. The discussion is offered as an example of potential silenced discourse and a view of prospective tension in the classroom.

The argument could be made that the following example is one example of a single extreme, or intractable, view. However, the worldviews of popular authors such as Richard Dawkins and Peter Atkins represent this view in the general public and is expressed in the classroom.[31]

David Barash is a University of Washington, Professor of Psychology and an evolutionary biologist. In an op-ed describing a beginning of the year lesson, "The Talk,"[32] which covers Barash's position regarding evolution and religion, Barash states, "It's irresponsible to teach biology without evolution and yet many students work about reconciling their beliefs with evolutionary science." The implication is that Barash clearly finds it unethical to teach religion along with science. Barash briefly outlines the concept created by Steven Jay Gould of "non-overlapping magisteria" (NOMA). Barash further indicates, "He [Gould] was misrepresenting both science and religion."

The dispute is that Barash does not believe that God exists. He does not accept that there is any place for a discussion of biology in conjunction with God. Barash continues, "While I respect their beliefs, the entire point of 'The Talk' is to make clear that, at least for this biologist, it is no longer acceptable for science to be the one doing those routines, as Professor Gould and NOMA have insisted we do."

From here, the purpose of this analysis is not intended to provide a comprehensive counter argument to Barash's. What the reader should appreciate is that the italicized sections of the above interview indicate a "habit of mind," or a particular privileged form of capital. Barash maintains that his is the only discourse which will be accepted, or valued, in his classroom. Barash's argument, and general attitude, forecloses any other worldview. The assertiveness of his approach forces a student with a different point of view into either an assimilated or accommodated position. In the model in Figure 2 above, we notice that assimilation means tension and alienation. While accommodation could lead to a positive or neutral outcome, it could also lead to tension and alienation.

---

31. Peter Atkins, *On Being: A Scientist's Exploration of the Great Questions of Existence* (Oxford: Oxford Press, 2011); Richard Dawkins, *The God Delusion* (New York, New York: Houghton Mifflin Company, 2006).
32. David P. Barash, "God, Darwin and My College Biology Class," *The New York Times*, September 27, 2014.

Scientific innovation requires conflict. Conflict generated in the scientific community is initiated by the development of a new, or revolutionary, concept that may not be received well by the established "scholarly community." The commonly understood facts are learned in the academy, presented from the textbook, and as given facts.

A consensus theory of science is one that underemphasizes the serious disagreements over methodology, goals, and other elements that make up the paradigm of activity of scientists. If scientific consensus is continually required, then students would not be permitted to see that without disagreement and controversy, scientific progresses, or would be progress, continues at a much slower pace.[33]

In science, as much as with any discipline, tacit theories and tacit generalization are taught as fact. Visibility to the disagreements, hypothesis, and testing of hypothesis is ignored for the sake of social control. Further, "little or no thought has evidently been given to the fact that hypothesis-testing and application of existing scientific criteria are not sufficient to explain how and why choice is made between competing theories." Existing theories are accepted at face value without primary research into opposing views. This leads to a silencing of any opposing views. The natural ongoing controversies in science are "kept" from the student; in effect, alternated views are "hidden" from them.[34]

Scientific knowledge as it is taught in schools has, in effect, been divorced from the structure of the community from which it evolved and which acts to criticize it. Students are "forced," because of the very absence of a realistic picture of how communities of science apportion power and economic resources, to internalize a view that has little potency for questioning the legitimacy of the tacit assumptions about interpersonal conflict that govern their lives and their own educational, economic, and political situations.[35]

The science classroom under Barash's model is a reproduction of existing scientific thought. While this argument does not address women or minorities specifically, if one is already predisposed to experience school as a place of limited expression, then would one be resistant to enter the field?

Conclusion

The Civil Rights and Peace movements of the 1960's asked us to engage in the principles of equality and equity for all. Due to recent challenges to affirmative action in education, as well as political failures to engage in reduction of the wealth and opportunity gaps for women and minorities, class, gender, and ethnic struggles continue. Perhaps these issues provide motivation for women and minorities to refuse the invitation to the STEM party. Conceivably, the party is not seen as one worth attending.

Gendered, minority, and underserved students may seek, and find, meaning in school, and specifically in humanities and social sciences.[36] As feminist theorists have indicated, suffering is assuaged as our spirits join for the betterment of all.[37] Transformation and change is desired to elevate the society and our institutions. The vision is for the country, institutions, and classrooms

---

33. Apple, *Hidden Curriculum*, 30.
34. Ibid., 31.
35. Ibid., 32.
36. Alexander W. Astin, Astin, Helen S., and Lindholm, Jennifer A., *Cultivating the Spirit: How College Can Enhance Students' Inner Lives* (San Francisco, California: John Wiley & Sons, Inc., 2011).
37. Parker J. Palmer, *The Courage to Teach: Exploring the Inner Landscape of a Teacher's Life* (San Francisco: John Wiley & Sons, Inc., 1998/2006).

to be better. The ultimate goal is for the achievement of promise and possibilities of the self-expression of all. Women and minorities may be finding that the energy required to resist and/or oppose oppression, and those factors which limit possibilities, takes courageous action.

What we can say now is that the college environment represents a particular dominant ideology. University and school environments require students to take on assimilation and accommodation strategies which lead to alienation and tension. Satisfaction may be found if students acquire the "codes of power," and if they are made explicit, without having to eradicate their values and lived experiences.[38] The issues are indeed the case that the privileging of dominant ideologies can turn the classroom into a regime of truth that has the potential to alienate "others" or those who do not share in the same values.

The prolonged institutionalized mismatch between students' worldviews and college environments are a possible source of women and minorities selecting not to engage STEM fields. Instead they favor educational pursuits in domains that meet their needs for personal, spiritual, religious, and social expressions.

There is a need to build familial, linguistic, social, cultural, and navigational capital within formal and informal educational frames. Universities that provide environments for the development of resistance and spiritual capital will experience an expansion of all programs. All oppressed classes must be included in discourse for protection now and reparations of the past under class objectification. These are the human rights which were addressed beginning with the civil rights era of the 1960's. Human rights overlap and enlighten other rights—to be informed truthfully; the right to freedom of expression, education, and culture; the right to communicate are taken together.[39]

Effective educators will comprehend serious questions of how gender, race, ethnicity, and language can negate, or impact, our rights. The cessation of human rights affects, among other things, the health and wellbeing of the learner, their kin/family, and society. Students have a right to speak in their own language. Learners should be encouraged to express unpopular opinions and to resist authority and oppression. In an effective democratic society and classroom, a balance is struck and conflict protocols exercised by subject-subject relations that govern the consequence of conflicting speech rights.[40] The classroom must create a living participatory laboratory for the exercise of democracy and a freedom to co-construct their being. This is a life affirming aim of education.

The Academy processes must denounce restrictive language policies that inhibit intentional classroom discourses that lead to silencing student voices. We must reject gendered, racial, and cultural norms that discount individualist and pluralistic views. Prejudice and bias lead to a breakdown in fellowship, communion, and understanding. Becoming a competent intercultural communicator will mitigate the consequences by addressing the dignity of each student and engaging in intentional, or "mindful," practices. Utilizing intentional listening, reframing statements, preserving student dignity, and establishing trust, remediates and facilitates intercultural communication.

---

38. Lisa D. Delpit, "The Silenced Dialogue: Power and Pedegogy in Educating other People's Children," *Harvard Educational Review* 58 (3), 1998: 280-298; Lisa D. Delpit, *Other People's Children: Cultural Conflict in the Classroom* (New York: New Press, 1995/2006.

39. Huber, *Challenging Racist Nativists Framing*.

40. Darder, *Culture and Power in the Classroom*.

Effective teacher development will incorporate listening skills that enhance gender, racial, and class discourse acceptance in their programs.[41]

Our hope of the civil rights movement was that institutions and society develop an attitude of excellence and thriving for all. That the struggle for fair society would break down the preference for the rich and powerful in favor of equality for the poor and disenfranchised. That those who are doing well, will continue to do well, but that they would move toward an increased awareness that with privilege comes an obligation. We all have an obligation under social justice. We must speak out and act.

The aim of the civil rights movement, and our aim as a society, was to provide, and participate actively, in creating social systems to produce, and reproduce, self-sustaining harmony, solidarity, and communion. A return to this future is one into which it is worth living. One where we are our brothers' and sisters' keeper. In this future we love each other as we love ourselves.

Bibliography

Anyon, Jean. 1980. "Social Class and the Hidden Curriculum of Work." *Journal of Education* 162 (1): 65-92.

Apple, Michael. 1970. "The Hidden Curriculum and the Nature of Conflict." *Interchange* 2 (4): 27-40.

Apple, Michael W. 2014. *Official Knowledge: Democratic Education in a Conservative Age.* 3rd. New York: Taylor and Francis.

Astin, Alexander W, and anthony lising antonio. 2012. *Assessment for Excellence: The Philosophy and Practice of Assessment and Evaluation for Higher Education.* 2nd. Lanham, Maryland: Rowman & Littlefield Publishers, Inc.

Astin, Alexander W, Helen S Astin, and Jennifer A Lindholm. 2011. *Cultivating the Spirit: How College Can Enhance Students' Inner Lives.* San Francisco, California: John Wiley & Sons, Inc.

Atkins, Peter. 2011. *On Being: A Scientist's Exploration of the Great Questions of Existence.* Oxford: Oxford Press.

Barash, David P. 2014. "God, Darwin and My College Biology Class." *The New York Times*, September 27.

Bourdieu, Pierre. 1986. "The Forms of Capital." In *Handbook of Theory of Research for Sociology of Education*, by John G. Richardson, translated by Richard Nice, 46-58. New York: Greenword Press.

Bourdieu, Pierre, and Jean-Claude Passeron. 1977, 1990. *Reproduction in Education, Society, and Culture.* Translated by Richard Rice. Thousand Oaks: Sage Publications Inc.

Darder, Antonia. 2012. *Culture and Power in the Classroom: Educational Foundation for the Schooling of Bicultural Students.* 20th Aniversary. Boulder, Colorado: Paradigm Publishers.

Dawkins, Richard. 2006. *The God Delusion.* New York, New York: Houghton Mifflin Company.

Delpit, Lisa D. 1995, 2006. *Other People's Children: Cultural Conflict in the Classroom.* New York: New Press.

Delpit, Lisa D. 1998. "The Silenced Dialogue: Power and Pedegogy in Educating other People's Children." *Harvard Educational Review* 58 (3): 280-298.

Freire, Paulo. 1970, 2012. *Pedagogy of the Oppressed.* New York, New York: Continuum Publishing.

---

41. Stella Ting-Toomey, *Communicating Across Cultures* (New York: The Guilford Press, 1999).

Gandara, Patricia, and Megan Hopkins. 2010. "The Changing Linguistic Landscape of the United States." In *Forbidden Language: English Learners and Restrictive Language Policies*, edited by Patricia Gandara and Megan Hopkins, 7 - 19. New York: Teachers College Press.

Gee, James Paul. 2012. *Social Linguistics and Literacies: Ideology in Discourse.* Fourth. New York: Routledge.

Giroux, Henry A. 1981. "Schooling and the Myth of Objectivity: Stalking the Politics of the Hidden Curriculum." *McGill Journal of Education* 17: 282-304.

Giroux, Henry. 2011. *On Critical Pedagogy.* New York, New York: Bloomsbury Academic.

Goldmann, Lucien. 1980. *Essays on Method in the Sociology of Literature.* Edited by William Q Boelhower. Translated by William Q Boelhower. St. Louis: Telos Press, Ltd.

Gore, Jennifer M. 1993. *The Struggle for Pedagogies: Critical and Feminist Discourses as Regimes of Truth.* New York: Routledge, Chapmand and Hall, Inc.

Hinojosa, Maria. 2009. *One on One with Fernando Reimers.* Chicago, Illinois, November 1. Accessed April 23, 2014. http://www.wgbh.org/programs/programDetail.cfm?programid=12&.

Horkheimer, Max, and Theodor W Adorno. 2007. *Dialectic of Enlightenment: Philisophical Fragments.* Edited by Gunzelin Schmid Noerr. Translated by Edmond Jephcott. Stanford, California: Stanford University Press.

Huber, Lindsay Perez. 2009. "Challenging Racist Nativists Framing: Acknowledging the Community Cultural Wealth of Undocumented Chicana College Students to Reframe the Immigration Debate." *Harvard Educational Review* 79 (4): 704-729.

Macedo, Donaldo, Bessie Dendrions, and Panayota Gournari. 2003. *The Hegemony of English .* Boulder: Paradigm Publishers.

Marsden, George M. 1994. *The Soul of the American University: From Protestant Establishment to Established Nonbelief.* New York: Oxford University Press.

McLaren, Peter. 2014. *Life in Schools: An Introduction to Critical Pedagogy in the Foundations of Education.* 6th. Boulder: Paradigm Publishers.

National Science Board. 2004. "An Emerging and Critical Problem of the Science and Engineering Labor Force." *National Science Board.* January. http://www.nsf.gov/statistics/nsb0407.

—. 2005. "National Science Board: 2020 Vision for the National Science Foundation." *National Science Board.* December 28. http://www.nsf.gov/nsb/publications/landing/nsb05142.jsp.

Palmer, Parker J. 1998, 2006. *The Courage to Teach: Exploring the Inner Landscape of a Teacher's Life.* San Francisco: John Wiley & Sons, Inc.

Poplin, Mary. 2014. *Is Reality Secular?: Testing the Assumptions of Four Global Worldviews.* Downers Grove, Illinois: InterVarsity Press.

Ratzinger, Joseph, and Jurgen Habermas. 2006. *The Dialectics of Seculariztation: On Reason and Religion.* Edited by Florian Schullar. Translated by Brian McNeil. San Francisco: Ignatius Press.

Smart, Ninian. 1999. *Worldviews: Crosscultural Explorations of Human Beliefs.* 3rd. Upper Saddle River, New Jersey: Pearson.

Ting-Toomey, Stella. 1999. *Communicating Across Cultures.* New York: The Guilford Press.

United States Conference of Catholic Bishops. 2002 . *The New American Bible.* November 11. http://www.vatican.va/archive/ENG0839/_INDEX.HTM.

Yosso, Tara J. 2005. "Whose Culture has Capital? A Critical Race Theory Discussion of Community Cultural Wealth." *Race Ethnicity and Education* 8 (1): 69-91.

David C. Martin is a Ph.D. candidate in the San Diego State University and Claremont Graduate University Joint PhD Program. Mr. Martin's research interests include post-secondary student worldviews and the role they play in student satisfaction, degree choice, and cultural proficiency. In his spare time he enjoys following his favorite college fast-pitch softball teams.