

The right climate for student achievement: A Vygotskian approach

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Chapter One: Introduction

Anyone studying education must at some point address the following question: How do people learn? Cognitive psychologists (Berkeley, 2007) posit that knowledge is “actively *constructed* by learners in response to interactions with environmental stimuli... learners respond not to external stimuli but to their interpretation of those stimuli,” and that “language and culture play essential roles both in human intellectual development and in how humans perceive the world”. In Piaget’s words, “knowledge is not a copy of reality,” but rather is constructed, and constructed differently at different stages in one’s life, dependant on different environmental influences. Decades later, Paulo Freire (1998) argues that “to teach is not to transfer knowledge, but to create the possibilities for the production or construction of knowledge” (p. 30).

The theoretical framework of constructivism, framing learning as something that is not merely received but rather negotiated, and influenced by factors beyond merely the biological makeup of the student and the knowledge base of the teacher, necessitates that researchers attend to the multitude of factors involved in classroom climate when trying to determine how to help students learn best. Chapter Three will more thoroughly explore definitions of “classroom climate”, but for now I will define the phrase as the “physical and social properties of a classroom and school environment that provide the context in which learning takes place.” For social constructivists, this context is more than just background setting; rather, students’ learning derives *from* the continual interaction with their context.

Before that, however, Chapter Two will take a brief tour of Vygotskian social constructivism in particular, touching as well on the arguments of some of its critics. It will then address some contemporary studies and theories of the role of school climate in student learning and achievement. Finally, it will try and apply this research to issues of school safety as well as school achievement: *If* knowledge is constructed and dependent

on certain climactic factors, then what is the affect on achievement when those climatic factors are some of the same ones that are conducive to peaceful and peaceable environments?

This entire set of questions is important in the face of the current social climate in the United States, which arguably has viewed public education as in dire need of improvement for the past twenty-five years. The 1983 report of President Ronald Reagan's National Commission on Excellence in Education, *A Nation at Risk*, touched off a wave of attempts to address perceived failures of public education through reforms involving increased standardization in instruction. This trend persisted and in 1994, the US Congress set the National Education Goals, articulated in terms of standards-based education reform, based on the principles of "outcomes-based education". Outcomes-based education is a

definition of education that shifts from the traditional focus on what students should be taught (content) and how much time they should be taught it for, to a focus on setting universal standards of what students are expected to demonstrate they "know and are able to do". The traditional model that some students would be tracked for success while most others would be tracked elsewhere is rejected in favor of continuous improvement, and success "for all" students...all definitions and names for standards based reforms share an emphasis on setting clear...higher standards, and observable, measurable outcomes. Crucial is the belief that all students can learn, which means students of all abilities, all social racial and ethnic groups, and genders, sometimes disabilities as well. (McNeir, 1993)

These definitions of achievement were enshrined by the 2001 No Child Left Behind Act (NCLB), which among other things mandated each state create new (or enshrine existing) learning standards, on the basis of which all students must be assessed through standardized tests in order to graduate. Critics (for example, Heney, 1999) argued that, in practice, this would mean that "skill and drill" instruction geared towards test performance would replace true comprehension and mastery of the material. According to the Center on Public Education (Trickey, 2006), NCLB's implementation

caused 71 percent of the districts CPE surveyed to cut back on instructional time for subjects that were not immediately related to the reading and math skills covered on the tests.

Similarly, the way in which Educational research assesses the efficacy of educational practices has also become more narrowly defined. The National Research Council (Shavelson & Towne, 2002) makes a detailed and compelling call for standardization and rigor in educational research, apparently seeking to bolster the credibility of a field they describe as being “plagued by skepticism concerning the value and validity” of its scientific methods (p. 13). In a political climate that demanded quantitatively measurable results, the NRC called upon educational researchers to develop and implement their work in “clear, unambiguous, and empirically testable terms...linked through a chain of reasoning” (p. 18) The NRC claimed to be responding to a public that “seek[s] trustworthy, scientific evidence” and “a working consensus about what works in what contexts and what doesn’t, and on why what works does work” (p. 22).

While they may have the best of intentions, administrators and policymakers nationwide appear to have responded to the admonitions of the standards-based movement with an increasingly standardized set of instructional practices. A host of studies (many of which are summarized in Sunderman, Kim, & Orfield, 2005, Rose 2004, Fairtest, 2003) have demonstrated that student learning has not substantially improved in the wake of outcomes-based reforms, especially among poor and minority students nationwide. A strategy of increasingly standardized math and reading instruction, supplemented by even more hours of standardized instruction if students fail the assessments, seems to have limited ameliorative effects.¹ Jonathan Kozol presents South

¹ Furthermore, as an unintended consequence of the standardization renaissance, argues Mandel (2006), new teacher retention has suffered. “Since No Child Left Behind was enacted, school districts have felt forced to focus solely on testing...consequently, nearly every decision at the local school level involves ‘teaching to the standards.’ This excessive focus on testing and standards has led to a lack of focus on the practical guidance and support that would help first-year teachers stay afloat” (p.66) If, as this paper will subsequently argue, changes in school climate and

Bronx school P.S.#65 as emblematic of the failures of how schools have responded to the standards-based call, a school where:

...fifth-grade teachers had to set aside all other lessons for two hours of the day to drill the children for their tests for three months prior to exams...On top of this, two afternoons a week, children had to stay from 3:00 p.m. to 5:00 p.m for yet another session of test-drilling, and on Saturdays they had to come to school again for three additional hours of the same routine during the final four weeks just before exams....*Nobody believed test-drilling was of educative worth. Its only function was to...defend the school from state or federal punishments*" (Kozol in *NEA Today*, 2007, Emphasis mine)

Part of the problem may lie in the ironic incompatibility between these methods of instruction and *type* of learning that the outcomes-based movement wants students to experience. If we just wanted students to recall facts and figures, these instructional methods might serve, but interestingly enough, an earlier NRC publication (Bransford et al, 1999) offers a challenge to the idea that our schools are unable to provide that type of education: "In many cases, schools seem to be functioning as well as ever, but the challenges an expectations have changed quite dramatically (e.g., Bruer & Resnick, 1987)" (p. 119-20). While schools originally were designed to prepare their graduates for efficiency in factory or clerical style standardized tasks, the demands of today's job world require students to "understand the current state of their knowledge and build upon it, improve it, and make decisions in the face of uncertainty" (Talbert and McLaughlin, 1993 in Bransford et al, 1999, p.120) This need for problem-solving and "adaptive expertise", recognized by the outcomes-based movement, seems to fit well with the higher levels of Bloom's Taxonomy of the Cognitive Domain wherein students must not only recall and translate data but use it in new applications, distinguish its organizational

environment affect student learning, then the lack of consistency caused by high teacher turnover may actually harm student performance, an ironic result given NCLB proponents' intentions.

structure, build new structures and evaluate that work (Bloom, 1956). Standardization, by its very nature, would seem to preclude this sort of “adaptive expertise.”

What is there to do? When Shavelson & Towne announce that they categorically “reject the postmodernist school of thought” (p. 24) simplistically defining that epistemology as one that “posits that social science research can never generate objective or trustworthy knowledge”, they may unwittingly ignore theories like social constructivism. In their resistance to approaches that focus on idiosyncratic community conditions (and that therefore, in their view, lack broad generalizability), they risk cutting themselves off from the very tools that social scientists have developed during the last thirty years in recognition of the complex, dynamic nature of the fields they study, tools which could address many of the socio-cultural and environmental issues that hamper students learning and interfere with high achievement.

Chapter Three of this paper will argue that discomfort, alienation and violence, both in the immediate community and in the national/global culture of war, terror and fear, interfere with student learning and achievement, while communities where students are safe, create and maintain cooperative communities in and outside of school, and reflect meaningfully on their learning are those in which they learn and achieve at higher levels. By focusing on adjusting and responding to these climate issues, teachers and students alike may be able to improve the very skills that outcome-based education asks of them.

More than just this definition of achievement is at stake, however: As the Center for Education Reform (CER) argues:

Despite this country's mostly admirable utilitarianism when it comes to education, good education is not just about readiness for the practical challenges of life. It is

also about liberty and the pursuit of happiness. It is about preparation for moral, ethical and civic challenges, for participation in a vibrant culture, for informed engagement in one's community, and for a richer quality of life for oneself and one's family...the decisions we make about education are really decisions about the kind of country we want to be; the sort of society in which we want to raise our children; the future we want them to have; and even-and perhaps especially-about the content of their character and the architecture of their souls. (Allen, et al, 1998)

Could the right kind of school climate address both the outcome-based critics desires and those of the CER? Strong basic skills and competencies, as well as the socio-emotional competencies that the CER poetically terms the “content of their character and the architecture of their souls”? The social constructivists’ answer is yes. It has

II. Social constructivism, Vygotsky and beyond: Theories and critical responses

Lev Vygotsky (1836-1934) was a Russian Jew whose desire to be a teacher was squelched by the Czarist restrictions on Jewish employment (Hansen-Reid, 2001). He instead became first a doctor and then a lawyer. Later, in the post-revolutionary USSR, Vygotsky began an academic career at the Institute of Moscow that culminated in 270 scientific articles, numerous lectures and 10 books, many of which pointed to social and cultural factors which he believed influenced the development of thought, language and learning. Premier Joseph Stalin banned Vygotsky's work two years after the theorist's death from tuberculosis on the grounds that it was not compatible with the dominant visions of Marxism, but the ban was lifted upon Stalin's death in 1953. By 1962 Vygotsky's work became readily available outside the Iron Curtin.

Even behind such a barrier, Vygotsky was not functioning in a vacuum, nor was he the first to develop theories of socio-cultural influence on education. Vygotsky was well versed in both Piaget and Sapir and Whoorf (between whose theories he attempted to situate his own). He had also read John Dewey's critiques of memorization, drill and practice based education in the United States, particularly Dewey's advocacy for an education rooted in a child's own experience, interests, and motivations (indeed, Dewey was even invited to Russia in 1917 to advise the nascent Soviet school system), not to mention Hegel and Kant (Stokes, 2007). Indeed, it is in responding to all of these theorists, particularly Piaget, that Vygotsky distinguishes himself and his own ideas about education, which pave the road towards contemporary theory on the importance of school climate.

Vygotsky's initial arguments in his first book, *Thought and Language*, involve refuting Piaget's claims that climate – or indeed, any environmental experience whatsoever – has no effect on a child's learning. According to Vygotsky (1962), Piaget's

"experiments led him to believe that the child was impervious to experience" (p. 23).

Piaget constructed a series of stages through which a child progresses, many of which he spends in an "egocentric" state, apparently uninfluenced by the outside world, proceeding along an individualized biological timetable. Piaget (1923) writes that "the child never really and truly comes in contact with things, because he does not work. He plays with things, or takes them for granted" (p. 269). Vygotsky disagrees, claiming that these Piagetian stages "are not laws of nature but are historically and socially determined." He continues, citing other contemporary critics, that:

[Piaget] has already been criticized...for his failure to sufficiently take into account the importance of social situation and milieu. Whether the child's talk is more egocentric or more social depends not only on his age but also on the surrounding conditions (p. 23)

In *Mind and Society* (Vygotsky, 1978), Vygotsky resists the Piagetian assumption that

processes of child development are independent of learning [and that] learning is considered a purely external process that is not actively involved in development...merely utiliz[ing] the achievements of development rather than providing an impetus for modifying its course (p. 79)

Vygotsky argues that "the conception of maturation as a passive process cannot adequately describe these complex phenomena. Nevertheless... our approaches to development we continue to use the botanical analogy in our description of child development" (p. 20). Despite the usage of such terminology like "kindergarten", says Vygotsky, humans are not plants, not passive slaves to a predetermined schedule of development: "A child's perception," he writes, "because it is *human*, does not develop as a direct continuation and further perfection of the forms of animal perception, not even of those animals that stand nearest to humankind" (31)

As a linguist, Vygotsky used the arena of language development in which to challenge previous theories of development. Piaget, for example, believed that language began as internal speech and worked its way outward to social speech, while Vygotsky contended that *all* speech is social, and internal speech is social speech that is eventually internalized. Vygotsky highlighted the influence of external factors:

Essentially, the development of inner speech depends on outside factors; the development of logic in the child, as Piaget's studies have shown, is a direct function of socialized speech. The child's intellectual growth is contingent on his mastering the social means of thought, that is, language... The later stage (inner speech to verbal thought) is not a simple continuation of the earlier. *The nature of the development itself changes*, from biological to sociohistorical. Verbal thought is not an innate, natural form of behavior but is determined by a historical-cultural process and has specific properties and laws that cannot be found in the natural forms of thought and speech (p. 51)

Vygotsky's theories of language, of course, predate those of Noam Chomsky and the transformational theories of grammar that follow, but the influence of historical-cultural systems in learning is one that continues to inform contemporary constructivist theory. Contemporary constructivists also know not to misread Vygotsky's words – “determined by a historical-cultural process”² – as Vygotsky arguing for some sort of complete social determinism in human development. Vygotsky scholar Harry Daniels (Daniels, 1996) recounts how:

...much of the work in the West has tended to ignore the social beyond the interactional and to celebrate the individual and mediational processes at the expense of a consideration of the socio-institutional, cultural, and historical factors. Ideological differences between the West and East have given rise to differences in theoretical development and of course pedagogical application (p. 9)

² Even more inflammatory to a Cold War era Western audience might be Vygotsky's assertions later in that same chapter about how the development of human speech is “governed essentially by the general laws of the historical development of human society” (p. 51). Ironically, despite these echoes of Marx here and elsewhere that made Vygotsky so unpopular in the West, Premier Stalin judged Vygotsky's work to be in such *insufficient* keeping with the principles of Communism so as to be stricken from publication.

Even in a post-Cold War era, a certain discomfort appears to remain in the West with theories that do not place the individual in a privileged position of agency *vis a vi* the social. A recent article (Blunden, 2006) notes how several contemporary critics (Billett, 2006, p. 53 and Stetsenko, 2005, p. 70), “have touched on the issue of the need for psychology in general, or Cultural-Historical Activity Theory in particular, to better reflect the capacity of individuals to exercise genuine agency alongside larger social forces.” Blunden worries that:

Failing a more *critical appropriation* of the concepts of cultural and social formations involved in the constitution of consciousness, psychology risks erring in the direction of objectivism, casting individuals as creatures of the culture and institutions within which they live, minimising the way in which people create their own lives, inclusive of the culture and social formations which condition them.

Vygotsky, however, would be the last person to “minimize” the role in which individuals play in “creating their own lives” while interacting with culture. Furthermore, Vygotsky would likely not use the word “condition” – for Vygotsky, culture did not “program” individuals any more than individual biology proceeded absent of any cultural influence. In his understanding, the two factors engaged in a *dialectic*, a continual series of interactions which influenced one another. In the words of one Vygotsky scholar:

The issue [in Vygotskian theory] is not whether one should begin with cultural tools or with the individual. Instead, it is one of understanding the fundamental, irreducible tension between these two aspects of mediated action which are analytically distinct but inextricably connected in reality. On the one hand, cultural tools cannot play any role in human action if they are not appropriated by concrete individuals acting in unique contexts. On the other hand, we cannot act as humans without invoking cultural tools (Wertsch, 1993, p.170 in Daniels, p. 18)

A pair of contemporary Australian scholars (Liu and Matthews, 2005) also attempt to expose what they see as confusion among Vygotsky's detractors. Their thorough review of contemporary critics of constructivism comes to the same conclusion as Daniels above: that those critics by and large misunderstand Vygotsky and create a false dichotomy between individualism and social influence, a kind of "Cartesian dualism" which Vygotsky himself would have been the first to reject:

The irony now appears to be that from the divergence of constructivist views has emerged a dualist position – the very position constructivism came into being to avoid. By arguing for individual or social construction of knowledge a Cartesian parallelism between individual and social idiosyncrasy has arisen. This is most clearly seen in popular accounts of constructivists and their recent critics... the philosophical rigour underpinning Vygotsky's works has not been widely recognised in popular literature. We suggest that the historical-dialectical-monist philosophy characterising Vygotsky's theory is at odds with the dualist approaches inherent in many popular accounts of constructivism and their criticisms... confusions about Vygotsky's theory often arise from concepts taken literally and from the lack of appreciation of the general philosophical orientation underpinning his works (p. 386-7)

In short, they conclude that "popular literature on constructivism and its critical comments has tended to apply a dualist framework incongruent to the monist philosophy guiding Vygotsky's writings" (p. 389). Arguing about whether the individual or the social weighs in more heavily into the equation misses the point that for Vygotsky, the very act of that dialectic, of that mediation, is what matters.

Even a Piaget vs. Vygotsky dualism is in many ways a false one. Vygotsky notes how Piaget himself noted the interrelationship between student and instruction/environment:

[Piaget writes that] "nothing is more suitable to the technique of history teaching better than the psychological study of the child's spontaneous intellectual tendencies." But in the very same chapter an investigation of these spontaneous intellectual tendencies in children brings the author to the conclusion that what children's thinking really requires, is the same thing that makes up the basic goal

of history teaching, i.e. a critical and objective approach, and understanding of interdependencies and an awareness of relationships and stability (Vygotsky, 1934, in van der Veer & Valsiner, 1994, p. 364)

Piaget, however, interprets this relationship as one of “antagonism” between teaching/learning and development. For Piaget, a new or seemingly different idea puts the child in a state of disequilibrium, after which she either accepts it whole, accepts it with a modification, or dismisses the new idea entirely. Vygotsky “would counter...by putting forward another assumption which suggests that, so far as concept formation is concerned, not antagonism but relations of an infinitely more complex nature should exist between the processes of education and development” (365), a synthesis as opposed to an antagonism. The differences are this: for Piaget, a child with a new idea is either achieving victory, surrendering, or negotiating some compromised peace, seeking to remain in cease-fire until the next assault. For Vygotsky, the child perpetually exists at the negotiating table, with “battle lines” permeable and interchangeable, uniforms influenced by the fashion of the other side even as the battle rages.

This ability to synthesize is what separates humans from animals, according to Vygotsky’s work in *Mind and Society*, in that “the basic characteristic of human behavior in general is that humans personally influence their relations with the environment and through that environment personally change their behavior, subjugating it to their control” (p.51). In other words, animals do not alter their environment by creating signs and structures, which in turn shape a new environment which will in turn influence them. Humans do this, setting up the back-and-forth dialectic between self and society:

The mastering of nature and the mastering of behavior are mutually linked, just as man’s alteration of nature alters man's own nature...Just as the first use of tools refutes the notion that development represents the mere unfolding of the child's

organically predetermined system of activity, so the first use of signs demonstrates that there cannot be a single organically predetermined internal system of activity that exists for each psychological function. The use of artificial means, the transition to mediated activity, fundamentally changes all psychological operations just as the use of tools limitlessly broadens the range of activities within which the new psychological functions may operate (p. 55)

It is this very mediated activity that, for Vygotsky, permits learning and shapes development in academic settings. Just as Vygotsky does not accept Piaget's theory that learning and development are independent entities, neither does he believe that "learning is development" (p. 81), criticizing reflex theorists whom he says believe that both "occur simultaneously; learning and development coincide at all points in the same way that two identical geometrical figures coincide when superimposed." Neither still is he satisfied by the latter-day reflex theorists like Woodward and Thorndike who point to different development of different skill processes, or by Kofka and the Gestalt theorists who argue for learning as a generalized capacity to think, "an intellectual order that makes it possible to transfer general principles discovered in solving one task to a variety of others tasks".³

In Vygotsky's view, learning and development influence one another, and do so while both influencing and being influenced by the environment. Vygotsky relates in *Thought and Language* his disappointment with what he perceived to be the insular nature of his society's views on the development of children absent any theorizing about those environments in which they learned:

Most of the psychological investigations concerned with school learning measured the level of mental development of the child by making him solve certain standardized problems. The problems he was able to solve by himself were supposed to indicate the level of his mental development at the particular

³ To be fair, Piaget includes parts of this idea in his idea of formal thinking, but he and Inhelder alike said that it was not totally generalizable.

time. But in this way only the completed part of the child's development can be measured, which is far from the whole story (p. 103).

Vygotsky's own experiments focused on the role of one particular kind of social mediation – teacher intervention and assistance. What he called “the most essential feature of his hypothesis” based on this research was this: “developmental processes do not coincide with learning processes. Rather, the developmental process lags behind the learning process” (91). In other words, a child's biological capacity for performing certain tasks *limited*, but did not *define*, what that child could learn, thanks to the availability of social interactions. In his experiments he saw that, alone, students could seldom perform tasks too advanced for their age level. However, when a student was aided in tasks by a teacher or another individual with greater experience and problem-solving capabilities, then that student could perform some tasks well above those expected of his or her age level.

Having found that the mental age of two children was, let us say, eight, we gave each of them harder problems than he could manage on his own and provided some slight assistance: the first step in a solution, a leading question, or some other form of help. We discovered that one child could, in co-operation, solve problems designed for twelve-year olds, while the other could not go beyond problems intended for nine-year olds.

Vygotsky constructs from this research his now famous theory of the *Zone of Proximal Development*, which he defines as “the discrepancy between a child's actual mental age and the level he reaches in solving problems with assistance.” His research indicated that “the child with the larger zone of proximal development will do much better in school.”⁴

It is not merely that instruction can help a child learn more than she could otherwise. For Vygotsky, *all* learning takes place because of the instructional/biological

⁴ For a discussion of how this theory intersects with contemporary neuro-biological understandings of the building of neural capabilities through modeling and practice, see Brandsford et. al., 1999)

relationship. In his experiments, he continually introduced “problems” and “complications” into the assigned tasks, and noted how the interference and the interplay between the children and the problems led them to develop new lines of thinking. The idea of the development of high-level concepts happening on some preplanned biological timetable seemed absurd to Vygotsky. He concluded that “concepts are always formed during a process of finding a solution to some problem facing the adolescent’s thinking process” (Vygotsky, 1931, in Van der Veer & Valsiner, 1994, p. 257)

All of this reinforces the basic social constructivist idea, which Vygotsky articulates in *Mind and Society*, that “human learning presupposes a specific social nature and a process by which children grow into the intellectual life of those around them” (p. 88). Animals, says Vygotsky, can imitate, but they can never *learn*, because learning requires the kind of two-way social and environmental interaction of which only humans are capable.

It is upon these products of Vygotsky’s theories that much of school climate research seems to be based, the idea that, when certain conditions (a certain kind of teacher-student or student-student interaction, or certain physical classroom arrangements) are present, a child is capable of learning more (and perhaps achieving higher scores on learning assessments) than when other conditions are present. While this may seem like a self-evident idea to many classroom teachers who can bear daily testament to the effects on their classes of, say, the presence or absence of a particularly disruptive student, or of a helpful assistant teacher, the more complex nature of these interactions is not generally understood or explored in education policymaking.

Two contemporary social learning theorists (Lave and Wenger, 1991) note that

[t]ypically, theories, when they are concerned with the situated nature of learning at all, address its sociocultural character by considering only its immediate context the activity of children learning is often presented as [merely] located in instructional environments and as occurring in the context of pedagogical intentions whose context goes unanalyzed...[but] "locating" learning in classroom interaction is not an adequate substitute for a theory about what schooling as an activity system has to do with learning. (p. 147-8)

They argue that:

if participation in social practice is the fundamental form of learning, we require a more fully worked-out view of the social world... about the sociocultural organization of space into places of activity and the circulation of knowledgeable skill; about the structures of access of learners to ongoing activity and the transparency of technology, social relations, and forms of activity; about the segmentation, distribution, and coordination of participation and the legitimacy of partial, increasing, changing participation within a community; about its characteristic conflicts, interests, common meanings, and intersecting interpretations and the motivation of all participants vis-a-vis their changing participation and identities... (148)

This is key to School Climate research, which attempts to do just what Lave and Wenger suggest: to examine structures, spaces, circulation, transparency, social relations, and all of the other seemingly external factors that, according to Vygotsky and his successors, all play a role in the acquisition of knowledge in that they mediate, engage in a dialectic with, whatever the individual brings from his or her own biological and "personal" bag of tricks. A change in these climactic factors in a classroom or community could, in a constructivist view, change the learning and achievement of the students within.

School climate research studies interactions between students and their environment, both with inanimate factors and particularly between students and between students and teachers. Vygotsky (Vygotsky, 1934, in van der Veer & Valsiner, 1994) maintains that "concepts do not simply represent a concatenation of associative connections assimilated by the memory of an automatic mental skill, but a complicated

and real act of thinking which cannot be mastered by simple memorization”, and considers the idea that “a child acquires concepts in their finished state during the course of his schooling” to be “totally inadequate” (p.356). Vygotsky had harsh words for the kind of “skill and drill”, non-interactive approach that Dewey so harshly criticized in the United States, calling it “the replacement of the acquisition of living knowledge by the assimilation of dead and empty...schemes, represent[ing] the most basic failing in the field of education” (p. 357) Vygotsky believed that, because of the Zone of Proximal Development, children really *learned* concepts through problem solving, aided by teachers and fellow students.

In the century since Vygotsky’s experiments, many latter-day researches have found supporting evidence for his ideas. The American psychologist Jerome Bruner, for example, adapted much of his theories about “scaffolding” (the ability of teachers to aid student learning through support and brokering of complex concepts) from Vygotsky’s ZPD (Stokes, 2007). This paper cannot do justice to all of the researchers who have experimented with these ideas, but will list a few to give a sampling of the diversity of realms in which the ZPD has been explored and tested in the contemporary era: Students utilizing the ZPD in the form of “peer social dialogue integrated with teacher support” showed improvement in word recognition, fluency, and self-evaluation (Dixon-Krauss, 1995). (Aljaafreh & Lantolf, 1994) outline the supporters and detractors of the ZPD as applied to the use of negative feedback in acquiring a second language. (Salomon, Globerson, & Guterman, 1989) found that computer-based learning tools can serve to create a ZPD which resulted in increased reading comprehension scores for 7th graders. The ZPD has been applied to so-called “moral education” and character development

(Tappan, 1998) in children, and the ZPD has been shown to benefit adults, such as science teachers who participated in constructivist-based graduate-level methods courses (Jones, Rua & Carter, 1998).

One researcher (Hedegaard, 1990) concluded that

The zone of proximal development must be used as a tool for class instruction. In our teaching experiment, we saw that it is actually possible to make a class function actively as a whole through class dialogue, group work, and task solutions. The teaching experiment differed from traditional instruction in that the children were constantly and deliberately forced to act. The children's research activity was central in these guided actions, which gradually led the children to critical evaluations of the concepts.... (p. 191-2)

However, as a walk through many classrooms in the contemporary United States might reveal, especially in light of the recent trends in outcome and standards-based education discussed in my introduction, rote memorization and drilling in schools, if it ever left, has made a comeback. See Liu and Matthews for a tour of research that supports and advocates for such structures, including how:

Fox (2001) observed that in its emphasis on learners' active participation, it is often seen that constructivism too easily dismisses the roles of passive perception, memorisation, and all the mechanical learning methods in traditional didactic lecturing. Other researchers (Biggs, 1998; Jin and Cortazzi, 1998) have noted that while constructivist teaching approaches, including one-to-one or small group classroom interaction, do not always guarantee teaching effectiveness, traditional didactic lecturing in large classes of 50 to 70 students in China has not always meant the doom of teaching efforts.

A constructivist would argue, however, that none of these cases can be examined absent the conditions in the classroom and society at large. The very fact that large class lectures succeed in the studied communities in China⁵ where they do not in my school in Massachusetts indicates that other factors influence learning. Therefore, a teacher that does not capitalize on interaction limits his or her ability to teach, surrendering to the

⁵ Although I question to what degree (in terms of Bloom-taxonomic-level) of understanding they succeed.

conditions of the time and ignoring the facts that #1) those conditions play a role in their student's learning, and that #2) those conditions are alterable, and some alterations could conceivably improve their students' acquisition and development of skills and concepts.

Part of the contemporary backlash against such ideas may stem from a perception that, until the 1990s, constructivist theories dominated educational discourse. According to one critic (Phillips, 1995):

Across the broad fields of educational theory and research, constructivism has become something akin to a secular religion. ... constructivism, which is, whatever else it may be, a "powerful folktale" about the origins of human knowledge. As in all living religions, constructivism has many sects – each of which harbours some distrust of its rivals. This descent into sectarianism, and the accompanying growth in distrust of nonbelievers, is probably the fate of all large-scale movements inspired by interesting ideas.... (p. 5)

Good, et al (in Tobin, 1993) similarly caution that constructivism will only prove useful in science education when there is "a confrontation with the real differences that exist among different constructivisms" (p 84).

The exploration of such differences and "sectarian rivalries" is not relevant, however, to this paper. Most of the debate appears to take place on very abstract epistemological levels that do not seem to differ on the basic principles discussed already in this paper. While there are indeed some more radical social constructivists – for example (Elkonin, 1971 and Aries, 1982 in Hedegaard, 1990), who argue that childhood itself is a social construction, that children before the 18th century were treated as and thus behaved like little adults, and that much of what we think are biological stages of development are in fact socio-historically determined - more moderate constructivists, (not to mention contemporary brain researchers) upon whom this paper builds its framework, (Hedegaard, 1990), merely point out that

Although each child is unique, children obviously share common traits with other children...a child is unique and individual, but children's individualities have common features. If these features are not developed, we tend to regard the child as deviant.... (p. 191,2)

Far from Phillips' fear of an orthodoxy that persecutes heretics, Hedegaard characterizes constructivism as a way in which to make sure individual children are *not* ostracized and marginalized. In Hedegaard's words:

To work with the zone of proximal development in classroom teaching implies that the teacher is aware of the developmental stages of the children and is able to plan for qualitative changes in the teaching towards a certain goal. Being of the same tradition, children in the same class have a lot of knowledge and skills in common. Instruction can build upon these common features if it takes into account that children vary in their speed and form of learning. (p. 191)

For one final time, constructivism of the Vygotskian school does not argue that individuality or biology has no place plays no role, not even in its more extreme (and least palatable to critics) forms like Wenger's *Communities of Practice*. In this book, Wenger argues that individual identity development itself cannot be extricated from the social: "We cannot become human by ourselves", he writes, and "hence a reified, physiologically based notion of individuality misses the interconnectedness of identity" (p. 146). Even here, Wenger does not deny individuality as a concept, but rather that "it is a mistaken dichotomy to wonder whether the unit of analysis of identity should be the community or the person. The focus must be on the process of their mutual constitution."

This paper will not go as far as to present all students as socio-community "units", but it must be understood that the paradigm it employs is one that refuses to recognize a child as an island unto herself. Her learning and development in class is no more dependent on inalienable, individual qualities as it is completely determined by her socio-

historical context – rather, in Vygotskian fashion, it is the product of the interactions and interplay between the two.

Contemporary neuroscience (Bransford et al, 1999) yields physical evidence that brain activity during learning happens in an extremely complex fashion, in several different areas (the development of declarative knowledge, for example, produces recordable effects in the hippocampus, while procedural knowledge manifests as activity in the neostriatum). In short, “research has...indicated that the mind is not just a passive recorder of events, rather it is actively at work in both storing and in recalling information” (112). Recall, for example, is affected by environmental conditions and stimuli, and can be enhanced or befuddled with the right environmental prompts. More interesting still from a Vygotskian perspective, “there is growing evidence that both the developing and mature brain are structurally altered when learning occurs” (114). The individual’s brain and neurological pathways undergo physical, measurable change during the learning process, change that varies depending on the stimuli during learning.

Another possible reason why constructivist ideas might be unsettling enough to lead to continued misunderstanding of dialectical theory, according to Daniels (Daniels, 1996), may be because

the very idea of mediation carries with it a number of significant implications concerning control. In that the concept denies the possibility of total control through external or internal forces it carries with it intellectual baggage which is potentially highly charged, especially in the political context in which these ideas were promulgated (p. 7)

The role of teacher, according to Paulo Freire, is not to control, but to recognize the power of *mutual* influence. As he explains in *Pedagogy of the Oppressed*, a teacher who recognizes this “is no longer merely the-one-who-teaches, but [also] one who is himself

taught in dialogue with the students, who in term while being taught also teach. They become jointly responsible for a process in which all grow” (67). As we will shortly examine, School Climate research seeks ways to exploit that partnership for the benefit of students and teachers alike.

III. School Climate Research

This paper has been using the phrase “School Climate” but as of yet has not defined it in any terms beyond its status as being informed by constructivist ideals. The New York based Center for Social and Emotional Education, founded in 1996 at Teachers College, Columbia University (CSEE, 2007) offers the following definition of school climate:

Although researchers and practitioners use somewhat different dimensions (e.g., the “tone” or “atmosphere” of the school), virtually all agree that school climate refers to the quality and character of school life...[it is] based on patterns of students’, parents’, and school personnel’s experience of school life and reflects norms, goals, values, interpersonal relationships, teaching and learning practices, and organizational structures.

Sackney (1988) offers a thorough tour of various articulations of school climate in the Canadian literature, where the discipline seems to have evolved not only from educational but also business/organizational contexts, and various models include everything from physical ecology to social milieus to group-subcultures and “we feelings” to overall “school ethos.” Sackney’s own monograph settles on the following definition:

...a relatively enduring quality of the internal environment of the school that: (a) is experienced by the members (students, teachers, administrators, secretaries, consultants and custodians), (b) influences their behavior, and (c) can be described in terms of the values, norms and beliefs of a particular set of attributes of the school.

Even with such broad definitions, how much does School Climate even matter at all in terms of student achievement? The constructivist view, which sees a continual dialectic between individual and social/environmental conditions as the locus for learning, would of course say that environment is a vital part of learning, but who is to

say that the influence of *school* environment holds any weight in the face of, for example, family environment or racial/ethnic heritage? Good and Weinstein (1986) contend that “research shows that the school a student attends can make a substantial difference in the education received; schools are not interchangeable” (p. 1090) They rebuff critics (specifically Averh, Carroll, Donaldson, Kiesling & Pincus, 1974) who say there is insufficient evidence to connect resources and other inputs to a school with student outcomes, arguing instead that “the utilization of resources was far more important than the level of resources available.” In other words, what a school *does* with its resources, the specific climate it creates, is what must be examined in terms of correlation with student achievement. In their own survey of studies, they conclude that “variation in achievement among schools serving similar populations is often substantial and has significant implications for school policy” (p. 1096). Literature from the UK also supports this idea: for example, a three-year longitudinal study of secondary schools in London and Isle of Wight in the 1970s (Rutter, et al, 1979) concluded that

Children’s academic attainment was...strongly and consistently associated with school process influences, even after other variables had been taken statistically into account (p. 175)

In the past 30 years, a host of studies have emerged affirming that “school climate is thought to be linked to educational outcomes, especially achievement” (Pallas, 1988, p. 541). Norris, Emmons and Ben-Avie (1997) list nine studies that correlate school climate and achievement, while Cohen, et al. (2007) cites five studies not listed in Norris, et al’s article. According to Norris, et al, this research is empowering in the face of socially deterministic theories, especially involving poor and minority students who some policy makers would suggest are doomed, educationally speaking, in any scenario that does not

involve the radical alteration of their socioeconomic conditions. Seeing connections between school climate and achievement allows us to focus “not only on student background and motivational factors but also on school context and the quality of interactions among and between students and teachers as explanations of student academic achievement” (p. 322). Several studies they cite, in fact indicate that school climate has a greater affect on African American student achievement than on that of White students. Freiberg, et al (1999) assembled a list of international contributors with data from the USA, UK, Australia and Holland which supports the idea that, “like a strong foundation in a house, the climate of a school is the foundation that supports the structures of teaching and learning.”

The next logical question then becomes, what *kinds* of socio/environmental conditions in school climate foster learning and achievement at high levels? As might be expected, “learning theory does not provide a simple recipe for designing effecting learning environments; similarly, physics constrains but does not dictate how to build a bridge (e.g., Simon 1969)” (Bransford et al, 1999, p. 119)

This section of will outline several research-based theories as to the characteristics of instruction in successful learning environments. “Success” here will be addressed both in terms of the outcome-based standards of increased achievement on standardized assessments, and in the CSEE model, where “a sustainable, positive school climate fosters youth development and learning necessary for a productive, contributing and satisfying life in a democratic society.” There is no dichotomy necessary here regarding those two definitions of success, as school climate theorists would argue (as we shall see) the latter is a precondition for the former.

The ways in which I have chosen to parse the data are as follows:

1. Environments that create and reinforce comfort and safety
2. Environments that involve cooperation and connection within school communities
3. Environments that encourage connection with communities and ideas beyond the classroom
4. Environments that stimulate and encourage metacognition, “thinking about one’s thinking”

I argue that these are not separate categories, but components of a greater whole, and indeed one component enables and reinforces another in feedback loops: cooperative classrooms generate the kind of connectedness that makes for emotional comfort and feelings of acceptance. Physical safety is a prerequisite for cooperative environments, which can in turn create more physical safety. Connectedness with communities outside the classroom create the kind of relevance that motivates and engages students, and makes worthwhile the acts of metacognition, which can help students reflect on the processes that create all of these environmental conditions and refine them, reinforcing the whole system.

First, however, I will break them down into component parts for easier examination:

1. Comfort and Security

Comfort and security, both physical and emotional, seem to be commonly held conceptions of what constitutes the kind of school climate that promotes learning and high achievement. The grounding for this theory could be said to begin with Maslow (1943) and his theory that human beings have a hierarchical set of basic needs which must be progressively satisfied before they can address “higher” needs. In Maslow’s view, a person’s “deficiency needs” for physiological satisfaction (food, water, sleep,

basic homeostasis) and safety from physical or emotional harm must be met before addressing any higher-order, “growth” needs like learning complex declarative and procedural knowledges in a classroom.

These ideas are supported in subsequent research on school climate: Marzano, et al (1997) have collected a body of research that supports the idea that “A student’s sense of comfort and order in the classroom affects his or her ability to learn. Comfort and order as described here refer to physical comfort, identifiable routines and guidelines for acceptable behavior, and psychological and emotional safety” (p. 23) Their definition of “comfort” is a wide one, beginning with the physical conditions around them:

A student’s sense of comfort in the classroom is affected by such factors as room temperature, the arrangement of furniture, and the amount of physical activity permitted during the school day. Researchers investigating learning styles (e.g., Carbo, Dun and Dunn, 1986 ; McCarthy, 1980, 1990) have found that students define physical comfort in different ways. Some prefer a noise-free room; others prefer music. Some prefer a neat, clutter-free space; others feel more comfortable surrounded by their work-in-progress” (p. 23)

The recommendation in this review, as in elsewhere (NASSP, 1996), is that “the physical setting of a high school should nurture a student in much the same way that the clean, safe interior of a home makes the youngster feel comfortable and secure” (p. 34)

Security derives from more than just the physical plant. A host of studies demonstrate that students in violent school settings perform more poorly than students in safer settings. Below are a sampling:

Coleman (1998) analyzed base-year student data files from the 1988 National Education Longitudinal Study cross-sectionally to identify relationships between school violence and student achievement in reading and mathematics. The study addressed variables including school type (public/private, urban/suburban/rural) and racial/ethnic

composition, and examined various types of violence: physical conflicts, verbal abuse, robbery/theft, vandalism, possession of weapons, substance abuse, and teacher-related violence. Coleman found that “when the incidence of negative personal behavior increases, there is a negative effect on achievement. Students experiencing victimization and students' perceptions of violence in their schools show lower levels of effect on achievement” (p. 7).

Gronna and Chin-Chance (1999) present their own literature review, which I excerpt from here, of additional studies:

Furlong and his colleagues (1995) found that students who had been victims of violence had lower grades and higher levels of perceived danger within schools than their non-victim peers. The researchers suggest that high levels of school violence may have a "generalized retarding effect on a child's development and overwhelm coping and protective factors naturally present in the student's life" (pp. 294-295). Kimweli and Anderman (1997) concluded that students enrolled in violent schools are exposed to unpredictable events not under the student's control and found that smaller schools had lower levels of violence. Based on the finding that extreme violence has been found to hinder cognitive, social, and emotional development (Furlong et al., 1995; Harris, 1995; Prothrow-Stith & Quaday, 1995), one can argue that an unsafe environment would hinder academic achievement. In more violent schools, students have less time to focus on academic activities as they are concerned about other factors and personal safety issues (Kimweli & Anderman, 1997; Prothrow-Sith & Quaday, 1995) (p. 3-4)

Heinrich, et al (2004) also cite six additional studies not in Gronna and Chin-Chance's list that “indi[cate] that children who report more incidences of witnessing and victimization by violence do less well in school” (p. 328). Finding much evidence in the literature that school violence correlates with lower achievement, but less evidence that a *safe* school correlates with *increased* achievement, Gronna and Chin-Chance conclude from their own study along these lines that

controlling for student background characteristics and differences in school conditions, students who are in safer schools have higher grade 8 achievement scores than students who are in less-safe schools. The results suggest that schools with lower levels of school violence provide better learning environments for students in middle-level schools (p. 2)

Grissmer, et al (1998) caution that while a rise in violent crime may correlate with decreased test scores for African American students, its importance must not be overstated, but rather taken in context with a multitude of other factors. The effect of school violence on achievement has been shown to change dependent on such variables as school size (Commission on Business Efficiency of the Public Schools, 2003), parental support or lack thereof and/or whether one is a witness to violence or a direct victim (Henrich, et al, 2004). (Schwab-Stone, et al 2003) argue that each form of violence exposure has its own particular outcomes. Still, there seems to exist a substantial body of evidence that violent environments hinder achievement.

The research shows that students require not only physical comfort and safety, however, but emotional and psychological safety, even beyond reducing the kind of anxiety and hypervigilance present in school communities plagued by violence.

Positive and “safe” school climates, however, must go beyond the simple absence of violence. They must continually reinforce norms of safety and consistency⁶.

Marzano, et al, 1997, among many others, reaffirms the idea that students learn best in environments with consistent routines: “research shows...that explicitly states and

⁶ There is a body of theory and research that maintains that, to service diverse populations, school communities must also reinforce norms of racial equity, multicultural appreciation, and *identity safety*. Claude Steele’s experiments with what he calls “stereotype threat” demonstrate that African American students’ academic success may be dependent on “trust that stereotypes about their group will not have a limiting effect on their school world” (Perry, Hiliard, & Steele, p. 122). The conclusion he draws from a variety of studies is that “underperformance appears to be rooted less in self-doubt than in social mistrust” (p. 124), and he calls for the creation of climates of “identity safety” to “weaken the sequelae of identity vigilance, mistrust [and] disidentification” (p. 125) that he feels lead to underperformance. Interestingly enough, his studies also show that White and female students suffer from stereotype threat, and benefit from climates where norms of fairness and equity are made explicit. In a subsequent qualifying paper I will take more time and care in exploring the ways in which race, gender, ethnicity and other factors influence school climate and classroom achievement, as such an exploration could not be properly conducted as merely a subsection in this paper.

reinforced rules and procedures create a climate that is conducive to learning. If students do not know the parameters of behavior in a learning situation, the environment can become chaotic” (p. 23)

Bransford, et al (1999) also views climate (they employ the term “environment”) as dependent on norms: “Different classrooms and schools reflect different sets of expectations...[and] different norms and practices have major effects on what is taught and how it is assessed.” These norms, in their analysis, include classroom management rules both explicit and implicit about speaking, asking questions, behaviors that are rewarded or punished, and paradigms of competition versus community. The analysis stresses the importance of factoring in how these norms interact with cultural norms in the students’ home or ethnic communities – in one of their examples, students bearing cultural identities which discourage distinguishing oneself from the crowd might experience public praise for their efforts as a hostile climactic factor, while a student from a different cultural background might not. Overall, they posit that, “at the level of classrooms and schools, learning seems to be enhanced by social norms that value the search for understanding and allow students (and teachers) the freedom to make mistakes in order to learn (e.g., Brown and Campione, 1994; Cobb et a, 1992)” (p. 133).

How are these norms established and reinforced? That is the subject of the next section.

2. Cooperation and Connection within School Communities

Among Maslow’s (1943) deficiency needs, which must be met before growth is possible, are the emotional/psychological needs for love, acceptance/belonging, and the respect of others in the community. School climate research also supports this idea:

“Students who feel accepted usually feel better about themselves and school, work harder, and learn better” (McCombs and Whisler, 1997, in Marzano, et al, p. 16). Whitlock (2006) examines the idea of *connectedness* through literature review and through his own research, concluding that students who feel “cared for, trusted and respected by collections of adults that they believe hold the power to make institutional and policy decisions”, exhibit better behavior and academic performance.

In sum, it appears that norms that reinforce acceptance and cooperation generate more positive school climates. From a Vygotskian perspective, this is not just a matter of making students “feel better” without any other positive result. Truthfully, we should be concerned with students’ psychological and emotional well-being even if it did not affect academic achievement, but it also happens to. Because of the ZPD and the interactional nature of learning, students who feel more comfortable together, who work more closely together in connected communities, are actually capable of more advanced learning than those who do not:

...the ZPD is useful to explain, at least in part, why the phenomenon of collaborative problem solving or inquiry-based activities makes sense. Emerging adolescents may begin to connect to one another’s thinking and to grasp concepts with the assistance offered by one of their more knowledgeable peers (Albert, 2003, p. 60)

Albert bases her analysis of cooperative learning not only on Vygotsky but his American successor Bruner, when he argues that

[a] true act of discovery is not a random event (Bruner, 1973). It is deliberate and intentional. The learning community in which it is embedded influences the activity of problem solving... (Albert, 59)

Definitions of “cooperative learning” vary, but most contemporary educational definitions seem to pay homage to the work of Roger Johnson and David Johnson at the University of Minnesota. According to Johnson & Johnson (1994), cooperative learning involves more than just students being together in a group. There must be what they call “positive interdependence”, which is

when students perceive that they are linked with group mates in such a way that they cannot succeed unless their group mates do (and vice versa) and/or that they must coordinate their efforts with the efforts of their group mates to complete a task...[t]here is a difference between simply having students work in a group and structuring groups of students to work cooperatively. A group of students sitting at the same table doing their own work, but free to talk with each other as they work, is not structured to be a cooperative group, as there is no positive interdependence.

Johnson & Johnson go on to specify that positive interdependence needs to be coupled with individual accountability for each student’s role in the group effort, as well group accountability for goals:

Each group member's efforts are required and indispensable for group success (i.e., there can be no "free-riders"). Each group member has a unique contribution to make to the joint effort because of his or her resources and/or role and task responsibilities.

To this end, Johnson & Johnson also list as prerequisites for true cooperative learning the development and usage of interpersonal and small-group skills for communication, coordination and conflict resolution within groups. Finally, *metacognition*, the act of reflection on/processing how the group works, must be employed regularly for ongoing improvement of the group’s functioning. This paper will further discuss metacognition later on.

So, in summary, cooperative learning as defined in this paper is

...an instructional paradigm in which teams of students work on structured tasks (e.g., homework assignments, laboratory experiments, or design projects) under conditions that meet five criteria: positive interdependence, individual accountability, face-to-face interaction, appropriate use of collaborative skills, and regular self-assessment of team functioning (Kaufman & Felder, 2000).

What does the research bear out regarding cooperative learning's effects on achievement? Baloché (1998) concludes that

When well-structured, learning goals that are designed to emphasize cooperation tend to promote higher achievement than learning goals that are designed to emphasize either individualism or competition. This is true in every subject, at all grade levels, and particularly when higher-level thinking skills are required (D. Johnson, Maruyama, R. Johnson, Nelson, & Skon, 1981). Cooperative efforts result in better performance in problem solving than competitive efforts do. This is true at all grade levels (Quin, D. Johnson, & R. Johnson, 1995)...learning that is structured cooperatively tends to increase achievement for all students, and achievement results are particularly potent for some groups who are more cooperative in their cultural and social orientations (Kagan, 1980, 1992)" (p. 3)

Putnam (1997) reaffirms this research by citing the "best-evidence synthesis" technique used by Slavin (1990) to examine 68 studies on cooperative learning. Slavin found that 49 of the 68 comparisons (72%) were positive, favoring the cooperative learning methods, and only 8 (12%) favored control groups (p. 31). She also cites Johnson & Johnson (1989), in which they use meta-analysis methodology to analyze 323 studies of cooperative work:

[T]he data indicate that achievement and productivity are higher when students cooperate than when they work individually or compete. The more methodologically rigorous the study was, the more powerful was the effect of learning on achievement" (32). More than 50% of the findings were statistically significant in favor of competition, and only 10% in favor of competitive or individualistic learning – average cooperator performed above (about 3/5 a standard deviation) the average person working independently or competitively (p.33)

Putnam does raise the caveat that most of this research has been conducted on lessons involving basic skills in spelling, math, and more research needs to be done on lessons involving advanced, higher order problem solving.⁷

Albert already described, from a Vygotskian/Brunerian perspective, a possible reason for the positive effect a cooperative climate on achievement. Baloché goes further to discuss how cooperative groups develop and reinforce norms values and roles, creating a psychologically beneficial climate as well as an academically beneficial one. Drawing on research, Baloché examines the different roles between “base groups” and “informal groups.” Base groups are those which are formed by teachers and administrators to establish consistent, helpful routines and positive norms. To be successful in promoting positive school climate, base groups should have stable, heterogeneous membership and meet regularly throughout the school year. Although Baloché doesn’t use the term “social capital”, she is essentially arguing that participation in these groups increases social capital within a school community.

Social Capital, a term coined by John Dewey (1900)⁸ and promulgated most recently by Robert Putnam’s book *Bowling Alone*, refers to “a sense of belonging and the concrete experience of social networks (and the relationships of trust and tolerance that can be involved) [that] can, it is argued, bring great benefits to people” (Field, 2003, “Social Capital”). As Beem (1999) presents it:

The central idea is that 'social networks are a valuable asset'. Interaction enables people to build communities, to commit themselves to each other, and to knit the social fabric...trust between individuals thus becomes trust between strangers and

⁷ She also cites studies that demonstrate that individualist approaches seem to work better than cooperate ones in some specialized cases, such as adult learners acquiring simple motor skills.

⁸ Pierre Bourdieu (1986) in *The Forms of Capital* is generally credited with the first use of the term in its modern definition, but the initial coinage remains Dewey’s.

trust of a broad fabric of social institutions; ultimately, it becomes a shared set of values, virtues, and expectations within society as a whole (p. 20)

In this case, the “shared set of values, virtues and expectations” are that “all children and adolescents, in all schools, have the right to believe that they are valued by peers – that peers notice and care when they come to school and that peers notice and care when they do not come to school. Base groups are one way to build a sense of inclusion, respect, appreciation, and community into classroom life” (Baloche, 1998, p. 95)

Baloche also speaks about the role of “informal cooperative learning groups”, the short term “communities” with random membership such as temporary discussion or activity groups that offer opportunities to bounce ideas off new people. What ties all of these groups together, she says, is Johnson & Johnson’s idea of positive interdependence, that we all share mutual goals, even if those goals, in a diverse community, are by necessity differentiated.

How can academic cooperation function given the reality of vast heterogeneity in student ability, even within so-called tracked classes. According to Putnam (1997) and Slavin (1990), differentiation is the key to successful cooperative learning environments. Slavin’s research concludes that successful cooperative learning must have equal opportunities for students at all levels to get points/rewards for improving – “one size fits all” doesn’t work. But research differs as to the best kind of heterogeneous grouping and the best. method of differentiation.

Putnam (1997) cites research that says low-performing students bring down the level of academic achievement in cooperative heterogeneous settings, yet they actually derived better social benefits (they are “liked more”) in cooperative settings than

competitive ones, even *if* they bring down the group attainment (p. 38) In terms of raising that attainment, she cites research (Jones & Carter, 1994) that shows that if the group task goals are designed so that each student can learn something from the exercise, then pairing high-low students can be beneficial for all (p. 38-39).

Mixed-ability grouping by itself, of course, is no panacea for low achievement.

As early as the Coleman Report of 1966, research suggested that, while

peer effects existed and were significant in shaping educational attainment – with students being seriously advantaged or disadvantaged depending on the quality of their fellow- classmates...it asserted, too, that those effects were non-linear – that the weak student benefited more from association with strong classmates than those strong students lost in associating with weaker classmates” (Zimmerman, Rosenblum and Hillman, 2004) (p.2)

Without careful design of groups, mixed-ability grouping can have negative social consequences as well:

Gifted students...often feel exploited when cooperative learning is used as a predominate method of instruction and groups are configured heterogeneously (Coleman, 1994; Mills & Durden, 1992; Robinson, 1991). Fiedler, Lange, and Winebrenner (2002) likewise believe heterogeneous grouping may have negative side effects both on the gifted student and on the others in the classroom. Average or low-ability students may see their "perceptions of themselves as competent, capable learners suffer" (Fiedler et al., p. 110) (All in Huss, 2006)

As is evident from this discussion, the kind of school climate involving cooperative learning which benefits achievement does not happen as a natural result of mixed-ability grouping: it requires specialized structures and skills which teachers must help students acquire. Yet Slavin (1995), after reviewing 99 studies on cooperative learning, reports that “it is possible to create conditions leading to positive achievement outcomes by directly teaching students structured methods of working with each other (especially in pairs)” (p. 45, in Putnam, p. 32).

3. Cooperation and connection with communities and ideas beyond the classroom

Bransford, et al (1999) stress the need to recognize the interfaces of that climate with the climate of students' greater communities (since, in their analysis, 53% of waking student time is spent outside of school vs. 14% in school). They also discuss the effect of television and other media as influencing "educating" forces, for good or ill, on student achievement and worldview. At all times, they argue, an awareness must be maintained, and inclusion practiced, of all of these influences beyond the classroom. One of four⁹ key "environmental" (climate) requisites in Bransford, et al for an academically successful is an environment that is learner-centered: "culturally responsive, culturally appropriate, culturally compatible, culturally relevant" (p. 122), where instruction is aimed at discovering what students think in relation to problems at hand, giving them situations to go on thinking about to further readjust their ideas. Teachers in learner-centered environments use "diagnostic teaching" to recognize the importance of, and to build upon, what the students bring to class, and then engage students in a cognitive conflict and then have discussions about conflicting viewpoints (echoing once again the Vygotskian problem-based style). Paulo Freire was well aware of this prerequisite when he conducted his literacy campaigns in developing nations, where he

adapted his educational methods to the specific historical and cultural setting in which his students lived [and thus] they were able to combine their "spontaneous" concepts (those based on social practice) with those introduced by teachers in instructional settings (John-Steiner & Souberman in Vygotsky, 1978, p. 131)

⁹ The two requisites not discussed here are that classrooms must also be *knowledge centered* (exposing students to a vigorous body of knowledge and not shying away from greater context of complex ideas) and *assessment centered* (providing regular, reliable, valid assessments that are not merely summative, but whose results students then apply towards improving their work).

Another requisite is that classrooms be what Bransford, et al call “community centered”, helping students to make connections with “experts” outside of school and the ability to share their work with others in the community:

Opportunities to prepare for [events that link school and greater community] helps teachers raise standards because the consequences go beyond mere scores on a test (e.g. Brown and Campione, 1994, 1996; Cognition and Technology Group at Vanderbilt, 1997; Wiske, 197) (p. 137)

The benefits of community-interactional service-learning have been well documented; see Dufour & Eaker (1998)’s best practices manual and Ward & Wolf-Wendel (2000)’s literature review. A great deal of literature also exists studying the developmental (and to a lesser extent, cognitive) benefits of service learning on college students (Astin, et al, 2000; Eyler, 2000)¹⁰

Even absent actual involvement in communities beyond the classroom, a sense of connection between classroom material the real world can reap benefits. Regarding math and science education in particular, Yager (1999) warns of the “a schism between the explanations offered in schools and those accepted and used by students”, and argues that “content comprising school programs must be related to the real world of students if it is to be useful.” He references others (Simpson, 1963; Perrone, 1994) to explain how “concern for mathematics and science in the real world can...exemplify the visions in our current national standards.”

¹⁰ The groundwork for these ideas goes back at least as far as Maslow when he talks about the higher-order needs to demonstrate competence.

4. Metacognition

Johnson and Johnson already detailed the importance of metacognition in the continual examination and maintenance of cooperative learning environments, which Albert reinforces in her own work:

In learning communities, metacognition encompasses awareness of what is to be learned, when and how it is to be learned, as well as self-knowledge of personal and intellectual qualities. The teacher scaffolds learning and understanding, gradually allowing the students to monitor and regulate their own learning of the material by deciding when to use a different approach or how to proceed to successfully complete a task (p. 59)

She draws upon Bruner (1973), who sees instruction as

...participat[ing] in the process that makes possible the establishment of knowledge. We teach a subject not to produce living libraries on that subject, but rather to get a student to think mathematically for himself, to consider matters as a historian does, to take part in the process of knowledge-getting. Knowing is a process, not a product (p. 72)

Metacognition has been recognized as a key element in defining what it means to have "expertise" in a subject (Sternberg, 2004). Research shows (Lucangeli & Cornoldi, 2000) that skills and achievement memory, reading, numerical and geometrical problem-solving abilities, and in a limited way, arithmetic, are related to metacognitive capabilities, as is spelling (Turner, D'Isa, 1993) and scientific research (White & Frederiksen, 1998). Some studies (Lucangeli & Cornoldi, 2000; O'Neil & Abedi, 1998) suggest that assessments of metacognition's affect on achievement grow more reliable when examining older students.

Drawing it all together

As has been mentioned before, it is no coincidence that all of these School Climate factors – safety, cooperation, real-world connections, and metacognition – are all

correlated positively with student achievement. All of these factors are interdependent with one another. The same skills that students develop in cooperative learning environments, in Baloché's view (Baloché, 1998), aid them in their interactions in the real-world beyond the classroom achievement. She cites research to support the benefits for improved skills in democratic participation, better relationships with peers, and better physical and psychological health...which in turn connects back to physical and emotional safety. Cooperation and the safety which is both necessary for it, and generated by it, is both maintained by and stimulates metacognition. All of these elements, in turn, enable the kinds of higher-order achievement that the outcomes-based movement desires of students.

The implications for my doctoral work of this interdependent system's positive affects on achievement are discussed in the final section of this paper.

IV. Conclusions: Questions and potential connections to Peace Education

It would be irresponsible to entirely dismiss the outcome-based education movement's calls for preparing our students with the skills, knowledges and problem solving approaches they need for the modern world which they will enter. On the other hand, it is equally irresponsible to keep plowing ahead with standardized instructional models that seem to poorly serve the students who most need to develop those skills, knowledges and approaches. At best, such models only focus our attention on one piece of a larger picture. So what models should be employed? A question that my work still needs to settle regards assessments: the multitude of studies cited and mentioned in this paper hardly share common definitions of learning and achievement, and the degree of their compatibility with the state-enshrined standardized tests will be vital in establishing their relevance in informing practical education policy. On the other hand, I may wish to establish later in my dissertation one or more alternate means of assessment, one which still meets the goals laid out by state and national frameworks but may perhaps be measurable in other ways besides currently employed standardized instructional practices. Whatever route I take, I will need to more specifically define "achievement". For the purposes of this paper, "achievement" means various kinds of attainment as according to various study standards. Specifically, this breaks down into one of three types of standards:

- 1) Attainment in grades earned in existing classroom assessment measurements in each classroom or school of student (potentially useful, but difficult from which to generalize)

2) Standardized test scores (more easily generalizable, but by their nature less permeable to change from any one experimental classroom intervention).

3) Attainment on instruments designed by the researcher (highly variable).

With this significant caution in mind, however, given how the experimental interventions cited in this paper showed increased attainment through one or more of these assessment methods, one can say with some confidence that there is *some* measure of positive correlation between certain school climates and student achievement. When schools establish norms that promote safety, cooperation, connection with the larger community and metacognition, they succeed in school (even if that success is measured by a variety of standards). In other words, students' academics improve in some way, shape, or form when they are safer, see each other and the greater world as cooperative partners, and think critically about their actions. This list of factors sounds remarkably similar to those that the discipline of Peace Studies includes in its definition of "positive peace". "Positive peace" (Lieber, 1994) is not merely the absence of war but the creation and maintenance of a safe, just, cooperative society. Lesley University's Center for Children, Families, and Public Policy (formerly the Center for Peaceable Schools) bridges this disciplinary gap explicitly:

Peaceable Schools and Communities envisions a global community free from violence, disconnection, and systemic inequity where inclusive, empowered learning that is rooted in the values of affirmation, consensus building, excellence, and equity is a reality for all members. As a result of the Peaceable Schools' efforts, educators, young people, and other community members will have the tools, knowledge and relationships to live out and generate welcoming, dynamic and interconnected communities (Lesley University, "About us")

The central question of my dissertation will be, "How does helping young students become peacemakers affect their academic achievement?" Proceeding from a

constructivist framework and using it to view the data from school climate research, there appears to be promising evidence towards a theory that, “Yes, the same skills that help students to be peaceable and cooperative helps them learn academic subjects better as well.”

My future qualifying papers will delve in more detail into the history, philosophies, methods and definitions of peace education, as well as differentiating between different types of curricula and programs that in my analysis earn that designation. For now, I will note that curricula and programs which satisfy my definitions of “peace education” have been shown in many cases to be capable of bringing about measurable, more pro-peaceful/pro-cooperate attitude change in students (Eckhardt, W., 1984; Jeffries, R. & Harris, I., 1998; Lantieri, L. & Patti, J., 1998; Barnett, R., Adler, A., Easton, J., & Howard, K, 2001; Batiuk, M., Boland, J., & Wilcox, N., 2004 ; Biton, Y., et. al., 2006), and these represent only a fraction of hundreds of such studies in publication. Much of this research has itself been evaluated, with positive results; for example, the Vanderbilt Institute for Public Policy Studies’ Center for Evaluation Research and Methodology closely examined 584 independent studies of such programs and (Derzon, J., Wilson, S., & Cunningham, C., 1999), and focused on 82 to “rate” on a scale of 1-4, concluding in its summary that “school-based programs are effective in preventing and reducing violence and other antisocial behaviors. They accomplish this reduction by successfully reducing the mediating conditions and behaviors they seek to alter” (p. 30).¹¹

¹¹ To be fair, the report did call for a need for more stringent research methods, as the overwhelming majority of the 584 studies they examined did not meet their standards for rigor.

However, I have only found a handful of persuasive studies explicitly linking peace curricula and achievement. I theorize, however, that is because the label of “peace education” has not been applied to the very school climate methods that, in my analysis, *are* peace education. Some even self-identify as such - Teaching Students To Be Peacemakers was created by Johnson & Johnson, the same researchers who pioneered the cooperative learning research and articulation discussed earlier. Laurie Stevahn’s studies about incorporating the Teaching Students to be Peacemakers program into traditional language arts curricula do explicitly make links between conflict resolution skills and academic skills (Stevahn, L., Johnson, D. W., Johnson, R. T., & Real, D., 1996; Stevahn, L., Johnson, D. W., Johnson, R. T., Laginski, A. M., & O’Coin, I, 1996 ; Stevahn, L., Johnson, D. W., Johnson, R. T., Green, K., & Laginski, A. M., 1997. See also Harder, A., 1999). Cohen, et al. (2007) literature review that enough research exists to suggest that:

we now have a research-based school climate-related guidelines that predictably reduce school violence, promote learning and school success in ways that lay the foundation for adults being able to love, work and participate in a democracy. (p 2)

Why is there a need to make an explicit connection, to apply the label of “peace studies?” Our current national and world climate is one that suffers from a pervasive fear of violence, both domestic and foreign based. We are engaged for the first time in sixty years in two simultaneous wars (Iraq and Afghanistan), which themselves are constructed by our political leadership as part of a “global war” with no foreseeable end. Hundreds of billions of dollars have been funneled to this war effort, not to mention towards domestic policing in response to rises in violent crimes at home, all with results that are unclear at best (absent the kind of demand for research-based accountability that, for the

past 20 years, has been levied at public education). Our society will not be able to sustain itself economically or spiritually if we do not actively and consciously seek to develop alternative ways of dealing with conflicts than just through violence. By calling attention to best educational practices that simultaneously build the skills for more cooperative, peaceable relations at home and abroad, we can attempt to equip subsequent generations with the tools to carry out a conscious mission of making our country and world a more peaceful place.

It is undeniable that, beneath its pragmatic mission to prepare students with job skills, the roots of public education lie in utopian visions – even before Mann and Dewey, the early 17th century Czech teacher and philosopher Comenius envisioned education as a means to bring peace in the midst of the wars of the Reformation (Stokes, 2007). It is time to revive Comenius' vision of education as a peacemaking force, for the benefit of our society and our world in the large scale, and in the more immediate scale, our students' improved learning of their academic subjects.

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