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**ADULT LEARNER PARTICIPATION & OUTCOME: A COMPARISON STUDY
BETWEEN THE COMMUNITY ABE/GED PROGRAM AND FAMILY LITERACY
PROGRAM IN TWO COUNTRIES: DO DIFFERENT STRATEGIES YIELD
DIFFERENT RESULTS?**

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ABSTRACT

One of the major criticisms of adult basic education (ABE) programs in the United States is that students from the Even Start family literacy programs as compared to the Community ABE/GED programs are not performing differently (St. Pierre, Ricutti, Tao, Creps, Swartz, Lee, & Parsad, 2003). It was the purpose of this study, therefore, to investigate the relationship between adult learner participation and outcome, and a comparison study of outcomes between Community ABE/GED programs and Even Start family literacy ABE programs in Pennsylvania. This study further compared the results from the Even Start family literacy programs to a similar program (family learning) in Lancashire, UK.

This study analyzed the effects of human capital investment in conjunction with social capital development. This study provided empirical evidence that outcomes from standardized achievement tests (TABE, CASAS, and GED) reflect the impact of social capital acquired through participating in family literacy programs. The sample for this study was taken from the Pennsylvania Bureau of Adult Basic and Literacy Education (ABLE) data set. The sample consisted of 7,397 adult basic education students from both the Community ABE/GED and family literacy programs. More than half of the student population from the sample were female and the ethnic backgrounds of students were majority Caucasian, followed by African Americans, Hispanics, Asians, Native Americans, and Pacific islanders. Overall, students' performance according to this study was within the acceptable norm of the National Reporting System benchmarks.

This study used hierarchical linear modeling (HLM) to investigate how adult basic education program characteristics, such as community and socio-economic factors, influenced the learning outcome of ABE programs and to accurately model student performance within programs. Multilevel analysis indicated that programs are different when the data were analyzed at student-level given reading and mathematics skills scores. In other words, students' achievement test scores are different according to the type of program in which they enrolled (stand-alone Community ABE/GED or Even Start family literacy). The statistical analyses at the student-level indicated that adults who participated in the family literacy program in Pennsylvania for the 2002/2003 PY performed better in both reading and mathematics skills scores than those students enrolled in the Community ABE/GED program for the same period. The results confirmed that adult students who participated in the family literacy programs had higher achievement test scores than those who participated in the stand-alone Community ABE/GED programs. Increased number of hours of participating in the adult basic and literacy programs was not the only factor affecting learning change. Other factors might have included intensity of instruction and instructional setting.

Further hypotheses tested in this study also affirmed the major research questions and the theoretical frame that family literacy programs with high bonding and bridging social capital also have higher learner achievement test scores than stand-alone Community ABE/GED programs. Finally, the study indicated that though differences existed between the U.S. and the UK programs, both programs made similar progress towards social capital acquisition.

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be glory for ever and ever. Amen.*

CHAPTER ONE

INTRODUCTION

Globalization and the Knowledge Society

Globalization and information technologies have rendered many skills obsolete and as a result, workers in today's global economy must acquire new forms of "literacies." Many organizations are finding that their employees lack the basic skills needed to successfully perform their job responsibilities. Lack of cognitive and reading ability levels of these employees can impede performance and learning in the work environment. The job environment can also be threatening to employees who have not received formal or basic education for some length of time. The increased amounts of information generated by the process of globalization in education, politics, and society have produced a greater requirement for the need of knowledge and major emphasis of the development of the individual competencies to meet these needs. It should be asked, what kind of knowledge should be the basis for developing these competencies?

Recently, the Organization for Economic Cooperation and Development (OECD) classified knowledge into four general categories. Knowing what - knowledge of facts; knowing why - knowledge of explanations derived from principles for instance, laws or theories; knowing how - methodological knowledge associated with the competencies and skills for carrying out a task; and knowing who - information method relating to the way knowledge is distributed in its different forms. Despite this worth of "knowing," the OECD (UNESCO, 2003) reported the

following literacy rates pertaining to the developing countries: least developed countries 53.3 percent, Arab States 60.8 percent, East Asia and the Pacific 87.1 percent, Latin America and the Caribbean 89.2 percent, South Asia 56.3, and Sub-Saharan Africa 62.4. These statistics are clear indications that the world still subsists in a “knowledge-divide.”

Education For All (EFA)

The Jomtien (1990) World Conference on Education for All (EFA) and the World Education Forum (2000) in Dakar, addressed concerns about the inadequate provision of basic education, especially in developing countries. The adoption of EFA reaffirmed the concept of education as a fundamental human right and urged the nations of the world to intensify their efforts to meet the basic learning needs of all children, youth, and adults. In the months following Jomtien, a U.S. Coalition for Education for All (USCEFA) was formed in support of the goals of the framework and as a means of bridging domestic and international education agendas. (Fiske, & O’Grady, 2000).

This policy postulates that, "every adult American will be literate and will possess the knowledge and skills necessary to compete in the global economy and exercise the rights and responsibilities of citizenship" (National Education Goals, 1992 p. 3). Notwithstanding this action plan, the National Center for Education Statistics (NCES, 2004) reported that from 1990 through 2001, between 347,000 and 544,000 students in grades 10 through 12 left school without successfully completing a high school program. They also found little change between 1992 and 2003 in adults' ability to read and understand sentences and paragraphs or to understand

documents such as job applications. "One adult unable to read is one too many in America," said U.S. Secretary of Education Margaret Spellings. She indicated that government and policy makers must take a comprehensive and preventive approach, beginning with elementary schools and with special emphasis in high school by focusing resources toward proven, research-based methods to ensure that all adults have the necessary literacy skills to be successful (U.S. Dept of Education, December 15, 2005).

In the United Kingdom, only about 49.2 percent of high school graduates achieved five or more higher grades in GCSE (General Certificate of Secondary Education) in 2000 (DfEE, 2001). The above trend is also true in the case of Ghana, West Africa. The high school completion rate in Ghana, though improved from previous years, still favors limited number of students. There are over five hundred public senior secondary schools in Ghana but only about 90,000 students graduated in 2004 (Bureau of African Affairs, March 2005).

Non-completion of high school often serves as a warning sign of literacy difficulty. Many of those who are not able to complete high school, or those who drop out of the system, later enroll in adult basic education (ABE) program. The reasons why most young people drop out of high school ranges from, repeating a grade, didn't like school in general, had disciplinary problems, had a family to support, or had trouble managing both school and work (Chall & Jacobs, 1983; Walmsley & Allington, 1995). In ABE programs, however, adult learners are voluntary participants (unless mandated by federal or state regulations), and their roles as students are just one of many roles and responsibilities competing for their time and attention. Reasons such as lack of child-care, transportation, and job demands are often cited as the causes of stop out or withdrawal (Quigley, 1995; Beder 1991).

Adult Basic Education Programs

The Division of Adult Education and Literacy (DAEL) advance programs that help illiterate American adults to get the basic skills they need to be productive workers, family members and citizens. These programs (Adult Basic Education, Adult Secondary Education, English as a Second Language (ESL) Acquisition, and Even Start Family Literacy) emphasize basic skills such as reading, writing, math, English language competency and problem solving. Adult education and literacy programs are funded through federal grants to the states. The amount each state receives is based on a formula established by Congress. States, in turn, distribute funds to local eligible entities to provide adult education and literacy services. Individuals and local providers cannot receive grant money directly from the Office of Vocational and Adult Education (OVAE, March 26, 2005) (Available at: <http://www.ed.gov/programs/adultedbasic/funding.html>).

The Division provides assistance to states to improve program quality and capacity. The federal government has provided funding for many years to assist states in establishing and expanding basic education programs for individuals age 16 and over who have not completed high school. The types of services and providers funded under federal legislation, as well as the program's target population, have changed a number of times since it began (Lasater & Elliott, April 2004). Originally established under the Adult Education Act of 1966, the adult education program is currently governed by the Adult Education and Family Literacy Act (AEFLA), which is Title II of the Workforce Investment Act (WIA) of 1998, as amended (P.L. 105-220). WIA makes the adult education program part of a new "one-stop" career center system that includes many federally funded employment and training programs. As indicated in Section 202 of the

AEFLA, the purpose of adult education is to create a partnership among the Federal Government, States, and localities to provide, on a voluntary basis, adult education and literacy services, in order to:

- a) assist adults to become literate and obtain the knowledge and skills necessary for employment and self-sufficiency;
- b) assist adults who are parents to obtain the educational skills necessary to become full partners in the educational development of their children; and
- c) assist adults in the completion of a secondary school education.

Entities funded under the Adult Education and Family Literacy Act (AEFLA) are mandatory partners in this one-stop delivery system. The central focus of AEFLA is on serving those adults who are most in need, including adults with the lowest skill levels, with disabilities, or with other significant barriers to employment and self-sufficiency. In this research study, two models of ABE are considered: "Community stand-alone ESL, ABE, and /or GED" and "Family Literacy" programs.

Community Stand-Alone Model

Though the central focus of the Community stand-alone ESL, ABE, and /or GED program remains to help adults improve their literacy skills, there have been constant changing focuses of the Community stand-alone ABE/GED program to satisfy various needs of the society. One such shift was in the area of welfare reform. Responding to the challenges of the 1996 Personal Responsibility and Work Opportunity Reconciliation Act (PRWORA) and Temporary Assistance for Needy Families (TANF) welfare reform, the federal government and

the adult education and training community explored different delivery strategies. They integrated delivery services to include training, support services, job search, job readiness, coaching, mentoring, job placement, work activities, and post employment services (Knell, 1997). Three types of the delivery systems are: community college; network systems; and the welfare to work program initiative.

The community colleges provide varieties of education and training programs that are integrated to specific job skills as well as to communication, problem solving and team skills. Some community colleges provide day care and counseling services, the types of support services needed by welfare participants. In some states a public school, area vocational system, employment and training center or community-based organization might provide these comprehensive services. In addition, one or more companies might function as the "hub" around which jobs, training, and support are provided to individuals (Knell, 1997).

The network systems are another type of delivery system that can be effective in providing adult education programs to community members. Under this system, a public school, Community Based Organization (CBO), training center, or a college specializes in providing one or several program components but collaborates with other agencies and programs to deliver a number of other services. For example, a public school might provide adult education, job/vocational training and job preparation to adults but might also develop collaborative partnerships with organizations that provide support services such as child care, counseling, health care, housing and job development. Finally, post-employment services might be provided as a joint effort among several of the partners involved in the collaboration (Knell, 1997).

The Welfare-to-Work Program was added to the PRWORA of 1996 as an amendment to the Balanced Budget Act of 1997. It requires each state to amend its TANF plan in order to be

eligible for Welfare-to-Work program funding. The purpose of the Department of Labor State Administered Welfare-to-Work program "is to move and keep individuals in lasting unsubsidized employment . . . and focuses on assistance to hard-to-employ welfare recipients living in high poverty areas" (Federal Register, 1997 volume 62, no. 222). According to the regulations, eligible activities include:

- A. Job readiness activities financed through job vouchers or through contracts with public or private providers.
- B. Employment activities which consist of any of the following:
 - a. Community service programs
 - b. Work experience programs
 - c. Job creation through public or private sector employment wage subsidies
 - d. On-the-job-training.
- C. Job placement services financed through job vouchers or through contracts with public or private providers.
- D. Post-employment services financed through job vouchers or through contracts with public or private providers, which are provided after an individual is placed in one of the employment activities (a-d) or in any subsidized or unsubsidized job.

Post employment activities may include:

- 1. Basic educational skills training
- 2. Occupational skills training
- 3. English as a Second Language (ESL), and
- 4. Mentoring.

Therefore, basic educational skills training, occupational skills training and ESL can be provided to welfare participants as a post-employment activity under the Welfare-to-Work program. Adult education and training may be offered before employment, after employment, or concurrently with other program components, including work. Adult education may be integrated with other activities related to training and work thereby "reinventing" or "retooling" the program design, curriculum and instruction. Education and training activities may be provided at a public school, area vocational center, community college, community location, employment, and training center or at a company site or labor hall (Knell, 1997).

Family Literacy Model

The Even Start family literacy program was originally authorized by the U.S. Congress in 1988 under the Title 1, part B, Subpart 3 of the Elementary and Secondary Education Act of 1965 (ESEA). The family literacy model was designed to help families most in need to break the cycle of poverty and illiteracy; and also to build on existing high quality community resources to provide a unified program of adult education, parenting education, children's education, and interactive parent and child literacy activities. The federally funded Even Start Family Literacy Program began as a small demonstration program in 1989, with \$14.8 million that funded 76 projects nationwide. Number of families served was 2,460 as at 1989/1990-program year; however, 2002/2003-program year saw an estimated increase to about 50,000 families (National Center for Family Literacy [NCFL, 2003]). Even Start intends to address the basic educational needs of low-income parents and their children from birth through age seven. It provides a unified program of interactive literacy activities between parents and their children; training for

parents regarding how to be the primary teacher for their children and full partners in the education of their children; parent literacy training that leads to economic self-sufficiency; and an age-appropriate education to prepare children for success in school and life (St. Pierre, 2003).

The Even Start legislation requires each project to arrange for a local evaluation by an independent evaluator. Given the diversity of program design and service delivery approaches, each project is best suited to assess its progress and effectiveness in relation to its program goals. A synthesis of the methods and findings from more than 100 local evaluation reports was prepared by St. Pierre, Ricciuti & Creps (1999). In 2000-2001, 80 percent or more of all Even Start projects conducted the following kinds of local evaluation activities: interviews or meetings with project staff, project participants, project administrators, and collaborating agencies, tests of adults and children, and observations in early childhood classrooms. Almost all of the projects that used these approaches found them to be useful. Project directors were asked about the kinds of adult assessments that were administered during the year, for diagnostic, placement or evaluation purposes. By far the most popular assessment was the TABE (Tests of Adult Basic Education), which was used by 73 percent of all projects. Although some projects administered the CASAS (Comprehensive Adult Student Assessment System) and others, none of these tests for adults was used by more than one-third of the projects.

Adult education services are provided in a variety of formats by staff who range from volunteers to certified adult education teachers. Local projects provide different types of adult education services, depending on the needs of the parents served. These include adult basic education or instructional support (grades 0 to 4 and 5 to 8), adult secondary education (grades 9 to 12), GED preparation classes, and English as a Second Language classes. Projects that work with parents who have low level basic skills may arrange tutoring through organizations such as

ProLiteracy America or provide one-on-one adult education instruction during center or home visits. Projects must cope not only with the needs of individual parents, but with the complications imposed by welfare reform which exerts an important influence on what is taught in Even Start adult education classes and how long parents can remain in the program. Because of welfare reform, Even Start parents and project leaders may feel an added urgency to focus on job-related skills of parents who lack high-school level academic competencies.

Family and intergenerational literacy programs are intended to improve the literacy of educationally disadvantaged parents and children, based on the assumption that improving the literacy skills of parents may result in better educational experiences for their children. Although theoretical justification for the concept exists, research evidence of its effectiveness is emerging more slowly (Kerka, 1991). Berlin and Sum, (1988) indicated that the level of academic achievement reached by the adult caregiver will have a significant impact on the educational achievement of the child. A parent or other significant adult is a child's first teacher (Anderson, Hiebert, Scott, & Wilkinson, 1985). Family literacy programs provide educational intervention which is greater than the sum of its parts - adult education, parenting education, and child education (Sticht and McDonald, 1989). Recent research, therefore, supports family literacy's effectiveness in addressing the employment goals of adults (NCFL 2000).

The 1992 National Adult Literacy Survey (US Dept. of Education, 1992) reported that most adults who demonstrated low literacy levels were living in poverty, and that children who participate in family literacy programs tend to make gains at least three times greater than would have been expected based on their pre-enrollment rate of development (US Department of Education, 2002). Instruction within a family or workplace literacy program may lead to an increase in achievement than instruction in other settings. (McDonald, 1997; Philliber, Spillman,

& King, 1996). According to Philliber, Spillman, & King (1996), participation in a family literacy program may lead to greater increases in "total reading" than non-family literacy programs.

Statement of the Problem

One of the major criticisms of adult basic education (ABE) programs in the United States is that students from the Even Start family literacy programs as compared to the Community ABE/GED programs are not performing differently (St. Pierre, Ricutti, Tao, Creps, Swartz, Lee, & Parsad, 2003). The third national Even Start evaluation by St. Pierre et al., (2003) reported that given the intuitive appeal of Even Start as an approach for enhancing parent and child literacy, the program wasn't more effective than the mix of services that control group families sought for themselves. These findings raised the concern of ABE programs effectiveness. Are there differences between the stand-alone model and the family literacy model? Which type of program design leads to higher student outcomes? This study investigated the relationship between adult learner participation and outcome, and a comparison study between stand-alone Community ABE/GED programs and Even Start family literacy adult basic education programs.

The definition of literacy has changed over the years to reflect its importance in society. The original definition was the ability to read, write, listen, and speak; however in the early 1900s, basic literacy meant the ability to write one's name. That definition was later expanded to mean the decoding of text, and by the 1930s it had come to include reading and expressing oneself through writing (Bransford et al., 1999). The National Literacy Act of 1991 defined literacy as "an individual's ability to read, write, and speak in English, and compute and solve

problems at levels of proficiency necessary to function on the job and in society to achieve one's goals, and develop one's knowledge and potential" (National Literacy Act of 1991, Sec. 3). Recently, the Educational Testing Service's Center for Global Assessment, defined today's literacy as the ability to use "digital technology, communications tools, and/or networks to access, manage, integrate, evaluate, and create information in order to function in a knowledge society" (International ICT Literacy Panel, 2002, p. 2). In other words, reading, writing, listening, and speaking are important; today's students must be able to acquire multiple "literacies," which include expressing ideas through a range of media.

The National Adult Literacy Survey (NALS, 1992) categorized the U.S. population into five different levels of competencies in relation to a test of reading and math abilities, under three scales: prose, document, and quantitative. These categories (prose, document, and quantitative) comprise the literacy tasks that simulate the types of demands that adults encounter in everyday life. Prose literacy tasks include understanding and using information from texts such as editorials, newspaper articles, poems, and stories. Document literacy tasks include locating and using information found in common artifacts such as job applications, bus schedules, maps, payroll forms, indexes, and tables. Quantitative literacy tasks include performing arithmetic operations required as prose and documents encountered in everyday life (e.g., bank deposit slips, checkbooks, order forms, loan applications) (National Center for Education Statistics, (NCES 2004)).

According to the NCES and the National Assessment of Adult Literacy, released December 15, 2005, approximately 43 percent of adults (93 million people) do not have the literacy skills required to fully reach their potential at home, at work and in the community. Fourteen percent of these individuals, or 30 million American adults, are *Below Basic* skill level

unable to read and understand any written information in English or have great difficult reading. They have few basic skills and are able to do no more than the simplest and most concrete literacy skills such as signing a form or totaling a bank deposit entry. Another 29 percent of the population, or 63 million adults, are at the *Basic* skill level. They can deal only with materials that are simple and clearly laid out.

The National Center for Education Statistics (NCES) noted that in our technological society growing numbers of individuals are expected to be able to attend to multiple features of information in lengthy and sometimes complex displays. To compare and contrast information, to integrate information from various parts of a text or document, to generate ideas and information based on what they read, and to apply arithmetic operations sequentially to solve a problem (NCES 2004). The results of this and other federal surveys, however, indicate that many adults do not demonstrate these levels of proficiency. One of such federal funded research studies focused on adult participation and outcome in adult basic education (ABE) programs. The National Evaluation of Adult Education Programs (NEAEP) conducted in 1991-92 by Development Associates (1993) created profiles of participants in ABE/ESL programs, based on a national sample of new entrants to federally supported ABE and ESL programs over a 12-month period, from April 1991 to April 1992.

Citing from several sources, the authors of these research studies concluded that, adult education and training programs have not been able to greatly increase adults' literacy skills or job opportunities (Datta, 1992; Duffy, 1992; Mikulecky, 1992). Adult basic and secondary education programs have high dropout rates and low levels of intensity, making it difficult to see how they can be expected to lead to positive effects (Moore & Stavrianos, 1994). As a result, there have been the issues of program accountability and learner outcome. Over the past decade,

program accountability has emerged as a critical concern of policy makers, especially those who exercise control over resource allocation (Merrifield, 1998).

Program participation and learner outcomes are critical indicators for program quality. Skills improvement and learning gain have been the goals of adult learners who participate in ABE programs, yet the measurement problems associated with testing learning gains are substantial. The National Evaluation of Adult Education Programs (Development Associates, 1993) reported that ABE programs that tested regularly reported using numerous standardized testing instruments, ranging from the Test of Adult Basic Education (TABE), Slosson Oral Reading Test (SORT), Adult Basic Learning Examination (ABLE), Wide Range Achievement Test (WRAT), Comprehensive Adult Student Assessment System (CASAS), and many locally developed tests.

The literature on outcomes produces mixed results at best; it is a reflection on the very definition of literacy, which varies substantially with context. Therefore, it would be difficult and somehow impossible to assess something so specific (contextualized) with a generalized standardized test approach (Fingeret & Drennon, 1997). However, an appropriate measure of learning gain must reflect what is taught in instruction, which can vary widely among programs and states. An example that highlights the problem is the fact that many states require all ABE programs to pretest and posttest using a standardized test, the TABE being the most commonly used measure. Nevertheless, although the TABE may be an appropriate measure for programs that use a generalized approach, it is not appropriate for those programs that gear towards a contextualized instruction (Beder, 1999). TABE assesses academic skills not functional skills.

Focusing on globalization and lifelong learning goals raises the question of what one can realistically expect adult basic learners to achieve. ABE programs are educational programs and

as such, it is reasonable to expect learners to learn, that is, to acquire knowledge, skills, change, and new meaning (human capital), because of their educational participation. However, human capital investment alone without the associated social networks (social capital) may impede learning and economic success. The core question this study focuses on is: what is the importance of social capital in determining the outcomes of learning?

Theoretical Framework

Building Forms of Capital

This study will explore the nature of capital and various theories of capital so that the conceptual frame of this study (human and social capital) can be properly perceived and located. Capital in its various forms and contexts has emerged as one of the most salient concepts in social sciences including: physical, cultural; human; and social capital.

Physical or economic capital refers to any non-human asset generated by humans and then used in production. Marx (1849) conceptualizes capital as part of the surplus value captured by the capitalists who controls production means, in the circulations of commodities and monies between the production and consumption processes. In these circulations, laborers are paid for their labor with a wage allowing them to purchase such things as food, shelter, and clothing to sustain their lives. They can also invest in other forms of capital (for example, cultural and human).

Bourdieu (1980) defines cultural capital as investments on the part of the dominant class in reproducing a set of symbols and meanings, which are misrecognized and internalized by the

dominated class as their own. The investment, in this theory, is in the pedagogic actions of the reproduction process, such as education, the purpose of which is to indoctrinate the masses to internalize the values of these symbols and meanings. Cultural capital theory also acknowledges that the masses (the dominated class) can invest and acquire these symbols and meanings, even if they misrecognize them as their own. The inference is that while cultural capital is mostly captured by the dominant class through inter-generation transmissions, even the masses (or at least some of them) may generate returns from such investment and acquisition (Lin, 2001).

Human capital theory (Johnson, 1960; Schultz, 1961; Becker, 1993), for example, also conceives capital as investment (e.g., in education) with certain expected returns (earnings). Individual workers invest in technical skills and knowledge so that they can negotiate with those in control of the production process (firms and their agents) for payment of their labor. This payment has value that may be more than what the purchase of subsisting commodities would require and, thus, contain surplus values which in part can be spent for leisure and lifestyle needs and in part turned into capital (Lin, 2001). In his book 'globalization and lifelong education: critical perspectives,' Mulenga (2005) made the assertion that training and other activities are an investment for the individual undertaking them and for society that devotes its scarce resources to them. As an investment, there has to be a return in the future, in the form of income or earnings (rate of return to education (RORE)); which also come in the form of enhanced productive contributions made by those who have received education, training and other activities (Maglen, 1990).

There are four basic assumptions of human capital theory: the first assumption emphasizes that human capital investment increases economic growth; the second assumption is that human beings are economically rational beings who always seek to maximize their

economic utility (utility- maximization behavior of individuals). The third assumption claims that investing in oneself is not different from investing in physical capital; and the fourth assumption is that most differences in individual's earnings are largely a consequence of differences in human capital investment, and that extra-educational obstacles such as race, class, or gender have little or nothing to do with it. In totality, these assumptions conclude that humans are economically rational beings who seek to maximize their economic utility by first maximizing their investment in their education, health, and other areas which improve their production capacity (Schultz, 1989; Becker, 1993; Baptiste, 2001; Mulenga and Shalyefu, 2005).

Social capital, in the other hand, is a concept with a variety of inter-related definitions based on the value of social networks. While various aspects of the concept have been approached by all social science fields, some trace the modern usage of the term to sociologist Jane Jacobs in the 1960s. However, she did not explicitly define a term "social capital" but used it in an article with a reference to the value of networks. The first cohesive exposition of the term was by Pierre Bourdieu in 1972 (though clear formulation in his work can be traced to 1984), and subsequently picked up initially by James Coleman and then others. For a time in the late 1990s, the concept was highly fashionable, with the World Bank devoting a research program to it, and the concept achieving public awareness through Robert Putnam's 2000 book, *Bowling Alone*. Bourdieu (1980) defines social capital as the sum of the potential resources which are linked to possession of a durable network of more or less institutionalized relationships of mutual acquaintance and recognition.

The Theories of Human and Social Capital

This study is based in part upon the theories of "Human Capital Investment" and "Social Capital." Human capital theory predicts that investment in human capital will yield greater economic outputs (Gray & Herr, 1998). As applied to adult basic education programs, this theory predicts that individuals with higher levels of human capital investment earn on average higher salaries and are not likely to depend on society. Developing the human mind and imaginations means that individuals must take the responsibility to improve themselves. In United Kingdom, the Green Paper policy document "The Learning Age" (Department for Education and Employment [DfEE, 1998]) makes clear the role of lifelong learning in relation to the social democratic welfare tradition of the country. It presents lifelong learning as being in everyone's best interests in the light of contemporary worldwide trends. Thus: "for the nation, learning will be the key to a strong economy and an inclusive society. It will offer a way out of dependency and low expectation towards self-reliance and self-confidence... We must bridge the 'learning divide,' which blights so many communities and the widening gap, in terms of employment expectations and income, between those who have benefited from education and training and those who have not," (p. 6)

Writing about human capital theories, Fitzsimons (1997) from the University of Auckland stated that human capital theory stressed the significance of education and training as the key to participation in the new global market economy. These assumptions have been confirmed by Organization for Economic Co-operation and Development (OECD, 1997a p. 7). "The overall economic performance of the OECD countries is increasingly more directly based upon their knowledge stock and their learning capabilities" (Foray & Lundvall, 1996, p. 21).

Clearly, the OECD is attempting to produce a new role for education in terms of the human capital subject required in 'globalized' institutions. Under human capital theory, the basis for nation state structural policy frameworks is to flex labor through regulatory reform in the labor market, as well as raising skill levels by additional investment in education, training and employment schemes, and immigration focused on attracting high-quality human capital (Fitzsimons, 1997)

Human Capital Theory, on the other hand, has been criticized on a number of counts. Quiggin (1999) for example, argued that it is likely that students who are more intellectually able will undertake more education and that these students would have had above-average earnings even in the absence of education. Hence, it is difficult to determine what proportion of the higher incomes of educated people is due to education and what proportion to social networks. In addition, to what extent can adult basic education programs help participants achieve the appropriate and transferable skills to be competitive in the global market place? Since there are multiple variables that can affect whether an adult who participates in ABE will gain favorable learning outcome or employment, and since many have to do with the existing state of the economy and life situation of the individual, can participation in ABE programs (human capital development) alone be held accountable for its graduates' employment statuses? (Beder, 1999).

While the human capital investment theory builds a strong case for continual investment in education and training, this theory alone lacks most of the variables needed to assess adult literacy skills under adult basic education programs. Therefore, this study also takes into account the theory of "social capital." The central idea of social capital, according to Putnam (2000), is that networks and the associated norms of reciprocity have value. The theory of social capital has

come into prominence through the works of Jacobs (1961), Bourdieu (1983), Coleman (1990), and Putnam (2000). Putnam introduces the idea that:

Whereas physical capital refers to physical objects and human capital refers to the properties of individuals, social capital refers to connections among individuals - social networks and norms of reciprocity and trustworthiness that arise from them. In that sense social capital is closely related to what some have called "civic virtue." The difference is that "social capital" calls attention to the fact that civic virtue is most powerful when embedded in a sense network of reciprocal social relations (2000, p. 19).

Thus, interaction enables individuals to build communities, to commit themselves to each other, and to knit the social fabric. A sense of belonging and the concrete experience of social networks can, it is argued, bring great benefits to people (Putnam, 2000). Coleman's (1988) extensive analyses provide a relationship between social capital and education. He defines social capital by its function: "it is not a single entity but a variety of different entities in common: they all consist of some aspect of social structures, and they facilitate certain actions of actors, whether persons or corporate actors, within the structure" (p. 98). The dominant discourse asserts that education is the institutional vehicle for the acquisition of the cultural and human capital necessary for success. This myth postulates that upward mobility is possible through education (adoption of basic literacy and cultural practices). However, just as money without cultural capital is not sufficient for survival, education without the necessary social capital does not warrant success.

Social capital provides a framework for a dynamic study of adult basic education. Fingeret and Drennon (1997) documented that social and personal transformations resulting from participating in adult education are often more evident than better technical literacy skills. They find that the impact of learning is also situational, that is: "when an adult who has not used literacy in a situation does so for the first time, the situation - and the social relationships within

the situation - change" (p. 2). Therefore, social capital goes beyond human capital. The significance of these two theories to adult basic education lie in how well the learning process is designed to incorporate the socio-cultural aspects of adult learners' needs. If ABE participants will achieve a return on investment, then the learning process must be structured in such a way that it meets their human capital and social capital needs.

The decision to participate in adult basic education carries the weight of the person's history, psychology, and current life situation. Learning, therefore, becomes a vehicle for the transformation of these personal processes, especially if the learning environment is conducive to building trust and supportive relationships. These learners identify peer support as an important element to learning because some relationships outside the learning environment become fragile as the learners' change. In addition, the orientation to the ABE program by learners like themselves provides a "zone of proximal development" in which the learners' understanding is enlarged by engagement with others whose abilities are more developed (Fingeret & Drennon, 1997; Vygotsky, 1978; Strawn, 2003). One of the outcomes of literacy development is greater self-confidence in setting goals, solving problems, and engaging literate society. Fingeret and Drennon's study illustrate how learning can be a direct form of social capital and how that learning then builds another iteration of networking, expanding the social capital resources of learners (Strawn, 2003).

Purpose of the Study

The purpose of this study was to investigate the relationship of ABE program participation and learner outcome in a family literacy model and a stand-alone community ABE program. This study addressed questions pertaining to outcomes of adult learners with basic

skills deficiencies. It explored, through literature review, a comparative analysis of adult learner participation and numerous "barriers" that hinder ABE program participation. This study hypothesizes that the family literacy program emphasizes active learning through social interaction, which promotes bonding and bridging social capital; and that participating in family literacy programs enhances learners' achievement test scores.

Significance of the Study

This study is significant for many reasons. For several decades, the federal government has been involved in adult education; however, the nature and extent of federal attention to the needs of adult learners has varied over these periods. From its earliest days, the government provided funds to establish, encourage, and expand programs to assist adults in overcoming educational deficiencies, which would hinder productive and responsible participation in the life and growth of the nation. At the state level, evening schools for adults, part-time education, citizenship and Americanization classes for the foreign-born, and the Chautauqua experience (Case & Case, 1948) were forerunners of the adult education movement. State histories give evidence of organized adult education as early as the 18th century.

However, it was not until the early 1960's, in the Kennedy administration that poverty and adult literacy became a concern. Building on Kennedy's efforts, President Lyndon Johnson and Congress launched a series of programs to end poverty and increase the role of the federal government toward the improvement of education. Since then, there have been continuous programs focused on increasing adult literacy skills through the Adult Education Act. Originally established under the Adult Education Act of 1966, the adult education program is currently

governed by the Adult Education and Family Literacy Act (AEFLA), which is Title II of the Workforce Investment Act (WIA) of 1998 (see appendix B), as amended (P.L. 105-220). WIA makes the adult education program part of a new “one-stop” career center system that includes many federally funded employment and training programs.

Entities funded under the Adult Education and Family Literacy Act (AEFLA) are mandatory partners in this one-stop delivery system. The central focus of AEFLA is on serving those adults who are most in need, including adults with the lowest skill levels, with disabilities, or with other significant barriers to employment and self-sufficiency. Any study that furthers the understanding of the survivability of these literacy program initiatives described above can only serve to better ensure their continuity. In this research study, two models of ABE are considered: "Community stand-alone ESL, ABE, and /or GED" and "Family Literacy" programs.

Research Questions

This study addressed the following questions concerning outcomes of adult learners with basic skill deficiencies who participated in community (stand-alone) adult basic education and Even Start family literacy ABE programs for the program year 2002/2003.

Research Question 1

a) Do Community ABE/GED and Even Start family literacy programs differ given students’ reading scores as measured by TABE, CASAS, and GED?

b) Do Community ABE/GED and Even Start family literacy programs differ given students' mathematics scores as measured by TABE, CASAS, and GED?

Research Question 2

a) If programs are different given reading scores, does type of program explain the difference?

b) If programs are different given mathematics scores, does type of program explain the difference?

Research Question 3

a) Do family literacy adult basic education programs with high bonding and bridging social capital also have higher learner achievement than stand-alone Community ABE/GED programs?

b) Does the length of time participating in the family literacy programs with bridging social capital influence adult literacy skills assessment scores?

Research Question 4

a) For the stand-alone Community ABE/GED programs, do mean instruction hours (MEANINSTRUCTION HOURS) and mean socioeconomic status (MEANSES) predict students' reading and mathematics scores?

b) For the Even Start family Literacy programs, do mean instruction hours (MEANINSTRUCTION HOURS) and mean socioeconomic status (MEANSES) predict students' reading and mathematics scores?

Research Question 5

Do the Pennsylvania ABE programs differ significantly from the national ABE programs?

Research Question 6

Are there similarities between the family literacy programs in Pennsylvania (U.S.) and the family learning programs in Lancashire (UK)?

Study Assumptions

This study assumes that outcomes from standardized achievement tests (like the TABE, CASAS, and the GED) reflect the impact of social capital acquired through participating in family literacy programs. The family literacy program emphasizes active learning (Silberman, 1996) through social interaction, which promotes bonding and bridging social capital; and that participating in family literacy programs enhances learners' achievement scores. Family literacy is designed to help families break the cycle of poverty and illiteracy. To do this, the program

builds on existing high quality community resources to provide a unified program of adult education, parenting education, children's education, and interactive parent and child literacy activities. Adult education in family literacy model emphasizes active learning, peer collaboration, large and small group work, and project-based learning. Lessons focus on the family context and are coordinated with the other three family literacy components, with follow-up application in the home (NCFL, 2003).

Curriculum is functional and integrated; authentic issues (Purcell-Gates, et al., 2000) are used as the basis for literacy learning activities, which themselves feature integration of language arts. Instruction is purposeful; and social interaction is prominent (Padak, 2002). The combination and integration of services described above create a more powerful intervention than stand-alone programs for adults or children. All family literacy program components function as support for each other, creating a system linked in patterns of dependence, independence, and interdependence (NCFL, 2003). To this end, this study theorizes that outcomes from standardized achievement tests (like the TABE, CASAS, and GED) might reflect the impact of social capital acquired through participating in family literacy programs; and that the family literacy model promotes high "bonding" and "bridging" social capital than stand-alone Community ABE/GED program.

This study further assumes that features of an effective family literacy program, therefore, have commonalities with the characteristics of social capital. Social capital in this study refers to the resources of networks, norms or shared values, and trust to which the individual adult learner has access to both as a "private" good or as a community asset. Individuals who draw on these tangible and intangible resources and relationships will have enhanced life opportunities (Balatti & Falk, 2002; Kerka, 2003), and improved test scores.

Two dimensions of social capital development resemble features of family literacy programs. 1) The chronological dimension - is fundamental in the processes that transmit social and cultural norms. The research makes clear how past learning needs to be reconciled with the present; and 2) External dimension - refers to the relationships that people have with the outside world (Balatti & Falk, 2002).

Learning, as a social activity, results from drawing on and building social capital through interactions with others (Schuller et al., 2002). Schuller et al., and Balatti and Falk illustrate how learning creates conditions that help develop the building blocks of social capital. Learning extends, enriches, and reconstructs social networks and builds trust and relationships; it influences the development of shared norms and the values of tolerance, understanding, and respect; and learning affects individual behaviors and attitudes that influence community participation.

Definitions

Adult Basic Education (ABE): denotes those programs, usually funded by state and/or federal sources, that include levels of reading above basic literacy; such programs often add other subject material, ranging from math to science to government (Quigley, 1997).

Authentic or Learner Contextualized: Print materials used in ways that they would be used in the lives of learners outside of their adult education classes (Purcell-Gates, et al., 2000).

Barriers to participation: are conceived to be factors that prevent otherwise motivated adults from participating in adult basic education (Beder, 1991).

Duration of participation: Kassab, Askov, Weirauch, Grinder, & Van Horn, (2004) defined duration in family literacy programs as the "*number of days*" in the program. Kassab et al., suggested that a certain number of adult basic education hours are needed during a program year in order to score at a certain level on posttest. The critical range is between 50 and 99 hours of adult education during a program year.

Persistence in participation: is defined as the "*time in class based on attendance records.*" Adults staying in programs for as long as they can, engaging in self-directed study when they must drop out of their programs, and returning to a program as soon as the demands of their lives allow (Quigley, 1997; Comings et al, 1999).

Social capital: Social capital denotes resources of networks, norms or shared values, and trust to which individuals have access as community members. It is both an individual and a community good (Balatti & Falk, 2002).

Summary

The introduction offered insight into the adult illiteracy phenomena. Introducing the purpose and significance of the study, it provided a conceptual framework for the research, and defined the problem being studied. It brought into view several unanswered questions such as: why should we care about adult skills acquisition at all? Why should adults who lack these skills participate and persist in adult basic education programs to bring their skills up to standard with workforce demands? Finally, is literacy acquisition or higher levels of human capital investment the answer? While the human capital investment theory builds a strong case for continual investment in education and training, this theory lacks most of the variables needed to assess

adult literacy skills under adult basic education programs. Therefore, this study also takes into account the theory of "social capital." The central idea of social capital is that, networks and the associated norms of reciprocity have value. Social capital provides a framework for a dynamic study of adult basic education.

Organization of the Study

Chapter two of this document reviews several bodies of relevant literature pertaining to this research study. As a form of introductory or overview to chapter two, an intellectual review of the role of social capital in collaborative learning is provided as a context for the remainder of the review. The sections of the review are intended to complement the conceptual model outlined earlier in this section (chapter one). It also discusses the strengths in the current literature and application gaps or weaknesses on the role of social capital and adult basic education. This will be followed by a comparative analysis of the literature on adult basic education participation and numerous barriers that hinder adult basic education learners. Chapter three presents the methodology for this study, which will include population and sampling; data collection; and data analysis tool. Chapter four presents the results and the statistical analyses; and chapter five summarizes the entire study, by presenting the discussion and the conclusion (including limitations) of the study.

CHAPTER TWO

REVIEW OF RELEVANT LITERATURE

The comprehensive review of relevant discourses that follow provides the rationale for and the perspective taken in doing a study to compare a community ABE/GED program and family literacy program models. The bulk of the literature review was done using the following resources: a thorough Internet search, a careful search through the Penn State University (University Park) and Cleveland State University (Ohio) libraries resources, including books, magazines, journals, and electronic articles. I used Dissertation Abstract Information Services; personal communications; archival information from National Even Start Family Literacy program; National Center for Family Literacy; National Adult Literacy 1992 Survey; the UK Government's Department for Education and Skills (DfES). I also used information from the United Nations Education Scientific and Cultural Organization (UNESCO); the Organization for Economic Co-operation and Development (OECD); and National Household Education Surveys of the National Center for Education Statistics (NCES).

Social Capital: Patterns of Connectedness

We co-exist at the center of a web whose strands connect us to others. Our world is composed not just of the primary groups (families) within which we find intimacy or the secondary groups (communities) in which we work, study, play, or congregate. It is made up of

the linkages among all of these groups. Our social circles overlap; invisible ties draw us together, creating the world in which we live. When we meet a new person, we often try to find out "Who do you know?" "Where did you grow up?" sometimes we discover that we have a friend, perhaps even a distant relative, in common. If so, we are apt to say, "It's a small world, isn't it?" We refer to these multiple contacts or sets of interdependent relationships as "social networks" (McNall & McNall, 1992). Networks may be created naturally by people who have attended the same schools or joined the same fraternities, clubs, and churches.

The traditional "old boy network" comprises white males from upper-middle and upper classes who use networks to further their own interests and careers. Women and blacks have made special efforts to create their own networks, since they have felt excluded from those of the "old boys" (Kleinman, 1981). Networks are not necessarily composed of people of equal status, nor do people in networks necessarily have the same feelings about one another. Family networks extend beyond immediate family to relatives; however, within the same network, people have different sets of obligations towards one another (McNall & McNall, 1992). There are also weak ties and strong ties in a network. Granovetter (1973) finds that information spreads more widely among people who have weak ties to one another.

In other words, interaction through weak ties enables people to build communities, to commit themselves to each other, and to knit the social fabric. The premise for much of this study is that learning together through collaborative partnerships (as in a family literacy program) is a powerful way to improve oneself, community and environment.

Social Capital in Collaborative Learning

Social capital can be thought of as the framework that supports the process of learning through interaction, and requires the formation of networking paths that are both horizontal (across agencies and sectors) and vertical (agencies to communities to individuals). The quality of the social processes and relationships within which learning interactions take place is especially influential on the quality of the learning outcomes in collaborative approaches. Taken one step further, this suggests that social capital plays an important role in fostering the social networks and information exchange needed to achieve collective action - and sustaining a social and institutional environment that is ready to adapt and change (Allen, Kilvington, & Harmsworth, 2001).

How Collaborative Learning Builds Social Capital

Social capital denotes resources of networks, norms or shared values, and trust to which individuals have access as community members. It is both an individual and a community good (Balatti & Falk, 2002). Collaborative learning programs are usually one of the following types: parents and children learning together, children and youth serving older people, elders serving children and youth, and adults and youth collaborating in service and/or learning (Kaplan, 2001). Successful collaborative learning programs fulfill age-appropriate developmental needs of youth and adults, it is relational and reciprocal, and creates a community in which learning results

through collective engagement in authentic activities (Purcell-Gates, et al., 2000; Kaplan, 2001; Granville, 2001).

Granville (2001) researched the outcomes of a British project that brought together two groups with "negative" social capital who were usually excluded from powerful social networks. This was an instance of youth serving elders; the program provided community service placements for offenders in elder care centers. The project emphasized the shared values of mutual respect, tolerance, and inclusiveness. The youth learned employable skills and value of service, developed self-esteem, and built their stock of social capital while the elders benefited from social and mental stimulation. Hanks and Icenogle (2001) reported on the links between human capital and social capital in the Alabama Intergenerational Network for Service-Learning program, where college students helped adults over 50 in career transition activities. Data from pre/post program surveys showed that trust and communication were built through the shared norms of the workplace, removing misconceptions older and younger workers had about each other.

Literacy is a social practice and its development is intensely social. Examples of adults helping youth are the Foster Grandparent Programs and Retired and Senior Volunteer Programs. The results of these programs indicated that the frequency of tutoring sessions enabled participants to develop trusting relationships. "Something unique stems from the nature of the intergenerational relationship. The dynamic of that relationship (reciprocal and accepting), gives rise to opportunities for learning, growth, and understanding for both participants" (Blake, 2000 p. 1).

Another example of collaborative learning is the Intergenerational School in Cleveland, Ohio (Whitehouse et al., 2002). With its intergenerational and community focus, the school

seeks to not only help prepare its students to be lifelong learners and good community citizens, but also to assess and address the learning interests of the students' adult family members. For example, students share lunch and activities with residents of the nearby Kethley House nursing home. The School has a two-part educational philosophy, as described on its Web site, <http://www.intergenschool.org>. Programs focus on helping students develop into effective and empowered stewards of their communities.

Learning or Training is Associated with Social Capital

Learning, education, or training is associated with greater trust, co-operation, reciprocal engagement and social cohesion. Helliwell and Putnam (1999) and Verba, Schlozman, and Brady (1995) indicated that increased average education levels are associated with increased amounts of trust and did not reduce political participation levels. Schooling positively correlated with reduced alienation and social inequalities, while negatively associated with criminal activities (Wolfe & Haveman, 2000; Comer, 1988). Heyneman (1998) emphasized the potential role of education in contributing to social capital. He stated that education provides knowledge about social contracts among individuals and between individuals and the state. It reinforces behavior expected under social contracts through the socially heterogeneous experiences students have in the schools themselves.

Putnam (2000) noted that 'informal' social capital, social trust and informal connections between people, are stronger predictors of student achievement, and high social capital indicators correlate with low rates of television viewing among children. Bryk, Lee, and Holland (1993) found that Catholic schools in Chicago generally outperformed public schools, which they

attributed to the level of social structures surrounding the Catholic schools. However, there is very little knowledge about the way people's networks (social capital) affect their access to learning. That is, how do our social networks help us create and exchange skills, knowledge and attitudes that in turn will allow us to draw upon other benefits? If we have more social capital (strong and more extensive trust and network ties) then are we more likely to learn new things than people with less social capital? Is our learning affected by the types of network that people have - are networks qualitatively different in nature? (Field, 2005). Finally, are adults who participate in stand-alone Community ABE/GED programs gain less amount of social capital than adults who participate in the family literacy model?

These questions stand at the heart of this research study. Fundamentally, these questions remind us to consider whether some social arrangements are better than others are at promoting or enhancing learning. They also allow us to consider whether some social arrangements promote some types of learning but not others. At most, the strengths of social bonds, trust, and networks may shape general attitudes towards innovation and change, as well as determine the capacity of particular groups to survive external shocks or adapt to sudden changes in the external environment (Field, 2005). Yet, while it is possible that the relationship between social capital and adult basic education is mutually beneficial, it is equally conceivable that the relationship could be negative. Strong community bonds might reinforce norms of low achievement; for instance, an over reliance on informal mechanisms of information exchange may reduce the demand for more formal and systematic forms of training and education (Field & Spence, 2000).

Even so, the literature on schooling and social capital suggests that strong networks and educational achievement are mutually reinforcing (Field, Schuller, & Baron, 2000). Coleman's

(1988) research into schools attainment and social capital concluded that shared norms and stable social networks tend to promote both the cognitive and social development of young people. Logically, then, it might be concluded that the same hold true for adult learners. If so: then the better the stock of social capital in adult basic education classrooms, the greater the capacity for mutual learning and improvements in the quality of learning outcomes.

Literacy Learning and the Social Practice of the Classroom

Classrooms as Institutional Settings

Classrooms, as institutional settings, have a social and cultural history that allows them to have both stable and emergent characteristics (Gutierrez, 1993a, 1993b). Further, classrooms are constitutive of multiple activity systems that interact to promote learning. Learning, however, is not always a benign activity; thus, conflict, tension, and contradiction contribute to the idiosyncratic nature of learning activity (Gutierrez, Rymes, & Larson, 1995). Learning also is not an individual process but rather a 'transactional' (Dewey & Bentley, 1949) process mediated by the use of cultural tools such as writing or spoken language as people participate in routine activities in communities of practice such as ABE classrooms (Gutierrez & Stone, 1997; Lave & Wenger, 1991; Cazden, 1988). Participation in social-interactive processes promotes individual knowledge production and critical empowerment (Freire, 1973).

Central to Freire's approach, literacy is not approached as merely a technical skill to be acquired, but as a necessary foundation for cultural action for freedom, a central aspect of what it means to be a self and socially constituted agent. Most importantly, literacy for Freire is

inherently a political project in which men and women assert their right and responsibility not only to read, understand, and transform their own experiences, but also to reconstitute their relationship with the wider society. In this sense, literacy is fundamental to aggressively constructing one's voice as part of a wider project of possibility and empowerment (Freire & Macedo, 1987).

The potential for multiple spaces exists in the adult basic education classrooms. Gutierrez and Stone (2000) have argued against the seeming "monologism" of learning space in classrooms - that is, the seeming univocal discourse emanating from the teacher as the classroom's official and only script. They argued that classrooms are intrinsically dialogical. From this view, the social spaces of the classroom are constitutive of the history of the social practices of schools, the particular habitus of the teacher, and individual responses to the normative practices. Through this analytic lens, the conflicts, tensions, and contradictions that emerge within and across the various social spaces are made visible. There is, therefore, the need of a theoretical category of a "third space" to identify and describe the competing discourses and epistemologies of the different social actors in the social practice of literacy learning (Gutierrez, Baquedano-Lopez, & Turner, 1997).

The third space is a discursive space in which alternative and competing discourses and "positionings" transform conflict and difference into rich zones of collaboration and learning. In this way, the third space provides the "mediational" context and tools necessary for future development. Thus, the third space differs from the other spaces in that the dialogue among participants occurs as nonrandom associations between their scripts and is a genuine exchange of perspectives and worldviews. Accordingly, in this context, one can observe and document the collective negotiation of meaning (Gutierrez & Stone, 2000). The significance here is that, this

study challenges the limitations of the exclusive use of more traditional measures of learning and proposes a more expanded understanding of measures of learning and achievement, especially when applied in the context of adult learners.

Adult Learners and the Learning Process

Our thinking about adult learners and the learning process are shaped by the knowledge of how adults change and develop across the lifespan (Clark & Caffarella, 1999a), and the environment in which learning occurs plays an important role in successful learning (Merriam & Brocket, 1995). The literature on adult learning and development has expanded during the past decade. However, most of the empirical work in adult education has been based on learning theories developed by educational psychologists. For example, Smith's (1982) learning how to learn model; Knowles' (1980) experience-based learning approaches, and Tough's (1979) learning projects model: all may be traced to psychologically based learning theories (Smith & Pourchot, 1998).

Claims about learning and development are defined by the theories underlying the claims (Strauss, 1993b). For example, the radical nativists contend that mental states are determined by genetic make up or are built into the mind/brain. Within such framework there cannot be any development, because the mental structures exist when the infant is born (Kaye, 1993) and that the change that occurs throughout life must be defined as "learning." However, the radical behaviorist observes behavior and seeks to determine the conditions that affect a given behavior (Skinner, 1938). To the radical behaviorist, infants are born without knowledge and the environment controls the process of adaptation through the role it plays in establishing and

modifying contingencies. Development, then, is only a process of learning (Granott, 1998). On the other hand, the structuralists view development as a process of creating powerful structures out of weaker structures.

Piaget's (1977, 1985) theory suggests that cognition has its base in the biological capacities of human infants, and that knowledge is derived from action. He theorized that discrepancies between existing schemes or concepts and contemporary experiences promoted cognitive development. Piaget's cognitive development emphasized a process in which individuals investigate, explore, discover, and rediscover meaning in their world. Learning in this view was simply the application of existing mental structures to new contexts (Granott, 1998). Vygotsky's (1978) sociocultural approach claimed that what is learned on the 'interpersonal' plane is then internalized on the 'intrapersonal' plane and becomes development. In analyzing Vygotsky's work, Davydov (1995) inferred that the mental structures and functioning of people raised in a specific culture would be different from those raised in other cultures. He further argued that, individuals could promote their own cognitive development by seeking interactions with others who can help draw them to higher levels of functioning within their "zone of proximal development."

The Constructivist View of Learning

Bransford, Brown, and Cocking (2000) argued that adults construct new knowledge based upon their current knowledge, and such knowledge can be facilitative or faulty. Students must be able to gain a deep understanding of this factual knowledge within a particular contextual framework and be able to apply that knowledge in new situations. In addition, instruction should be facilitated in such a manner that allows for the development of

metacognitive tools so students can assess their own learning (or become self-regulated).

Martinez, (1999) however, describes how an individual approaches, chooses, and sets goals in his/her learning process. Martinez described four kinds of adult learners: an intentional learner - highly motivated, able to set goals, uses achievement-related strategies and mental process to ensure learning. A performing learner - a skilled learner who uses cognitive processes (memorization, mnemonics, and problem solving) to learn; they are task-oriented and take fewer risks with challenging goals. Conforming learners, however, do not have the initiative to give knowledge new meaning, while the resistant learner, in essence, avoids learning and does not see the power of learning. Most adult basic education learners belong to the last two groups (Beder, 1991).

The constructivist discourse began to take shape in the 1980s. This discourse reflected the framework of andragogy (Knowles, 1980); thus, "learners' experience was the avenue through which teaching gained entry" (Pratt & Nesbit, 2000). Experience is therefore, constructed and interpreted by the learner and then stored as "cognitive maps" or "schemata." Teaching then was about helping adults to construct a better, or more complex, differentiated, and integrated cognitive structures (Pratt & Nesbit, 2000). Askov (2000) posited that constructivist mode of learning has great relevance to adult education, especially, adult literacy programs. Teachers and learners design instruction to meet the learners' needs and skill levels; and the curriculum is based on "common knowledge" and the prior experiences of the participants.

In a family literacy program, the common curriculum content could be built around the concerns of the family, relating to parenting decisions. In a workplace learning setting, however, the content could be around the applicable issues in the workplace or tasks (or skills) needed to perform a particular job (Askov, 2000). Accepting the assumptions of "constructivism" is one

thing; however, translating these assumptions into adult basic education theory and practice is quite a different position. For example, recent work that supports constructivist perspectives has brought into focus the former assumptions about the relationship of "context" and "learner" as well as between "learner" and "knowledge" and "knowledge" and "context" (Wilson & Hayes, 2000, p. 671). Another difficulty identified by Askov (2000) is in the area of assessment: for example, in adult basic education program. "On the other hand, qualitative measures, such as student portfolios, interviews, and observations, are appropriate for assessment and program evaluation in this learning environment" (p. 256). Though these qualitative measures are valuable for student and teacher feedback, they are not usually used for program accountability.

The Sociocultural View of Learning

Sociocultural theory, however, views learning as integration into a community of practice in which social actions are identified and classroom activities designed (Lave & Wenger, 1991). With the introduction of the "sociocultural" discourse, learning was no more constituted in predominantly psychological terms; neither "was the primary learning task one of trying to accommodate new experience within existing cognitive structures. Learning was assumed to start at an unconscious level: as people interact socially, within a community of practice, or social network of relations" (p. 121).

Social learning concepts evolved from awareness that much learning takes place as a result of observing and imitating other people's behavior (Bandura & Walters, 1963). Changes in behavior can occur without linking it to a specific pattern of reinforcement. They can also occur with less trial-and-error practice; thus a person can imitate someone performing a task or saying a new expression on the first try. The principles of social learning are assumed to operate in the

same way throughout life; and the concept highlights the relevance of models' behavior in guiding the behavior of others. Therefore, the similarity in behavior among people of the same ages reflects their exposure to common history of models, rewards, and punishments (Newman & Newman, 1999). Culture, therefore, "is meant to refer to the learned systems of meanings and patterns of behaviors that are shared by a group of people and transmitted from one generation to the next" (Newman & Newman, 1999, p. 79). "Physical culture" relates to objects, technologies, structures, tools, and other artifacts of a culture, while "social culture" denotes the norms, roles, beliefs, values, rites, and customs (Herkovits, 1948; Betancourt & Lopez, 1993).

Sociocultural view of learning brings renewed interest to areas such as learning in the workplace and non-formal education settings, i.e. adult literacy. This discourse posits that learning is based on contextualized social relations, power, and particularities of circumstances and settings. With recent publication of English version of Vygotsky (1978) came an overwhelming number of writings that acknowledged the role of social context and language in learning. Neo-Vygotskian notions of socioculturally based intelligence have embraced research on activity settings, while advancing the recent shift in education from both mechanistic and pure discovery models of instruction to guided learning and cognitive apprenticeships (Brown, Ash, Rutherford, Nakagawa, Gordon, & Campione, 1993; Wells & Chang-Wells, 1992; Bonk, Kim, & Zeng, 2006). "The basic tenet of the sociocultural approach to mind is that human mental functioning is inherently situated in social interactional, cultural, institutional, and historical contexts" (Wertsch, 1991).

"Constructivism" and "sociocultural" theories both have their strengths and weaknesses. Critics point out that "sociocultural" theory emphasizes too much on social interaction instead of social action. For example: Fox (2001) criticized the concept of "shared-learning," embedded in

sociocultural theory. He stated that focusing much attention on teaching as a joint construction of knowledge “risks ignoring the extent to which learning depends on independent practice and problem-solving; it tends to highlight learning as conceptualization and to ignore learning as the formation or revision of skills” (p. 30). Sociocultural theory has also been criticized for its weakness in identifying learner motivation and its de-emphasis on practice and experiential learning. On the other hand, critics have accused the constructivists as counting anything and everything equally as knowledge. Von-Glasersfeld (1998) effectively pointed out the weakness of this perspective, stating that, “truth in constructivism is replaced by viability” (p. 25). In other words, “viability is relative to a context of goals and purposes. But these goals and purposes are not limited to the concrete or material” (p. 7).

The Social Constructivist Approach to Learning

Social constructivists, therefore, expand the concept of “viability” by defining it as that which fits not only the individual’s scheme of the world, but also fits within the larger social context. It is through checking out our understandings and perspectives with others that we develop a sense of the viability of ideas (Jones, 2002). This process of idea testing can be seen in the classrooms of teachers who value students’ ideas and promote the process of critical thinking. Jarvis (1998) describes ‘social constructivism’ as knowledge created between 'knowers' and hence subscribes to a notion of the potential for mutual, shared understanding. While this may present a lack of congruence with the radical constructivist suggestion of uniqueness of constructs, it is the premise on which much of pedagogical emphasis is placed. The radical constructivist stance offers a metaphor of an evolving, adapting, isolated individual with his/her

own private domain of experience. Social constructivism, in contrast offers a metaphor of people in conversation, socially constructing and sharing versions of the world (Jones, 2002).

Family Literacy as a Structure of Social Capital

Family literacy supports the ability of intergenerational activity to develop community capacity and build social capital through creation of new community networks and family support systems. Family literacy programs affect the role and effectiveness of parents in helping their children learn. If parents understand the language and literacy lessons their children learn in school, they can more easily provide the experiences necessary for their children to succeed (NCFL, 2003). Bringing parents and children together to learn in an educational setting is the core of family literacy and the way to provide parents with firsthand experiences about what their children learn and how they are taught. Family literacy is a unique approach to education that works by bringing together parents and children to learn and receive their education. Parents improve their basic skills in the adult education classroom, have a time to come together to talk about their own educational needs as well as the needs of their children, and work with their children during Interactive Literacy/Parent and Child Together (PACT) Time, creating a very holistic approach to serving the educational needs of the family (NCFL, 2003).

The vital ingredients that define an effective comprehensive family literacy program are integrated family-focused services for both generations with sufficient intensity and duration of instruction to effect significant changes. Programs target parents and children most in need of improving their literacy skills, which often means families living at the lowest economic levels. These families may live in urban or rural communities; they often represent a variety of cultures;

many receive public aid or have done so in the recent past. All have significant educational and non-educational barriers that stand in the way of obtaining meaningful employment, academic success, and economic stability. A key element in family literacy is that it brings together parents and their children in an educational environment to facilitate and nurture the learning relationship between them (NCFL, 2003).

Family literacy works to improve the educational performance of adults and children by fostering a learning partnership between schools, teachers, and parents. As parents increase their academic skills, they are better able to support their children's education while also increasing their likelihood of gainful employment (Benjamin, 1993; Henderson & Berla, 1994; Benseman, 1989). As the parent's level of comfort with the school increases, the parent becomes a stronger advocate for the school within the community. Family literacy offers a flexible and comprehensive educational approach, making it an ideal umbrella for collaboration among agencies at the state and local levels to draw on the experience of individuals in child and adult education, health, and labor. The strengths-based approach of family literacy encourages programs to adapt to meet the immediate and long-term needs of the families served, encompassing preschool and elementary school children, teen parents, low-literacy parents, low-wage working parents, English language learners, and extended family, in both rural and urban settings.

Another reason for family literacy's appeal is its comprehensiveness. By educating two generations at once, communities can accomplish change in their educational and economic futures. Perhaps most significant, by influencing today's teen-parents and children, family literacy helps tomorrow's parents break the cycle of low literacy and poverty for generations to come (Sticht & McDonald, 1990; Logan et al., 2002; St. Pierre et al., 2003; NCFL, 2000). The

more compelling rationale is the learning inherent in effective intergenerational activities. Learning as a social activity results from drawing on and building social capital through interactions with others (Schuller et al., 2002) as demonstrated in family literacy programs.

Social Interaction and Basic Skills Achievement

Literacy is a fundamentally important resource in all kinds of social interaction. Networks only happen through interaction - talking, listening, nonverbal communication, reading, and writing. Literacies of interaction occur in all facets of our lives, including home, public forums, schools, community centers, clubs, and associations (Mathew, 1999). Wilkinson (1991) defined community as interaction, and stated that interaction is literacy in various forms:

Sociological definitions emphasize interpersonal bonds such as shared territory, a common life, collective actions, and mutual identity. The essential ingredient is social interaction. Social interaction delineates a territory as the community locale; it provides the associations that comprise the local society; it gives structure and direction to processes of collective action; and it is the source of community identity. ... The substance of community is social interaction (p. 13)

Bourdieu (1983) introduced the term 'social capital' to the sociological world in his paper called 'Economic Capital, Cultural Capital, Social Capital' and it is now located in every major discipline that relates to social science, economics, education and sociology. Portes (1998) observes that, whereas "economic capital is in people's bank accounts and human capital is inside their heads, social capital inheres in the structure of their relationships" (p. 7). Several studies have explored the relationship between social capital and educational achievement.

Educational Achievement and Social Capital

Dika and Singh (2002), from their empirical study "Application of Social Capital in Educational Literature: A Critical Synthesis," reported that social capital indicators and

indicators of educational attainment are positively linked, but theoretical and empirical support could be stronger. According to their synthesis, all nine studies they studied that specifically linked achievement test scores with social capital used the National Longitudinal Study of 1988 (NELS) database. Four achievement tests were completed by NELS respondents: math, sciences, reading, and history. Educational attainment and grades were positively associated with strong help networks of parents, number of friends known by parents and parents involvement in school. The influence of interactions with others outside the family is also significant, including discussions about jobs and education with other adults, and teacher's expectations and influence (Dika & Singh, 2002).

In another research with Mexican-origin youth, Stanton-Salazar and Dornbusch (1995) studied institutional-based social capital as an outcome of grades. Grades were positively related to three different informational network variables: number of school-based weak ties, number of non-kin weak ties, and proportion of non-Mexican origin members. Granovetter (1973) hypothesized that weak ties to other social circles provide access to social capital for instrumental action, whereas social capital within one's own circle is homophilous (i.e., involving people who tend to be alike).

Balatti and Falk (2002) research on "Socioeconomic Contributions of Adult Learning to Community: A Social Capital Perspective," found that there are wider benefits of learning in adult and community education, including: experiencing a sense of trust and identification with community and society; interacting more effectively with family members, coworkers, and other community members; and reuniting with family. They indicated that the benefits go well beyond cost savings from reduced demand on health services, law enforcement, and social welfare services. Benefits also include economic and social contributions made by more learned citizens

when engaging in family and social life, in paid labor, in volunteer work, and through civic participation more generally.

Outcomes of Participation in ABE

Outcomes are changes that occur following adult learners participation in ABE. These changes imply cause and effect - that is, participation is the cause and the measurable changes in knowledge, skills, attitudes, and behavior are the effects (Beder, 1999). However, federal and state evaluations of ABE have contradicting findings: most outcome assessment studies show some form of learning gains, others do not. The following are analyses of the 1990-1994 National Evaluation of Adult Education Program (NEAEP) and the 1997-1998 through 2000-2001 Third National Even Start Evaluation: Program Impacts and Implications for Improvement. These national evaluations of adult basic education programs were chosen because of the comprehensive nature of the studies.

The National Evaluation of Adult Education Program (NEAEP) 1990-1994

The NEAEP was a four-year study (from 1990-1994). It was one of the most comprehensive adult education evaluation program financed by the Department of Education. The NEAEP utilized several procedures to collect data including: the Universe Survey; Comprehensive Program Profiles; Client Intake Record A and B; Client Update Record; Client Test Record; and Telephone Follow-up Survey. The Universe Survey originally collected data from about 2,600 programs and a later telephone follow-up survey from 5,400 clients in 109 programs. Cohen, Garet, and Condelli (1996) commented on the telephone survey that “our

review of the telephone survey found that the survey respondents differed from non-respondents in many ways, suggesting that estimates from this data ought not to be generalized to the population of clients” (p. xi). Although the NEAEP provided a detailed and comprehensive description of program characteristics, staff characteristics, instructional practices, and learner attendance patterns, the most concern was the outcome data. Most outcome data were collected from the Client Record Forms, the Client Test Records, and the Telephone Follow-up Survey and can be found in the Fourth Report (Young et al., 1994a). Because of the large-scale nature of the evaluation, the NEAEP study encountered many problems.

Data collection problems experienced by the NEAEP study put their findings into disrepute. The U.S. Department of Education awarded a second contract to the Pelavin Research Institute to “conduct a comprehensive review of the study methodology, quality of data, and statistical methods used in prior analysis; and to validate reported findings, make needed corrections and conduct new analyses” (Cohen, Garet, & Condelli, 1996, p. vi). At the heart of the NEAEP was to be a set of approximately 150 local programs that were to provide detailed program information and longitudinal (18-month) information on learners, including pre and posttests. To enable generalization from programs and their clients to the entire federal adult literacy education program, participating programs were to be selected using a probability of selection proportionate to size methodology (Development Associates, 1992). In accord with this methodology, 18 programs with 20,000 or more participants were so large that they were automatically selected for the study (i.e., they had a probability of selection equal to 1). There were other issues like "operational definitions:" for instance; the NEAEP defined a program as the administrative unit that served as sub-grantee for federal funds. As such, the City of New

York and the Los Angeles Unified School District were defined as programs. As the NEAEP explained:

Sometimes a basic grant is awarded to a regional administrative service agency that has several sub-grantees, some of which may be local school districts and other community based organizations; and grantees exercise varying degree of administrative control over the service delivery agencies. (Young et al., 1994a, p. 4)

Other problems included the definition of "client," program, subject, and site attrition.

Although the NEAEP provided economic and other incentives for programs to cooperate in data collection, it had no direct authority over the participating programs. As a result:

Our goal was to enlist participation of 150 local programs. When data collection began, 141 programs had agreed to participate, 114 from the initially selected set of 150, 25 first order replacements, and two replacements of replacements. After 10 months of data collection, 2 of the originally selected 150 had terminated operations, 3 had formally withdrawn from the evaluation, and another 5 had failed to submit data. Within the first six months, 16 percent of program directors trained in the requirements of the study had departed, sometimes because their positions had been abolished (Young et al., 1994a, p. 5).

Notwithstanding the above problems encountered by the NEAEP study, they produced the following outcome: tested learning gain, clients' assessment of personal goal attainment, and how often clients read to their children (Beder, 1999).

Tested learning gain

The NEAEP used the Comprehensive Adult Student Assessment System (CASAS), which was used to measure learning gain for ESL, and the Test of Adult Basic Education (TABE), which was used for adult basic education (ABE) and adult secondary education (ASE). The NEAEP was able to obtain only 614 valid cases from an intended 19,796 potentially available cases. Because intervals between pre- and posttests varied, the mean hours of

instruction between pre- and posttests was reported. For ESL students, who on average received 120 hours and 14 weeks of instruction between the pre- and posttests, the learning gain on the CASAS was five scale points. ABE students received a mean of 84 hours of instruction between pre- and posttests and attended for an average of 15 weeks. On average their gain was 15 points on the TABE. Adult secondary students received a mean of 63 hours of instruction and gained 7 points on the TABE. All gains were statistically significant (one sample *t*-tests) at the .001 level (Young et al., 1994a).

Employment and Further Education

Sixty-three percent of the learners reported that they were unemployed when they entered the program and 69 percent were employed at the time of follow-up. However, without a control group it is impossible to determine whether these statistically significant, but modest, gains were due to instruction or to other unknown reasons. In fact, when NEAEP asked those who became employed between enrollment and follow-up if what they learned in the program helped them get a job, a majority (57 percent) said no, suggesting that learners perceived that factors other than adult literacy education were critical for job acquisition. With respect to further education, of those learners who did not possess a high school diploma at intake, at follow-up 18 percent were enrolled in further education (11 percent postsecondary, 6 percent GED, 1 percent other), 44 percent had no plans to enroll, and 38 percent expected to enroll within a year (Beder, 1999).

Self-image and learner satisfaction

The NEAEP found that 65 percent of the learners reported that they felt better about themselves at follow-up. These data are mitigated by the fact that the follow-up sample included both respondents who had terminated because they attained their goals and respondents who had dropped out for other reasons. When respondents were asked at follow-up why they left the program, 41 percent were designated by NEAEP as having “left satisfied,” 45 percent were designated as having left for the sake of outside events beyond their control, and 7 percent left for instructional factors. On the average, satisfied respondents had substantially more hours of instruction than respondents who had left for other reasons (Beder, 1999).

When the limitations of the NEAEP are considered with respect to outcome findings, it must be concluded that at best the findings are suspect and at worst they are unusable. Perhaps because the NEAEP cost almost \$3 million and took four years to complete, the evaluation was subject to a considerably higher level of scrutiny than the national evaluations that preceded it. Because the data collection methods of the earlier evaluations are in many ways similar to the NEAEP, the suspicion lingers that the earlier national evaluations, too, were flawed in ways similar to the NEAEP and that these flaws either went unnoticed or were not reported (Beder, 1999).

Third National Even Start Evaluation: Program Impacts and Implications for Improvement. The 1997-1998 through 2000-2001 Study

The Third National Even Start evaluation conducted by St. Pierre et al. (2003) continued the U.S. Department of Education's decade-long series of studies of the Even Start program. Two complementary sets of information were collected in the third national Even Start evaluation through (1) the Even Start Performance Information Reporting System (ESPIRS) and (2) the Experimental Design Study (EDS). These two sets of data were designed to assess the outcomes and effects of Even Start, as well as to augment the descriptive information about Even Start programs and families that contained in various national evaluation reports prepared during the past ten years.

The ESPIRS was used to collect annual data from 1997-1998 through 2000-2001 on the universe of Even Start projects, the types of projects funded, the nature and amount of services they provided, the collaborative efforts they undertook, and the obstacles that existed to implementation. The ESPIRS also was used to collect data on Even Start children, parents, and families, including demographic information, education and income data, the amount of service they received, and the progress they made on indicators of parent, child, and family well-being, such as economic self-sufficiency, literacy skills, and parent-child relationships.

Project directors were asked about the extent to which they provide various services to help prepare parents for employment. In 2000-2001, almost 90 percent of Even Start projects prepared parents for employment by using adult education class time to discuss vocational topics and job retention and to show adults how to access community services and vocational information. Similarly, about 80 percent of Even Start projects used time in parenting classes to

administer career interest/exploration surveys and to practice job skills. In 2000-2001, Even Start projects offered parents an average of 473 hours of adult basic education for grades 0 to 4, 476 hours of adult basic education for grades 5 to 8, 504 hours of adult secondary education, 487 hours of GED preparation, 684 hours of high school services, and 381 hours of ESL services. This is equivalent to about 30 to 40 hours a month, or three three-hour morning or evening sessions per week, assuming a year-round program.

Intensity of services

Intensity of services was measured in relationship to all Even Start projects. A single definition of high-, moderate-, and low-intensity projects was used across different types of adult education. That is, regardless of whether we are talking about GED, ESL, ASE, or beginning or intermediate ABE programs, a high-intensity project is defined as one that offers 60 or more hours of instruction each month, and a low-intensity project is defined as one that offers eight or fewer hours a month. Most Even Start projects offered several types of adult education services: 90 percent offered GED preparation, 66 percent offered ESL services, 65 percent offered adult secondary education, and a little more than 50 percent offered beginning adult basic education and intermediate adult basic education.

Two sets of data were used to assess Even Start's effectiveness. Primary data came from the Experimental Design Study (EDS) where 18 projects voluntarily agreed to randomly assign incoming families to be in Even Start or a control group, providing an experimental assessment of Even Start's impacts. Supporting data came from the Even Start Performance Information Reporting System (ESPIRS).

EDS sample and evaluation design

The EDS called for pretest, posttest, and follow-up data to be collected from families in 18 projects (one home-based project and 17 center-based or home/center-based projects). Projects were recruited from urban and rural areas, as well as projects that served varying proportions of ESL participants. Over the two recruitment years, 115 out of a universe of about 750 programs met the selection criteria, and 18 of these projects (about 15 percent of the eligible projects) were willing to participate in the study. The background characteristics of families in the two cohorts of projects were similar, so data were combined across all 18 projects for analytic purposes. Each of the 18 EDS projects was asked to recruit families as they normally do and to provide listings of eligible families to Abt Associates staff who randomly assigned families either to participate in Even Start (two-thirds of the families) or to be in a control group (one-third of the families). Assignment to the control group meant that the family could not participate in Even Start for one year. A total of 463 families were randomly assigned in the EDS - 309 to Even Start and 154 to the control group, maintaining the planned 2:1 ratio. This is an average of about 26 families per project.

Comparability of Even Start and control groups

Even Start and control families were statistically equivalent at the time of randomization and at the pretest. Group equivalence at the time of randomization was guaranteed, within known statistical bounds, by proper implementation of random assignment and a sufficiently large sample size. However, 10 percent of the families were lost between the time of randomization

and time of pretest. This attrition occurred equally in the Even Start and control groups. An analysis of pretest data showed that Even Start and control groups did not differ significantly on the percent of families where Spanish was spoken at home, families where English was spoken at home, Hispanic families, parents with a high school diploma or a GED, single parent households, employed parents, and households with annual income less than \$9,000.

Data collection

EDS data were collected at three time points. For the first group of 11 projects, pretest data were collected in fall 1999, posttest data in spring 2000, and follow-up data in spring 2001. For the second group of seven projects, data were collected a year later (pretest in fall 2000, posttest in spring 2001, follow-up in spring 2002). In many projects, families entered Even Start on a rolling basis, so the pretest data collection was spread across several months (October through January) as new families entered the program. There was an average of 8.8 months between pretest and posttest, with a minimum of 5 months and maximum of 12 months. Due to the high percentage of ESL families, measures were available in both English and Spanish.

Generalizability of EDS findings

The EDS used a random assignment design, the strongest approach for estimating the impacts of a program. However, projects volunteered for this study instead of being randomly selected, so the results of this study cannot be generalized to the Even Start population on a strict statistical basis. The plan was to select EDS projects to include urban and rural projects, projects

that offer varying amounts of instruction, and projects that serve high and low percentages of ESL families. Due to the voluntary nature of the study, this plan could not be implemented perfectly, and while the EDS projects represented major kinds of projects funded in Even Start, the EDS families were more likely than the population of Even Start families to be Hispanic (75 percent vs. 46 percent). Further, 83 percent of EDS projects were in urban areas compared with 55 percent of all Even Start projects. These data suggested that findings from the EDS were most relevant to urban projects that serve large numbers of Hispanic/ESL families.

A substantial amount of change occurred between pretest and posttest for families that were new to Even Start. The total number of hours that a family participated in Even Start had a positive relationship to pre-post gains on 13 of 14 parent-reported outcomes. The length of time that a family participated in Even Start had a positive relationship to pre-post gains on 11 of 14 parent-reported outcomes. Child age and years of parent education also had a positive relationship to pre-post gains on several parent-reported outcomes. Parents in center-based projects reported greater gains on three outcomes - child knowledge of print concepts; extent to which parent reads at home; parent participation in school. Parents in projects that used the same instructor for multiple instructional services reported greater gains on three outcomes - extent to which parent reads at home; extent to which parent writes at home; parent participation in school. In addition, parents in projects that offered a wider variety of parenting education topics reported greater gains on three outcomes - non-print resources at home; extent of parent reading at home; extent of parent writing at home.

Parents from families that participated more intensively in Even Start (both in terms of total hours of participation and months of participation) reported that their children do better on literacy-related tasks (e.g., knowledge of the alphabet, numbers and colors). They also reported

that they read a greater variety of materials to their children more frequently; that they have more books and other print resources at home; and that they themselves read and write more than parents from families that participated less intensively. Parents in projects that were center-based, that use the same staff for multiple instructional services, and that offer a wider variety of parenting education topics reported that they were more likely to read and write at home and to participate in school activities.

As was the case with relational analyses based on data from the EDS, the relationships between parent-reported outcomes and family/project characteristics might be due to factors such as differences in the motivation of families or in their opportunity to participate in Even Start. Still, the findings do offer useful insights into how the extent of participation in Even Start relates to the way in which parents perceive changes in literacy-related activities for themselves and their children. Because the amount of participation is a function of family characteristics, as well as program characteristics, these relationships may also be explained by factors such as differences in the motivation of families or in their opportunity to participate in Even Start (St. Pierre, et al., 2003)

Counter to the Third National Even Start Evaluation: Program Impacts and Implications for Improvement (St. Pierre et al., 2003), Weirauch, (2005) questioned the validity and reliability of the Third National Even Start Evaluation report. According to her report, "Even Start Revisited: A Counter to the Third National Even Start Evaluation Program Impacts and Implications for Improvement (2003)," more than one participant regarded the ESPIRS data as "flawed." In Pennsylvania, for example, programs did not consistently complete the ESPIRS forms; thus, many were missing information and had to be discarded. During the time of the study, the method of entering ESPIRS data was changed and programs had difficulty with the

new technology. Programs received late feedback and did not see the value of providing accurate and complete data. Programs were not required to report outcome data for parents and children. Because programs did not receive feedback for over a year, if at all, it could not be linked to program improvement. The accuracy of the ESPIRS data used for the national evaluation was, therefore, not reliable and findings based on those data are questionable. Of 115 eligible projects, only 18 volunteered to participate as the sample. The Follow-Up Findings from the Experimental Design Study voiced concern that 97 eligible projects refused to participate which put into question the generalizability of the findings.

The National Center for Family Literacy Study

The purpose of this study was to determine the long-term effects for a group of Even Start programs that met the National Center for Family Literacy's quality standards. The rationale for the study was that because programs evaluated in the National Even Start Evaluation did not necessarily meet the high quality standards established by the National Center for Family Literacy, the effect of high quality standards was "obscured." Program sites were selected through nomination by "leaders in the Even Start community" and by external evaluators familiar with Even Start programs (Hayes, 1997).

Data were collected from 15 programs that served a total of 507 children and 508 adults. Data were supplemented by the evaluation reports of several other family literacy programs. Data were collected in January and February 1997, one to six years after families had terminated the program, by local site coordinators who used forms and procedures developed by the National Center for Family Literacy. Most of the study focused on effects on children; only the impacts of adult literacy education are reported here (Hayes, 1997).

Sixty-two percent of those for whom attainment of high school certification was an appropriate goal attained high school certification. Fifty percent either obtained a job or obtained a better job. Forty percent enrolled in higher education. Forty-two percent of the 260 former participants who received welfare when they enrolled in the program reduced the amount of public assistance they received. Though the sample size was adequate, there were some limitations: the report lacks important information regarding research design and procedures. Most notably, information on sample selection was omitted. The programs from which research subjects were drawn were selected because they reportedly met high standards. Thus, the sample was not representative. The study lacked a comparison or control group and presumably, most findings were based on self-report (Beder, 1999).

Summary

Based on the case analyses of the above outcome of participation studies, how effective is the adult literacy education program in the United States? One of the contradictions in outcome measurement is that detailed qualitative studies such as those reported above show that learners do report literacy gains that are important to their lives, whereas studies that use standardized tests such as the TABE tend to show small, and in some cases no gains. The reason may be that many of the personally important gains learners achieved were too small to be recorded on standardized tests (Fingeret, 1985). This may be especially true for beginning readers. For example, Heath (1983) noted the important impact of being able to write a simple memory list or note to one's children for adults who could not previously perform these tasks. Yet, despite the impact on learners' lives, these gains would probably not register on most standardized tests.

The Government Accounting Office report (GAO-03-589: April, 2003) to Congress on “Multiple Employment and Training Programs” indicated that most adults, who enrolled in community ABE/GED programs for the fiscal 1999 and 2002, did so for employment counseling and assessment purposes. For fiscal year 2002, about 85 percent of the adults enrolled for employment counseling and assessment; 80 percent for job search/job placement activities; about 78 percent did so for job readiness skills, job referrals, and occupation or vocational training. On the other hand, about 68 percent adults enrolled for GED assistance and other education leading to high school diplomas (GAO, 2003 p. 16).

Whereas Community ABE/GED participants enter the program for employment related reasons, Even Start family literacy program participants enroll into the program primarily to further their education (St. Pierre et. al., 2003). Even Start parents who enrolled in 2000-2001 did so for the following reasons: self-improvement; further education (to acquire a GED); desire to improve themselves, including learning English; to improve their chances of getting a job; to improve life for their children; and to become a better parent and teacher of their child (St. Pierre et. al., 2003). The above analyses showed that participants for the community ABE/GED and family literacy programs enter these programs with different expectations, which may reflect on the individual exit goal and program outcomes.

Finally, Kassab, Askov, Weirauch, Grinder, & Van Horn, (2004) reported that adult learners who accumulate between 50 and 99 hours of adult education in family literacy programs within a single 12-month period performed better on the TABE reading, while at least 75 hours are needed in order to perform better on the TABE mathematics post-test. Furthermore, women who were working on their English literacy skills and were in the program for longer periods did better on the BEST post-test, than women who were not in the program for as long.

Strengths and Weaknesses of the Literature

The current literature has made some significant strides in determining how social capital contributes to educational attainment and achievement. However, almost all of these studies focus on the conceptualization of social capital as norms rather than access to institutional resources. In addition, methodological gaps in the conceptualization and measurement of social capital, including the reliance on cross-sectional data, hamper the utility of the concept as an explanatory variable in education (Dika & Singh, 2002). Therefore, the need for further exploration of the relationships among these variables is evident, especially, in adult basic education programs. Social capital is increasingly proposed by political and educational leaders as a solution to persistent educational and social problems (Dika & Singh, 2002), and in turn it becomes increasingly important to critically examine the existing literature to determine the role(s) social capital may play in educational and psychological development of adults.

While most of the studies indicate that social capital is indeed positively associated with educational achievement, the studies by McNeal (1999) and Stanton-Salazar and Dornbusch (1995) raise questions about the direction and nature of the relationship between these variables. McNeal suggested that parent involvement and monitoring may have a greater influence on behavioral than on cognitive outcomes. Stanton-Salazar and Dornbusch proposed that grades and educational aspirations are related to the formation of institutional ties. These questions, certainly, deserve more research attention, and have the potential to increase understanding of the complex role and place of social capital in educational achievement.

Applying Theoretical Framework to ABE Programs

What is social capital? "It is not what you know, it's who you know" (Woolcock & Narayan, 2000). This common aphorism sums up much of the conventional wisdom regarding social capital. It is wisdom born of experience - that gaining membership to exclusive clubs requires inside contacts, that close competitions for jobs and contracts are usually won by those with friends in high places. When people fall on hard times, they know that their friends and family constitute the final safety net. Conscientious parents devote hours to the school board and to helping their children with homework, only too aware that a child's intelligence and motivation are not enough to ensure a bright future. Some of our happiest and most rewarding hours are spent talking with neighbors, sharing meals with friends, participating in religious gatherings, and volunteering for community projects (Woolcock & Narayan, 2000). Simply put, social capital is "what you know (human capital) plus whom you know."

The adult, for example, may have a GED or an employable skill but s/he may lack the more diffuse and extensive "bridging" social capital deployed by friends in "high places." That may be church affiliation, family and friends, community networks, and institutions to "get by." This approach allows the argument that the combination of the human capital and social capital are responsible for the range of individual adult's success in education and/or employment. That is, high levels of human capital investment alone do not necessarily augment economic prosperity. The poor, for instance, may have a close-knit and intensive stock of "bonding" human capital investment that they can leverage to "get by," but they may lack the more diffuse and extensive "bridging" social capital deployed by the non-poor or the well-situated to "get ahead" (Holzmann & Jorgensen, 1999; Kozel & Parker, 2000; Narayan, 1997).

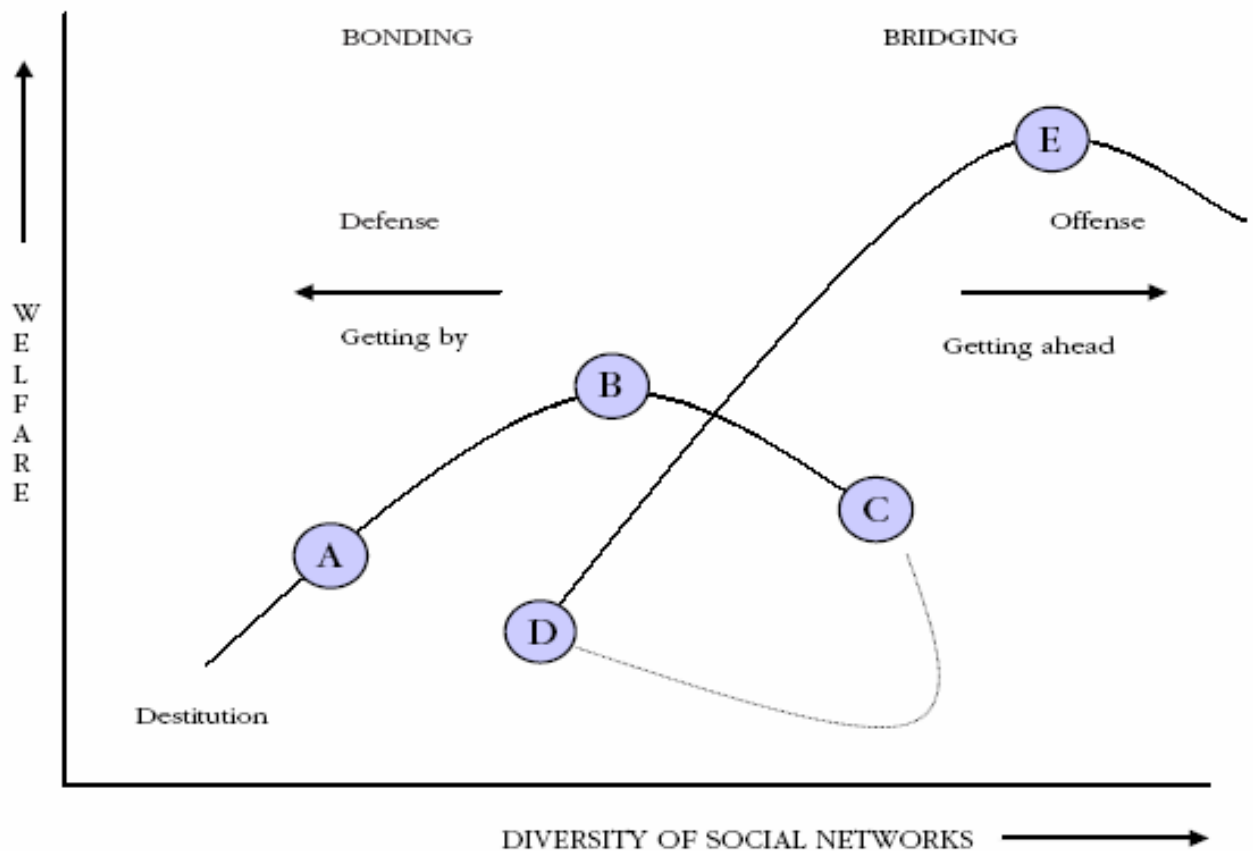
The Network View

The network view on social capital attempts to account for both its upside and its downside, stresses the importance of vertical as well as horizontal associations between people and of relations within and among such organizational entities as community groups and firms. Strong intra-community ties give families and communities a sense of identity and common purpose (Astone, et al., 1999). This view also stresses, however, that without weak intercommunity ties, such as those that cross various social divides based on religion, class, ethnicity, gender, and socioeconomic status, strong horizontal ties can become a basis for the pursuit of narrow sectarian interests. The former has been called “bonding” and the latter “bridging” social capital (Gittell & Vidal 1998). Different combinations of these dimensions, it is argued, are responsible for the range of outcomes that can be attributed to social capital.

Relating to my research questions, Figure 1 shows that as the social networks of the poor become more diverse, so too does their welfare. The social capital residing in a given network can be leveraged or used more efficiently, which is essentially the genius of peer group interaction as embedded in the family literacy adult basic education program. The individual adult with minimal basic skills learns literacy and employable skills by participating in family literacy programs. This basic skills acquisition helps the adult to expand her human capital and thereby improve her family's welfare (A). However, the economic returns on mere human capital investments soon reach a limit (B), especially when they rely on high endowments of human capital investment. If the individual adult continues to expand - for example, through further education - her resources may become overwhelmed, thereby reducing the wellbeing of long-established investment (C). At this level, diminishing returns set in; that is, the individual may be

"underemployed" or "unemployed" due to "overqualification." In these circumstances, many individuals partially divest themselves of their immediate community ties (D) and find a potentially more diverse network where "bridging" social capital is more abundant and economic opportunities more promising (E). Migration from villages to cities, belonging to a community, or a religious group is the most dramatic example of this situation.

Figure 1. *Social Capital and Poverty Transitions*



Source: Woolcock (2000).

The current research builds on the assumptions that adult basic education (a component of the family literacy program) builds social capital in the community at another level. Unlike the

Community stand-alone ABE/GED programs, family literacy ABE contributes to the development of social capital through the design and implementation of its programs. It does this first by calling on existing networks in the community and, second, by generating new networks or connections (Balatti & Falk, 2002).

The following section details the various reasons adult learners give for not participating in education programs by comparing United States of America and United Kingdom.

Comparative and International Education Section

Assumptions and Barriers to Participation:

Significant differences exist between the "barriers" identified by adult learners in the United States and the United Kingdom, however they are equally inhibiting. Barriers to participation in adult education could be "time," "cost," or even perceived social distance, the concept of a "long way" (Thomas, 1995), and opportunity cost (i.e. participants' net-income may be decreased because of foregone earnings during program participation). Researchers use the term "barriers" to refer to factors that discourage or prevent participation in adult education.

Rationale for Countries Selected

My rationale for comparing these countries are as follows: like the United States (or North America), there is growing body of evidence suggesting that the United Kingdom has a

bigger problem with inadequate skills among both young people and adults than any other industrialized country except the U.S (The National Literacy Trust, 2005). Family literacy, which originated from the United States, was successfully transported to the United Kingdom, within the emergent literacy tradition (Hall, 1987). In addition, these two countries are both developed and have similar or comparable infrastructure systems.

United States (North America) Perspectives

Cross (1986) has suggested that adult basic education (ABE) learners, like all adult learners, must overcome three barriers to enroll and stay in ABE. Her suggestions were based on the works of Johnstone and Rivera (1965). Johnstone and Rivera (1965) summarized ten potential barriers into two main categories: external or situational barriers, which are "influences more or less external to the individual or least beyond the individual's control" (p. 214), such as cost; and internal or dispositional barriers, which reflect personal attitude such as thinking too old to learn. Valentine (1997) revealed that situational barriers affect both men and women. In addition to situational and dispositional barriers, Cross (1986) added another cluster: institutional barriers, consisting of "all those practices and procedures that exclude or discourage working adults from participating in educational activities" (p. 98).

Darkenwald and Merriam (1982) also cited institutional and situational barriers, however, they divided the dispositional barriers into psychosocial obstacles (such as, beliefs, values, attitudes, and perceptions about education or about oneself as a learner), and informational, which reflects the lack of awareness as to what educational opportunities are available. Valentine and Darkenwald (1990) developed a scale of deterrents to participation (DPS) that can be a

factor analyzed to reveal the structure of reasons underlying nonparticipation. The DPS revealed five factors of non-participation: personal problems, lack of confidence, educational costs, lack of interest in organized education generally, or lack of interest in available courses.

Beder's (1991) review of essential factors that influence adults' decision to participate in adult education mentioned personal motivation as a factor that helps adults overcome many roadblocks to participation. His studies and others point to perceptions by some adults that they may not: benefit from participation in education program; be able to learn; enjoy participation in formal learning programs; or be able to overcome the many barriers to participation (Hayes, 1988). Tracy-Mumford (1994) focused on retention and suggested the importance of adequate information, intake and orientation, continuous assessment, recognizing student achievement, counseling, student support services, extracurricular activities, evaluation, child care and transportation, staff quality, and retention teams. Her plan emphasized keeping learners in programs until they achieve their goals.

Quigley (1995), however, remarked that most dropouts happened in the first few weeks of program participation; "reluctant learners" who dropped out after the first few weeks were younger and loners who felt they did not receive enough teacher attention. Quigley believed that adults have overcome both situational and institutional barriers; however, in considering dispositional influences, he suggested that a student's history of negative school experience should be discussed earlier during the intake and orientation processes, as a way to ensure greater participation and persistence.

The United Kingdom Perspectives

In this perspective, four factors relating to barriers to participation in adult and continuous education are mentioned (Thomas, 2001). The first category pertains to features of the formal education sector; second category relates to the impacts of the labor market and unemployment (economy). The third category describes the influence of the social and cultural factors on participation; and the fourth category depicts the individual attributes to non-participation. These four factors work together to limit participation; however, I will focus on the first category: "features of the formal education sector"

The experiences and processes of the formal education contribute to the image learners have of themselves and how they relate to formal structures of school. It is, therefore, vital that schools will enable students to maximize their achievement, build on their confidence and encourage them to progress (Thomas, 2001). However, there is a common belief that adult learners from a disadvantaged social backgrounds or bad school experience fare somewhat poorly within formal education system. George Papadopoulos (formal Deputy Director for Education in the Organization for Economic Co-operation and Development [OECD]) noted that, "despite the moral and economic arguments for democratization of higher education (and further education), governments have so far largely failed to achieve this goal" (OECD, 2000, p. 33). He continues that, "educational disadvantage is strongly rooted in socioeconomic disadvantage," and that, "those who benefit from post-compulsory education, in whatever setting, are those who are already well-educated" (p. 35).

Clark (1996) mentioned the importance of "opportunity structures" that shape the thinking of young people in relation to jobs and careers, and the way that education can reinforce

social expectations and stereotypes. The direct and indirect costs of education can provide a major barrier to adult learners from low-income groups. In addition, Kennedy (1997) reported that in further education the "confusion and uncertainty which surround financial support for students create significant barriers to entering and staying in learning for those whose need is greatest" (p. 72). According to Banks and Bryn (1990), reasons found for low take-up rate include the ignorance of the existence of opportunities, and incomplete/inaccurate information. Negative perceptions of such courses include: ineffectiveness as 'stepping stones' to jobs; insufficient increase in benefits; and 'slave labor' exploitation. Generally, the perceived costs of participation exceed the potential perceived benefits.

Istance, Morris, and Rees, (1996) described the barriers reported by both participants and non-participants, focusing on non-participating women with dependent children and unemployed males. Barriers perceived by participants include age, family responsibilities, transport and cost. Barriers to non-participants include limited information - particularly on types of courses available - and confusion/intimidation about where to go to get information. Those who said they did not wish to participate stated lack of confidence, time or socio-economic irrelevance of education as reasons. Women with dependent children saw lack of childcare as most significant. However, the factor that distinguished most successfully between participants and non-participants was identified as the accessibility of course provision.

According to McGivney (1990; 1992; and 1994), barriers to participation are categorized into 'situational', 'institutional' and 'dispositional', after the work of Cross (1986). Some interesting points noted by McGivney (1990) included: 'contradictory' evidence on time and costs as barriers; and class and peer group pressures. Main conclusions were that: the education system was too elitist; there was limited knowledge of opportunities; learning was seen as being

for younger, affluent intellectual individuals; and anger and hostility existed towards class based values of the system. Overall the major barriers were attitudes, perceptions and expectations which were most difficult to change when related to gender roles or social class.

McGivney (1992) examined the lack of motivation to take up education and training amongst unskilled and semi-skilled workers, finding that it was seen as irrelevant to their work or promotion prospects. Noting how working people participated more than unemployed, she went on to investigate the role of unemployment in some detail. The main consequences included: a progressive loss of confidence/self-esteem; deterioration of personal and social skills; growing social isolation; and, particularly, a perceived inability to initiate or control future events. As to the perceived 'risks', the risk to benefit entitlement was found to be the most powerful disincentive. Finally, McGivney (1994) looked at the commonalities of women's experiences despite differences due to race, age, class, educational background and so on. The key obstacles described were classified as: personal and domestic constraints; dispositional constraints, structural constraints; practical and material constraints; and cultural constraints. The findings were well summed up in McGivney's conclusion that multiple barriers that deter women stem from deep-rooted cultural attitudes and expectations underpinned by social and economic structures and policies.

Section Summary

Comparing these two countries, it was evident that "barriers" such as: lack of time, access to information, transportation, opportunity structures, and child-care problems had dominated

among the many reasons why adult learners do not participate in ABE. Skills and Education Network (August, 2004) publication identified three categories of "barriers:" physical, attitudinal, and structural. Attitudinal barriers are often the hardest to overcome. They might include being nervous about going back to the classroom and concern about not being able to keep up; negative perceptions of schooling and skepticism about the value of learning; low self-esteem and lack of confidence both generally and in relation to learning; low aspirations and lack of role models; lack of trust in 'officialdom' and formal institutions or organizations; and age - one in five non-learners think they are too old to learn. Attitudinal barriers are often referred to as "dispositional barriers" (Cross, 1986; McGivney, 1990). On "dispositional barriers," Quigley (1995) said that if ABE programs could see the difference between their learners' disposition and that of the programs they could become more effective at tutoring, teaching, counseling, and retention.

CHAPTER THREE

DATA AND METHODS

The purpose of this study was to investigate the relationship of adult basic education program participation and learner outcome in a family literacy model and a stand-alone community ABE program. This study hypothesizes that the family literacy program emphasizes active learning through social interaction, which promotes bonding and bridging social capital; and that participating in family literacy programs enhances learners' achievement test scores. This chapter presents the research methodology adopted to investigate the conceptual model and to test the research questions presented in Chapter One. The analysis tested patterns of relationships among potential social capital indicators including the length of time adults participate in the adult basic education programs, and the resulting educational outcome. The chapter contains an explanation of the population and sampling, data collection, study design and variables, and the procedure to test the model.

Population and Sampling

The Pennsylvania Bureau of Adult Basic Education (ABLE) oversees the delivery of a broad range of instructional services that aim to address the needs of adults in Pennsylvania who have low literacy skills. The ABLE Bureau funds about 180 agencies in Pennsylvania that offer about 940 programs throughout the state. Services are provided by a range of agencies including

libraries, local education agencies, literacy councils, state correctional institutions, community colleges, community-based organizations, faith-based organizations, and universities.

Within the above general categories, some instruction is focused on addressing the needs of specific populations: family literacy education addresses the needs of about 3,700 adult students, and over 4,000 children; English language and civics education addresses the needs of about 3,200 adult students. Workplace and workforce education addresses the needs of about 1,900 adult students; and distance-learning education addresses the needs of over 900 adult students (PA- ABLE, 2005). The sampling frame included all adult students enrolled in adult basic education program for both family literacy model and stand-alone model for the program year 2002/03.

Data Collection

The Pennsylvania Department of Education, Adult Basic and Literacy Education (ABLE) provides the data to be used in this study. The initial contact for the request of the data was made in March 2005. With the consent of my advisor, Dr. Eunice Askov (Distinguished Professor), I wrote a mini-proposal requesting permission to use the PA-ABLE data for this research study. Permission was granted in June 2005, by the Bureau's director (see Correspondence in Appendix A). The data for this study pertain to ABLE's 2002/03 program year.

The Bureau of ABLE uses new *e-data* system to collect adult basic education and family literacy student information (Hinman & Stump, 2003). All data required by ABLE is tracked in the *e-data* system, which was designed to meet the data needs of the ABLE Bureau and its funded agencies. Agencies can create reports on agency-wide data, on specific contract data, or

on the data selected through keywords. Using *e-data* exports allows agencies to view complete tables of data and eliminates the need to check data screen by screen within the system. *E-data* exports are automatically created in Microsoft Excel, and are stored on a secure server accessible by the ABLE Bureau. Students' enrolments and exits and activities reports are imported into this data bank.

Adult students enroll into the programs by completing "Adult Maintenance - Intake and Exit" form. Information contained in this form are separated into different categories: student name and address; area (rural or urban); gender; ethnicity; adult status; highest grade completed; demographics; and public assistance statuses. It also contains detailed information about students labor force status; date enrolled and core goals; family income category; and exit date.

The built-in reports and exporting capabilities of the *e-data* were designed to assist agencies with local data management; and provide agencies with information on their performance compared with standards, program progress, and National Reporting System data.

Reliability and Validity Analyses

The National Reporting System (NRS) data (see Appendix B) quality standards identify the policies, processes and materials that states and local programs should have in place to collect valid and reliable data for the NRS. The Division of Adult Education and Literacy (DAEL) within the Office of Vocational and Adult Education developed the standards to define the characteristics of high quality state and local data collection systems for the NRS. The standards provide an organized way for DAEL to understand the quality of NRS data collection within the states and provide guidance to states on how to improve their systems. States are to complete a quality checklist, which incorporates the standards, with their annual NRS data

submission to rate their level of implementation of the standards. The National Reporting System is designed to allow a nationally consistent means of reporting student outcomes from accredited and non-accredited curriculum. To promote consistency across curricula and across learning sites, it is assumed that, for assessment purposes, the following conditions will have been met:

- ✓ Assessment tasks should be grounded in a relevant context and not be culturally biased.
- ✓ Students should be assessed across a wide range of tasks integrated into practice, in order to increase reliability and validity of assessment.
- ✓ Instructions for assessment tasks should be clear, explicit and ordered. Students must know what is expected, and the criteria by which they will be judged.
- ✓ Time allowed to complete a task should be reasonable and specified, and should allow for preparation and re-drafting as appropriate to the task.
- ✓ Assessment should ideally be moderated by more than one teacher, and/or across providers.
- ✓ Appropriate reference materials should be available to students during assessment, e.g. personal word lists, dictionaries, thesaurus, calculators (NRS, 2002).

Study Design

This study employs a retrospective *ex post facto* design. Retrospective *ex post facto* studies are characterized by the treatment and outcome having already occurred at the time of study initiation. An *ex post facto* designs or "causal-comparative research designs" do not employ random assignment or random selection and consequently are threatened by potential

confounding variables. Thus, without random assignment and the manipulation of the treatment and independent variable, the analytic models are susceptible to the model misspecification that results from failing to include an important variable or incorrectly including a variable (Campbell & Stanley, 1966; Cook & Campbell, 1979; Gay, 1981). This type of study is used when experimental research is not possible; in this case the basic skills learners have self-selected themselves into the two type ABE programs. Kerlinger (1986) used the term "nonexperimental" research to represent "ex post facto" study design. He defined the inclusive term "nonexperimental" research this way:

Nonexperimental research is systematic empirical inquiry in which the scientist does not have direct control of independent variables because their manifestations have already occurred or because they are inherently not manipulable. Inferences about relations among variables are made, without direct intervention, from concomitant variation of independent and dependent variables (p.348).

An ex post facto research design was chosen as most appropriate for this study because, like most other educational research, the variables that are of great interest to this study are not amenable to "true experimental" research design. For instance, adult students cannot randomly be assigned to Even Start programs or Community ABE/GED programs; they do self-select themselves into these different models of ABE programs. In other instances, eligibility criteria based on income, need, goal of the adult (either employment specific or education specific), number of children and age limit, and state or federal regulations determine which specific program a student is allowed to enroll. This type of study is very common and useful when using human subjects in real-world situations and the investigator comes in "after the fact" (Diem, 1999).

Variables to Measure

The research questions addressed in this study are: 1a) Do Community ABE/GED and Even Start family literacy programs differ given students' reading scores as measured by TABE, CASAS, and GED? 1b) Do Community ABE/GED and Even Start family literacy programs differ given students' mathematics scores as measured by TABE, CASAS, and GED? 2a) If programs vary randomly given reading scores, does type of program explain the variance? 2b) If programs vary randomly given mathematics scores, does type of program explain the variance? 3a) Do family literacy adult basic education programs with high bonding and bridging social capital also have higher learner achievement than stand-alone Community ABE/GED programs? 3b) Does the length of time participating in the family literacy programs with bridging social capital influence adult literacy skills assessment scores? 4a) For the Community ABE/GED programs, do mean hours of instruction and meanSES predict students' reading and mathematics scores? 4b) For the Family Literacy programs, do mean hours of instruction and meanSES predict students' reading and mathematics scores? 5) Do the Pennsylvania ABE programs differ significantly from the national ABE programs? and 6) Are there similarities between the family literacy programs in Pennsylvania (U.S.) and the family learning programs in Lancashire (UK)?

Independent Variables

The first question addresses the issue of "*persistence*" in participation; the second question addresses "*duration*" of participation; and the third question addresses potential "*social capital*" indicators in participation.

Persistence in participation: Web dictionary defines persistence as “continuance of an effect after the cause is removed.” Adult learner persistence in this study was a potential "predictor" variable, and is defined as the *"time in class based on attendance records"* (Quigley, 1997; Comings et al, 1999). Comings, Parrella, and Soricone (1999) studies posited that about half of those who enroll in ABE classes drop out within 10 weeks. The median length of instruction for adult secondary education students is just eight weeks. They defined persistence as:

"Adults staying in programs for as long as they can, engaging in self-directed study when they must drop out of their programs, and returning to a program as soon as the demands of their lives allow." (p. 13)

The authors continued to assert that for the purposes of research in adult education, "persistence is usually measured as participation in formal classes or one-on-one tutoring sessions. The more inclusive definition of persistence used here is more difficult to measure. Although time in class or in tutoring may not be meaningful for an individual student, it is probably a good measure of persistence for comparison between populations of adult students, which makes it useful for research into factors that support or inhibit persistence. Research into persistence must depend on measures that can be collected, and time in class or in tutoring is the only effective measure available at this time" (pp 13, 14).

Duration of participation: Duration is an amount of time or a particular time interval. Duration of participation in this study was a potential "predictor" variable. Kassab, Askov, Weirauch, Grinder, & Van Horn, (2004) defined duration in family literacy programs as the *"number of days"* in the program. According to Kassab et al., continuing participation, duration or number of days in the program was related to TABE mathematics and BEST Literacy Skills posttest scores.

Their research findings suggested that a certain number of adult basic education hours are needed during a program year in order to score at a certain level on posttest. The critical range is between 50 and 99 hours of adult education during a program year. Minimal benefits occur on the TABE reading with continued participation (Kassab et al., 2004)

Social capital indicators in participation: Social capital indicators in participation was a potential "predictor" variable in this study. Dika and Singh (2002) reported that social capital indicators and indicators of educational attainment are positively linked. According to their synthesis, educational participation and grades were positively associated with learner outcomes. Stanton-Salazar and Dornbusch (1995) studied institutional-based social capital as an outcome of grades. Grades were positively related to three different informational network variables: number of school-based weak ties, number of non-kin weak ties, and proportion of non-Mexican origin members. Granovetter (1973) hypothesized that weak ties to other social circles provide access to social capital for instrumental action, whereas social capital within one's own circle is homophilous (i.e., involving people who tend to be alike).

In this study, social capital was a "**binary variable**," a qualitative predictor with only two possible values (yes or no). That is 1, if individual adult student received "social capital based instruction," and 0, if individual adult student did not receive "social capital based instruction."

Socioeconomic status (SES): Non-Caucasian and native-born adults with low literacy skills who participate in adult basic and literacy education tend to be of low socioeconomic status. Many ESOL (English as a second official language) students often have limited schooling in their native languages, and they also lack literacy skills. Another group with low literacy skills comprises individuals with learning disability (LD). It has been estimated that up to 50 percent of

adult basic and literacy education students have LD (Tuijnman, 2000). The following socio-economic factors influence participation in ABE programs: labor force status, public assistance, household status, entry income, gender, ethnicity, parent-child relationship, and residential factors. The Early Childhood Longitudinal Study found the following for kindergartners in the fall of 1998, that: 46% of parents read to their children every day; 62% of parents with a high socioeconomic status read to their children every day, compared to 36% of parents with a low socioeconomic status (Coley, 2002).

The study also found that of the children who were read to at least three times a week as they entered kindergarten: 76% had mastered the letter-sound relationship at the beginning of words, compared to 64% of children who were read to fewer than 3 times a week; 57% had mastered the letter-sound relationship at the end of words, compared to 43% who were read to fewer than 3 times a week; 15% had sight-word recognition skills, compared to 8% who were read to fewer than 3 times a week; and 5% could understand words in context, compared to 2% who were read to fewer than 3 times a week (Denton and West, 2002). It also found that in spring 2000 the children who were read to at least three times a week by a family member were almost twice more likely to score in the top 25% in reading than children who were read to less than 3 times a week. A literacy promotion study, conducted in 1996 in a primary care setting with low-income Hispanic parents of healthy 5-11 month old infants found that the odds of parents reading to their child three or more days a week were 10 times greater in the intervention families than the control families. Parents in the intervention were six times more likely than were control parents to report that one of their three favorite activities with their child was reading books (Golova et al., 1999).

Socio-economic status was defined in this study to be a composite measure of social class of low/high income level plus area of student residence (rural/urban) (Bryk & Raudenbush, 1992; Raudenbush & Bryk, 2002).

Dependent Variables

The potential "response" variables in this study were tests scores of the *TABE*, *CASAS*, and *GED* subtests (reading skills, total mathematics, and listening skills). A synthesis of the methods and findings from more than 100 local evaluation reports was prepared by St.Pierre, Ricciuti & Creps (1999). In 2000-2001, 80 percent or more of all Even Start projects conducted local evaluation activities, including: interviews or meetings with project staff, project participants, project administrators, and collaborating agencies, tests of adults and children, and observations in early childhood classrooms. Project directors were asked about the kinds of adult assessments that were administered during the year, for diagnostic, placement or evaluation purposes. By far the most popular assessment was the *TABE* (Tests of Adult Basic Education), which was used by 73 percent of all projects. Although some projects administered the *CASAS* (Comprehensive Adult Student Assessment System) and others, none of these tests for adults was used by more than one-third of the projects.

However, the National Evaluation of Adult Education Programs (Development Associates, 1993) reported that ABE programs that tested regularly reported using numerous standardized testing instruments, ranging from the Test of Adult Basic Education (*TABE*), Slosson Oral Reading Test (*SORT*), Adult Basic Learning Examination (*ABLE*), Wide Range

Achievement Test (WRAT), Comprehensive Adult Student Assessment System (CASAS), and many locally developed tests.

An appropriate measure of learning gain must reflect what is taught in instruction, which can vary widely among programs and states. An example that highlighted the problem is the fact that many states require all ABE programs to pretest and posttest using a standardized test, the TABE being the most commonly used measure. Nevertheless, although the TABE may be an appropriate measure for programs that use a generalized approach, it is not appropriate for those programs that gear towards a contextualized instruction (Beder, 1999). TABE assesses academic skills not functional skills. This study, however, employed the combination of CASAS and TABE post-test scores and GED “actual-test” scores (for reading skills, mathematics skills, and the listening skills) as the dependent variables

Analytical Method

To investigate the differences between the stand-alone Community ABE/GED and Even Start family literacy programs, the hierarchical linear regression model (HLM) was used. HLM deals with the analysis of data where observations are nested within groups. It creates more accurate models when working with nested-structure data. In ABE programs, students are grouped in classes; classes are grouped in programs; and programs in agency levels. Therefore, there were variables that described individual students, but the individual students were grouped into programs, which had higher-order agency units. This study identified lower-level units or students level to be level-1, and a unique higher-level units or programs level to be level-2.

In the hierarchical linear regression model, the level-1, or learner-level model, was developed using the scores from the TABE, CASAS, and GED subtests (reading and mathematics skills; listening scores were deleted as there were not enough cases to do the modeling) as the dependent variables and instructional hours and socioeconomic factors (SES) as the independent variable. In analyzing the level-2, or program level model, the reading scores and mathematics scores were the dependent variables and the MEANSES, MEANPROGRAM SIZE, AND MEANINSTRUCTIONAL HOURS were the independent variables.

Hierarchical linear regression model is an extension of the multiple regression model. It is known in the sociological research literature under variety of names, such as multilevel linear models (Goldstein, 1995) or hierarchical-linear model (Bryk & Raudenbush, 1992). The HLM procedure expands the general linear model so that one can analyze data that exhibit correlation and non-constant variability. SAS, SPSS, and other parametric and non-parametric statistics including ANOVA and Correlation statistics were used to analyze the data for this research. The rationale for using HLM was that it provided accurate estimates of relationships among nested or clustered variables like the Adult Basic Education program. In a traditional ABE program, students (learners) are nested in schools (programs) and programs in communities. By using HLM, researchers can: fit a regression equation at the lowest level and let parameters of the regression equation vary by group membership. They can use higher-level variables to explain variation in the lower-level parameters and test for main effects and interactions, both within and between levels (Aitkin et al., 1981; Goldstein, 1997; Bryk & Raudenbush, 1992; Raudenbush & Bryk, 2002; Cohen & Cohen, 1983).

Nested data structures are problematic in nature for researchers. There are two common fallacies that can occur resulting from making inferences based on a single level of nested data:

Individual fallacy can occur when inferences are made about a group based solely on individual data; ecological fallacy (Robinson effect) can occur when inferences applied to individuals based exclusively on aggregated group data. HLM provides a nested structure within which the individual-level response can be predicted through both individual level (Level 1) as well as units at a program level (Level 2) (Goldstein, 1997; Raudenbush & Bryk, 2002). HLM can model for variations at several levels that result from populations unique to each level and clustered within the levels, such as adults at the individual level and programs at the group level with adults clustered within programs (Snijders & Bosker, 1999). In a two-level model, the cluster-effect is accounted for at the individual level (Raudenbush & Bryk, 2002).

CHAPTER FOUR

ANALYSIS AND RESULTS OF THE STUDY

This chapter presents the results of the study beginning with a description of the Adult Basic Education programs and variables to be tested, including the sample size selected from the entire study population. It also reviews results obtained by testing the six hypotheses and results of supplementary analyses. This chapter is divided into three sections: section one deals with the overall description of the data, frequency analyses, and primary hypothesis testing. Section one is divided into two parts: part one is the descriptive and frequency analysis for the general study variables and part two is the hierarchical linear modeling analysis. Section two of the analysis compares program to program and the results of this study to National Performance Standards; and section three is a comparative analysis of Pennsylvania (USA) family literacy program results and results from Lancashire (UK) family learning programs. The Lancashire data for analysis (2002/2003 PY) was a survey report taken from the National Institute of Adult and Continuing Education report by Horne and Haggart (NIACE, 2004).

Descriptive Analysis for General Study Variables

ABE Programs

The sample of this study consisted of 7,397 adult basic education students from both Community ABE and Family Literacy programs. Out of the 940 programs, 50.3 percent were ABE Community and Institution programs and 31.1 percent were GED Community and

Institution programs. Nine percent of the total programs were for Even Start and Family Literacy programs, while the remaining 9.6 percent were Literacy Corp, ESL Civic, and PA WIN (Pennsylvania Workforce Improvement Network) programs. Table 1 summarizes the demographic data of this sample. Fifty seven percent of the students from the sample were female and 43 percent were male. Ethnic backgrounds of the students were composed of 42.3 percent Caucasian, 36.8 percent African American, and 14.6 percent Hispanic.

Table 1

Frequency Distribution* for Gender, Ethnicity, and Area

	<i>f</i>	Sample** Percent
<u>Gender</u>		
Female	4194	56.7
Male	3203	43.3
<u>Ethnicity</u>		
White	3127	42.3
Black	2723	36.8
Hispanic	1080	14.6
Asian	458	6.2
Other***	9	.1
<u>Area</u>		
Rural	2544	34.4
Urban	4853	65.6

* Population total = 71962

** Sample Size = 7397

***Other = Native American, Pacific Islander

Descriptive Statistics for Main Study Variables

Six percent of the students were Asians and one percent comprised of other ethnicity, which is made up of Native Americans and Pacific Islanders. Majority of PA-ABE program students were urban dwellers (65.6 percent) and 34.4 percent of the students resided in rural areas. Table 2 presents minimum, maximum, means, and standard deviations for the main study variables for 7397 students.

Table 2

Descriptive Statistics

	Min	Max	Mean	Std. Dev
Instructional Hours	80	1128	146.246	86.454
Standardized Test Scores	200	710	449.729	135.671
CASAS Test Scores*	153	262	216.419	18.702
GED Actual Test*	76	726	438.512	126.204
TABE Test Scores*	160	812	532.766	75.514
Reading Skills**	200	710	453.866	134.838
Total Mathematics**	200	665	489.967	97.945
Listening Skills**	200	238	215.269	8.687
Program Size	1	249	127.499	79.809
Household Status***	179	185	180.080	1.317

* CASAS = 1861; GED = 488; TABE = 5006

** reading scores = 4676; total math = 2252; listening skills = 469

*** **Household Status (Code)**

Head of Single Parent Household	(179)
Head of Spouse/Partner in 2 Parent Household	(180)
Head of Spouse/Partner-no dependents	(181)
Dependent member of Household	(182)
Dependent and Single Parent	(183)
Living in Group Quarters	(184)
Living Alone	(185)

The average hours of instruction in adult education that students participated in ABE programs per 2002/2003 program year were 146 hours ($\underline{M} = 146.25$, $\underline{s.d.} = 86.45$). Majority of the students reported that they were head or spouse/partner in two parent household ($\underline{M} = 180$, $\underline{s.d.} = 1.32$), and students had completed about nine to 10 years of schooling at the time of entry into the ABE program. The average scores on standardized test were: CASAS 216 ($\underline{M} = 216.42$, $\underline{s.d.} = 18.70$); GED Actual Test 439 ($\underline{M} = 438.51$, $\underline{s.d.} = 126.20$); and TABE test scores were 533 ($\underline{M} = 532.77$, $\underline{s.d.} = 75.51$). Overall, students' performance according to this study is acceptable within the National Reporting System (NRS, 2005) benchmarks. According to NRS, students performing at these levels are able to read simple descriptions and narratives on familiar subjects or from which new vocabulary can be determined by context. They can also make some minimal inferences about familiar texts and compare and contrast information from such texts but not consistently.

The individual can write simple narrative descriptions and short essays on familiar topics and has consistent use of basic punctuation but makes grammatical errors with complex structures. On numeracy skills, students can perform all four basic math operations with whole numbers and fractions; can determine correct math operations for solving narrative math problems and can convert fractions to decimals and decimals to fractions; and can perform basic operations on fractions. Finally, students are able to function in the workplace and can handle basic life skills tasks such as graphs, charts, and labels and can follow multi-step diagrams; can read authentic materials on familiar topics, such as simple employee handbooks and payroll stubs; can complete forms such as a job application and reconcile a bank statement. They can handle jobs that involve following simple written instructions and diagrams; can read procedural

texts, where the information is supported by diagrams, to remedy a problem, such as locating a problem with a machine or carrying out repairs using a repair manual (NRS, 2005).

Unit of Analysis (Hierarchical Linear Modeling)

Substantial differences exist among adult basic and literacy programs (Condelli & Kutner, 1997). Programs focus on seven categories of outcomes endorsed by state directors: economic impact, credentials, learning gains, family impact, further education and training, community impact, and customer satisfaction (Condelli & Kutner, 1997). Most adult basic education programs are developed as school-based programs, with the school (program) being the unit assigned to experimental conditions and the students (learners) within the program, receiving the intervention. The data structure, therefore, is hierarchical with the learners (level-1 or micro-level) nested within programs (level-2 or macro-level). A multilevel analytical approach that takes interdependence into account in the analytical process integrates the features of the lower (individual level) and higher (program level) order levels of analysis. The specification of appropriate within- and between-program error structures for a simultaneous estimation of all effects allows a more precise, and perhaps optimal, estimation of effects at both individual and school levels (Bryk and Raudenbush, 1992; Goldstein, 1995).

This study used hierarchical linear modeling (HLM) to investigate how adult basic education program characteristics, such as community and socio-economic factors, influenced the learning outcome of ABE programs and to accurately model student performance within programs. HLM analyses were done to address three general research purposes. These are; improved estimation of effects within individual units; formulation and testing of hypotheses

about cross-level effects (varying program size affects the relationship between social class and academic achievement within programs (Raudenbush and Bryk, 2002)); and the partitioning of variation among sets of student-level variables into within- and between-program components.

Multilevel Analyses

The original sample for the level-1 unit was 7,397 (made up of: Community ABE = 6069; Family Literacy = 1,328). The level-2 unit sample was 249 programs from a total of 940 programs. To accurately analyze the research questions using HLM, further data editing were done to eliminate programs that had fewer than five (5) students. Also listening skills scores were deleted from the HLM file due to insufficient cases to do the modeling. Many programs had fewer than five students; however, a value of five students per program was selected as a minimum for running the HLM. Reading scores and mathematics scores were the two main measures and they were analyzed independently in two HLM analyses. For the reading scores, the student sample size was 4525, the program sample size was 121, and at least 5 students were enrolled in each program. The smallest program had 5 students while the largest program had 600 students. Appendix C shows the frequency of students per program. Table 3 lists the descriptive analysis for reading scores.

Table 3

Descriptives: Reading Scores for all Programs CmABE/FL

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum	Between-Component Variance
					Lower Bound	Upper Bound			
101000000000.00	15	543.2000	47.32366	12.21892	516.9930	569.4070	455.00	598.00	
1013033720000.00	36	495.2917	77.11173	12.85196	469.2008	521.3825	255.00	598.00	
1013033900000.00	9	496.5556	47.48384	15.82795	460.0562	533.0549	430.50	579.50	
1020274510000.00	32	519.6563	72.15836	12.75592	493.6404	545.6721	245.00	595.00	
1030000000000.00	22	510.2727	72.80187	15.52141	477.9942	542.5513	354.00	610.50	
1030238070000.00	13	529.9231	32.58696	9.03800	510.2310	549.6152	465.00	569.00	
1044351070000.00	7	521.9286	62.02045	23.44153	464.5692	579.2879	456.00	603.00	
1050000000000.00	52	544.7500	60.86537	8.44051	527.8050	561.6950	411.50	668.50	
1051263010000.00	6	326.0000	179.97972	73.47641	137.1229	514.8771	201.50	585.00	
1052033700000.00	20	523.5000	35.04734	7.83682	507.0973	539.9027	429.00	580.50	
1052047030000.00	71	575.2958	37.11917	4.40523	566.5098	584.0817	455.00	640.50	
1052526020000.00	112	310.0402	148.01692	13.98628	282.3254	337.7549	200.00	627.00	
1052533750000.00	51	521.4118	52.80925	7.39477	506.5589	536.2646	301.00	610.00	
1066172030000.00	8	586.8750	20.99277	7.42207	569.3246	604.4254	554.50	607.00	
1076533840000.00	46	517.4674	57.68963	8.50587	500.3357	534.5991	357.50	617.50	
1080515030000.00	6	577.5833	34.41717	14.05075	541.4647	613.7019	515.50	605.50	
1080705020000.00	37	510.7027	115.73488	19.02670	472.1148	549.2906	222.50	697.50	
1081126070000.00	37	496.1757	116.96529	19.22897	457.1775	535.1738	285.00	694.00	
1081133910000.00	16	449.7188	87.62704	21.90676	403.0256	496.4119	293.00	577.00	
1085633680000.00	12	483.6667	50.41344	14.55311	451.6355	515.6978	365.00	531.00	
1085678070000.00	17	417.0294	109.14833	26.47236	360.9105	473.1483	254.00	589.50	
1090000000000.00	5	561.7000	52.58160	23.51521	496.4113	626.9887	502.50	621.00	
1100000000000.00	27	463.0741	153.23466	29.49002	402.4565	523.6917	201.50	689.50	
1101433880000.00	7	438.6429	35.24878	13.32278	406.0432	471.2425	386.00	499.00	
1101733800000.00	44	456.2727	98.28550	14.81710	426.3912	486.1543	251.00	613.50	
1110000000000.00	46	497.1957	124.61806	18.37393	460.1887	534.2026	216.00	642.00	
1113133850000.00	39	516.8077	64.87930	10.38900	495.7763	537.8391	325.50	617.50	
1113133940000.00	10	504.7000	65.15631	20.60423	458.0900	551.3100	367.00	604.50	
1120000000000.00	96	386.4479	173.96122	17.75484	351.2001	421.6957	204.00	668.00	
1130000000000.00	40	487.6875	101.14984	15.99319	455.3382	520.0368	205.00	606.00	
1133640020000.00	8	262.5625	71.45400	25.26280	202.8255	322.2995	213.00	414.00	
1152133810000.00	5	551.4000	10.03992	4.48999	538.9338	563.8662	543.50	565.50	
1160000000000.00	27	499.0185	65.58780	12.62238	473.0728	524.9642	320.00	580.50	
1164933730000.00	51	541.2647	47.29021	6.62195	527.9641	554.5653	435.00	654.00	

118000000000.00	17	539.9706	63.63113	15.43282	507.2545	572.6867	380.00	644.50
1184033930000.00	9	544.7778	48.28697	16.09566	507.6611	581.8944	442.50	622.00
1193574020000.00	8	553.8750	35.49421	12.54910	524.2011	583.5489	484.00	599.50
1196433950000.00	29	493.0690	75.56616	14.03228	464.3251	521.8128	287.50	612.00
1211315070000.00	8	534.5625	47.18765	16.68335	495.1126	574.0124	453.50	585.00
1220000000000.00	10	541.6500	30.91211	9.77527	519.5368	563.7632	494.50	577.00
1234633830000.00	9	537.3889	40.07164	13.35721	506.5871	568.1907	473.50	615.00
1234656020000.00	14	526.0000	87.50934	23.38785	475.4736	576.5264	318.50	622.00
1250000000000.00	8	530.1875	48.10252	17.00681	489.9728	570.4022	456.00	595.00
1252329100000.00	12	551.2500	29.06849	8.39135	532.7808	569.7192	503.50	607.00
1265150010000.00	185	505.0108	70.43871	5.17876	494.7934	515.2282	264.00	668.00
1280000000000.00	49	346.7653	144.53060	20.64723	305.2513	388.2793	200.00	607.00
1283200010000.00	23	488.8261	60.41158	12.59669	462.7022	514.9500	365.50	573.00
1290000000000.00	13	324.3077	157.92028	43.79920	228.8774	419.7380	204.00	584.50
1295433740000.00	8	514.0625	34.38068	12.15541	485.3195	542.8055	463.00	554.50
1295433920000.00	10	504.5500	41.55950	13.14227	474.8201	534.2799	410.00	548.50
2026265000000.00	8	529.4375	31.45909	11.12247	503.1370	555.7380	468.00	568.00
2027528010000.00	7	484.7857	69.18806	26.15063	420.7974	548.7740	338.00	542.00
2135137255000.00	14	457.5357	137.61310	36.77865	378.0803	536.9911	200.50	607.00
2152214530000.00	47	221.5000	11.03896	1.61020	218.2588	224.7412	200.50	240.50
3000244400000.00	57	403.6053	129.28056	17.12363	369.3025	437.9080	206.50	631.50
3000245000000.00	74	484.2230	89.63473	10.41983	463.4563	504.9897	246.00	622.00
3000633300000.00	38	231.2105	54.12306	8.77992	213.4207	249.0003	202.00	547.00
3000930500000.00	10	518.4500	97.99304	30.98812	448.3500	588.5500	276.00	621.00
3001509600000.00	16	516.0938	75.96583	18.99146	475.6144	556.5731	374.50	654.00
3002007400000.00	5	429.0000	114.96249	51.41279	286.2552	571.7448	318.00	601.00
3002106400000.00	13	496.8846	79.84677	22.14551	448.6337	545.1355	337.00	616.50
3002219900000.00	43	557.8140	82.71084	12.61329	532.3593	583.2686	306.50	654.50
3002293200000.00	95	453.6789	130.92053	13.43216	427.0091	480.3488	202.00	636.50
3002323100000.00	22	497.8182	81.86379	17.45342	461.5218	534.1146	298.00	617.50
3002506000000.00	17	209.1176	9.33496	2.26406	204.3181	213.9172	200.50	235.00
3002530000000.00	103	530.6748	54.45815	5.36592	520.0315	541.3180	334.50	668.50
3002555550000.00	5	512.7000	38.26813	17.11403	465.1838	560.2162	469.00	573.00
3002581100000.00	37	467.6757	84.56738	13.90279	439.4795	495.8718	268.00	617.00
3002624100000.00	12	498.2083	95.48738	27.56483	437.5385	558.8781	333.50	592.00
3003102500000.00	9	446.6667	77.28397	25.76132	387.2609	506.0724	284.50	539.00
3003315000000.00	27	576.5556	80.29876	15.45350	544.7904	608.3207	355.00	709.50
3003315100000.00	5	497.6000	53.03702	23.71887	431.7458	563.4542	420.50	558.00
3003563900000.00	8	223.3750	16.95109	5.99311	209.2035	237.5465	201.50	245.00
3003637300000.00	13	224.5385	12.26183	3.40082	217.1287	231.9482	206.50	242.50
3003740600000.00	9	392.8889	143.01831	47.67277	282.9553	502.8225	213.00	553.50
3003906500000.00	23	451.5652	104.74637	21.84113	406.2695	496.8609	250.00	606.00
3004324700000.00	25	528.1200	64.35259	12.87052	501.5566	554.6834	354.50	616.50
3004631300000.00	5	222.5000	14.62019	6.53835	204.3466	240.6534	200.50	236.00
3004634200000.00	5	418.5000	98.37365	43.99403	296.3530	540.6470	316.50	549.00

3004695600000.00	16	546.6563	35.19788	8.79947	527.9006	565.4119	491.50	603.00	
3004815700000.00	6	545.0000	50.19462	20.49187	492.3240	597.6760	464.50	592.50	
3004844700000.00	62	257.4516	97.88299	12.43115	232.5940	282.3092	200.00	566.50	
3005124500000.00	600	502.1008	105.52987	4.30824	493.6397	510.5619	200.00	663.50	
3005127200000.00	26	518.6538	54.15141	10.61997	496.7816	540.5261	359.50	629.50	
3005128300000.00	5	552.9000	57.32953	25.63855	481.7160	624.0840	454.00	596.50	
3005132900000.00	50	515.7700	51.33545	7.25993	501.1806	530.3594	372.00	628.00	
3005137300000.00	20	542.5500	52.51413	11.74252	517.9726	567.1274	458.50	660.50	
3005145100000.00	6	506.6667	97.49598	39.80257	404.3509	608.9824	329.00	592.00	
3005156100000.00	65	510.1077	78.50107	9.73686	490.6561	529.5593	210.00	614.50	
3005157600000.00	76	509.9605	98.42468	11.29009	487.4695	532.4515	223.50	663.50	
3005159300000.00	10	541.4500	57.25695	18.10624	500.4908	582.4092	458.50	631.50	
3005165800000.00	159	523.1164	59.95869	4.75503	513.7247	532.5080	277.00	624.50	
3005183400000.00	16	208.7500	11.91777	2.97944	202.3995	215.1005	200.50	246.00	
3005186200000.00	8	218.4375	13.57108	4.79810	207.0918	229.7832	200.50	238.00	
3005191970000.00	7	491.5714	58.59851	22.14816	437.3768	545.7660	398.50	574.50	
3005193750000.00	14	466.2143	109.61694	29.29636	402.9233	529.5052	272.00	601.50	
3005198000000.00	149	222.7248	9.87805	.80924	221.1257	224.3240	201.50	247.00	
3006335100000.00	18	481.7500	92.76683	21.86535	435.6181	527.8819	256.00	609.00	
3006505900000.00	38	559.8684	86.31563	14.00224	531.4972	588.2397	238.00	689.50	
3006566500000.00	20	551.6250	40.01443	8.94750	532.8977	570.3523	455.50	656.00	
3265100160000.00	66	497.3485	57.91001	7.12823	483.1124	511.5845	321.50	609.00	
3265100170000.00	35	515.5000	53.27026	9.00432	497.2010	533.7990	392.00	601.00	
4020214090000.00	30	520.7833	53.53241	9.77364	500.7940	540.7727	336.50	586.00	
4041008520000.00	23	425.9348	157.31514	32.80247	357.9066	493.9629	204.00	597.00	
4081110070000.00	98	445.5918	64.01797	6.46679	432.7570	458.4266	236.00	583.00	
4101472011080.00	30	498.6000	58.93895	10.76073	476.5918	520.6082	409.00	599.50	
4140677020000.00	66	511.3636	55.57341	6.84061	497.7020	525.0253	367.50	609.50	
4152237520000.00	33	504.6364	69.07924	12.02515	480.1419	529.1308	325.00	595.50	
4175955700000.00	11	512.1818	58.78489	17.72431	472.6896	551.6740	439.00	594.00	
4184054520000.00	60	223.7250	12.80904	1.65364	220.4161	227.0339	202.00	250.50	
4193546060000.00	9	316.4444	57.89454	19.29818	271.9428	360.9461	213.00	409.50	
4193557040000.00	13	554.0000	50.33471	13.96034	523.5830	584.4170	471.00	631.50	
4204866720000.00	264	294.1023	132.55825	8.15840	278.0382	310.1664	200.00	624.00	
4213949520000.00	78	471.7500	72.59319	8.21956	455.3828	488.1172	245.00	607.00	
4252325020000.00	33	514.2727	56.26279	9.79409	494.3228	534.2226	360.50	603.00	
4265120020000.00	61	490.4508	69.10335	8.84778	472.7526	508.1490	242.00	615.50	
9080701550000.00	6	444.6667	138.71470	56.63004	299.0945	590.2388	231.50	594.00	
9170812350000.00	6	406.9167	127.84695	52.19330	272.7495	541.0838	238.00	558.00	
9174115020000.00	17	473.4118	148.53674	36.02545	397.0412	549.7823	207.50	609.00	
9234600340000.00	6	503.8333	32.17556	13.13562	470.0672	537.5995	447.00	538.00	
9241508130000.00	14	489.2143	43.81812	11.71088	463.9145	514.5141	429.00	570.00	
Total	4524	454.8492	134.61520	2.00140	450.9255	458.7730	200.00	709.50	
Model			91.45183	1.35966	452.1836	457.5149			
Fixed Effects				18.19356	418.8273	490.8712			
Random Effects									10084.81664

For the mathematics scores, the student sample size was 2124, the program sample size was 68, and at least 5 students were enrolled in each program. The smallest program had 5 students while the largest program had 145 students. Table 4 describes the descriptive analysis for the mathematics scores. As can be seen in tables 3 and 4, there was a range of mean program scores in reading and in mathematics. It is important to note that the standard deviations by program varied considerably. Multilevel modeling is an appropriate method to analyze program differences given the varied samples sizes of programs and also the range of standard deviations for programs.

Table 4

Descriptives: Mathematics Scores for all Programs CmABE/FL

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum	Between-Component Variance
					Lower Bound	Upper Bound			
101000000000.00	48	539.9583	46.98289	6.78140	526.3159	553.6007	403.00	638.00	
1020274510000.00	66	490.9394	54.51037	6.70976	477.5391	504.3397	350.00	590.00	
1030000000000.00	13	482.0000	91.62696	25.41275	426.6304	537.3696	269.00	590.50	
1030238070000.00	27	488.6667	56.40598	10.85534	466.3532	510.9801	306.00	568.00	
1040000000000.00	14	531.5714	61.35861	16.39878	496.1440	566.9988	349.50	604.00	
1044351070000.00	10	516.3000	59.19844	18.72019	473.9520	558.6480	418.50	589.00	
1050000000000.00	56	535.6071	63.10278	8.43246	518.7081	552.5062	372.00	652.50	
1052526020000.00	60	449.8250	146.43431	18.90459	411.9970	487.6530	219.50	643.00	
1080705020000.00	108	527.9583	56.96228	5.48120	517.0925	538.8242	356.00	659.00	
1081126070000.00	31	512.1935	55.94874	10.04869	491.6714	532.7157	381.00	609.00	
1081133910000.00	32	499.3594	51.24360	9.05868	480.8841	517.8347	369.00	594.00	
1085678070000.00	32	517.5938	76.44199	13.51316	490.0335	545.1540	275.00	606.50	
1090000000000.00	6	514.9167	53.61289	21.88737	458.6534	571.1799	456.00	569.00	
1100000000000.00	47	451.3511	139.45663	20.34184	410.4051	492.2971	219.00	641.50	
1101433880000.00	10	416.7000	56.39651	17.83414	376.3564	457.0436	311.50	500.50	
1110000000000.00	64	449.6953	140.85430	17.60679	414.5110	484.8797	203.00	640.50	
1113133940000.00	15	518.8667	57.89660	14.94884	486.8046	550.9287	380.00	595.50	
1120000000000.00	72	546.7014	45.05464	5.30974	536.1141	557.2887	443.50	642.50	
1126791070000.00	5	484.8000	60.39102	27.00768	409.8146	559.7854	423.00	556.50	
1130000000000.00	59	512.6525	56.58586	7.36685	497.9062	527.3989	343.00	628.50	
1152116030000.00	61	542.0164	44.03635	5.63828	530.7382	553.2946	440.00	621.00	
1160000000000.00	36	520.4167	39.64548	6.60758	507.0026	533.8308	429.00	573.50	
1174133860000.00	8	421.5625	51.81039	18.31774	378.2479	464.8771	336.00	486.50	
1180000000000.00	10	499.0000	59.04189	18.67068	456.7640	541.2360	355.50	553.00	
1196433950000.00	11	501.8182	62.54649	18.85848	459.7989	543.8375	368.50	573.00	
1211315070000.00	12	538.3333	42.21392	12.18611	511.5119	565.1548	463.00	598.50	
1250000000000.00	9	482.6667	83.23874	27.74625	418.6837	546.6496	388.50	624.50	
1265150010000.00	116	510.2241	57.58907	5.34701	499.6327	520.8155	283.00	617.00	
1280000000000.00	28	530.4286	74.89903	14.15459	501.3858	559.4714	334.00	639.50	
1283200010000.00	5	566.5000	56.22611	25.14508	496.6861	636.3139	499.50	634.50	
1290000000000.00	43	314.6047	144.17815	21.98696	270.2332	358.9761	201.00	615.50	
2011361565000.00	5	448.1000	75.41668	33.72736	354.4578	541.7422	337.50	516.50	
3000244400000.00	39	462.5641	98.25532	15.73344	430.7134	494.4148	232.50	594.00	
3000245000000.00	21	506.5952	62.71276	13.68505	478.0487	535.1417	367.00	606.00	

300041480000.00	5	503.2000	67.47740	30.17681	419.4157	586.9843	417.50	605.00	
300200740000.00	9	488.7222	33.76769	11.25590	462.7661	514.6784	446.00	543.50	
300210640000.00	9	530.7778	72.83805	24.27935	474.7895	586.7661	388.00	646.00	
300229320000.00	27	486.5000	76.30808	14.68550	456.3135	516.6865	307.00	604.50	
300232310000.00	5	501.2000	67.65501	30.25624	417.1952	585.2048	435.00	611.50	
300253000000.00	8	514.8750	38.36642	13.56458	482.7999	546.9501	459.00	569.50	
300262410000.00	22	528.8409	45.92758	9.79179	508.4778	549.2041	399.00	607.00	
300310250000.00	5	425.5000	39.22850	17.54352	376.7914	474.2086	373.50	469.00	
300331500000.00	5	561.7000	113.60436	50.80541	420.6416	702.7584	372.00	665.00	
300374060000.00	7	462.9286	114.65653	43.33609	356.8890	568.9682	221.00	562.50	
300390650000.00	8	496.9375	54.99379	19.44324	450.9615	542.9135	430.00	612.00	
300512450000.00	25	559.5800	41.26179	8.25236	542.5480	576.6120	473.50	643.00	
300512720000.00	30	479.9500	65.61635	11.97985	455.4485	504.4515	280.00	595.00	
300512830000.00	15	525.5667	64.28671	16.59876	489.9659	561.1675	345.00	619.00	
300513290000.00	57	507.5175	39.02963	5.16960	497.1616	517.8735	441.50	597.50	
300515760000.00	15	541.1667	39.81146	10.27927	519.1198	563.2135	465.00	615.00	
300515930000.00	14	505.7143	66.44133	17.75719	467.3522	544.0764	397.00	619.50	
300518620000.00	10	217.6500	10.00847	3.16496	210.4904	224.8096	200.50	229.00	
300519375000.00	13	502.9231	71.23373	19.75668	459.8770	545.9692	323.00	593.00	
300633510000.00	11	462.6364	101.65729	30.65083	394.3421	530.9307	256.00	612.00	
300650590000.00	17	493.6176	44.60645	10.81865	470.6831	516.5522	399.00	566.50	
300656650000.00	79	541.4177	49.50029	5.56922	530.3303	552.5052	437.50	660.00	
3265100170000.00	32	495.3906	40.93440	7.23625	480.6322	510.1490	390.00	562.50	
4020209520000.00	7	488.9286	69.44028	26.24596	424.7070	553.1501	339.50	550.00	
4081110070000.00	66	455.2500	67.58973	8.31972	438.6344	471.8656	292.00	594.50	
4101472011080.00	26	506.5962	77.02688	15.10621	475.4843	537.7080	295.00	629.00	
417595570000.00	10	530.8000	39.17709	12.38888	502.7744	558.8256	478.00	599.00	
4184054520000.00	31	226.5323	10.16525	1.82573	222.8036	230.2609	206.00	244.50	
4193546060000.00	6	514.8333	65.01974	26.54420	446.5993	583.0674	437.00	579.50	
4193557040000.00	44	537.4773	52.07139	7.85006	521.6461	553.3084	400.50	617.00	
4204866720000.00	145	423.4172	146.50992	12.16699	399.3683	447.4662	204.50	603.00	
4213949520000.00	80	514.0938	50.46863	5.64256	502.8625	525.3250	320.00	623.00	
4220907520000.00	4	532.7500	42.00893	21.00446	465.9044	599.5956	473.50	568.00	
4252325020000.00	43	493.7558	57.54919	8.77617	476.0448	511.4668	328.50	582.00	
4265120020000.00	55	480.8455	54.75847	7.38363	466.0422	495.6487	367.50	600.00	
Total	2124	490.6655	97.57892	2.11728	486.5133	494.8177	200.50	665.00	
Model									
Fixed Effects			79.71298	1.72962	487.2735	494.0575			
Random Effects				9.60434	471.5003	509.8306			3255.24709

Testing the Hypotheses

Differences between Programs

Hypothesis 1

1a) Community ABE/GED and Even Start family literacy programs do not differ significantly given students' reading scores as measured by TABE, CASAS, and GED.

1b) Community ABE/GED and Even Start family literacy programs do not differ significantly given students' mathematics scores as measured by TABE, CASAS, and GED.

To analyze hypothesis one (1a and 1b), a “One-Way ANOVA with Random Effects” was used. The simplest possible hierarchical linear model is equivalent to a one-way ANOVA with random effects. The one-way ANOVA with random effects provides useful preliminary information about how much variation in the outcome lies within and between programs and about the reliability of each program's sample mean as an estimate of its true population mean. As shown in tables 5 and 6, the means by program were significantly different for reading, $F(120, 4403) = 44.98, p < .0001$; and for mathematics $F(68, 2055) = 16.56, p < .0001$.

Table 5

Results from the One-Way ANOVA Model

Reading Scores for all Programs

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	45138216.369	120	376151.803	44.976	.000
Within Groups	36824212.819	4403	8363.437		
Total	81962429.187	4523			

Table 6

Results from the One-Way ANOVA Model

Mathematics Scores for all Programs

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	7156657.015	68	105244.956	16.563	.000
Within Groups	13057797.065	2055	6354.159		
Total	20214454.080	2123			

Estimating the one-way ANOVA model is useful as a preliminary step in a hierarchical data analysis. It produces a point estimate and confidence interval for the grand mean. It also provides information about the outcome variability at each of the two levels (Raudenbush and Bryk, 2002). The variance parameter represents the within-group variability and the tau-00 (τ_{00} is the population variance among the program means) captures the between-group variability (see tables 5 and 6).

Table 7 presents the results from the random-coefficient model (Covariance Parameter Estimates).

Table 7
Covariance Parameter Estimates (SAS)
HLM Analysis

Subset	Estimate	Standard Error	Z Value
Reading Skills	8957.19	1227.94	7.29**
Mathematics Skills	3512.74	671.34	5.23**

** Pr Z <.0001

Random-coefficients regression model allows all level-1 coefficients to vary randomly. That is, both the level-1 intercept and one or more level-1 slopes vary randomly, but no attempt is made to predict this variation (Raudenbush and Bryk, 2002). The results for the programs differ randomly given reading and mathematics skills scores. The results are similar to those previously reported for the one-way ANOVA model. Programs differ randomly given reading and mathematics skills scores. The Random Coefficient for reading skills scores, $\tau_{00} = 8957.19$, $Z = 7.29$, $p < .0001$; and mathematics skills scores, $\tau_{00} = 3512.74$, $Z = 5.23$, $p < .0001$ were significant, therefore, we conclude that programs are different.

Comparison of Community ABE and Family Literacy Programs

Hypothesis 2

2a). Type of program does not explain the variance; programs vary randomly given reading scores.

2b). Type of program does not explain the variance; programs vary randomly given mathematics scores.

To answer these research questions an HLM “Intraclass Correlation Coefficient” a Covariance Parameter Estimates, using SAS and SPSS Test of Between-Subject Effects (ANOVA table), were computed (see appendix C). The intraclass correlation coefficient measures the proportion of variance in the outcome that is between groups (thus: the level-2 units). It is estimated by substituting the variance components for their respective parameters.

The intraclass correlation coefficient (see table 7) for Reading Skills is $(8957.19)/(8957.19 + 8364.35) = .517$. This means that approximately 52 percent of the variance in students’ reading scores was attributed to the programs in which they were enrolled. The intraclass correlation coefficient for Mathematics Skills was $(3512.74)/(3512.74 + 6352.19) = 3512.74/9864.93 = .3561$. This means that approximately 36 percent of the variance in students’ mathematics scores was attributed to the programs in which they were enrolled. The question then becomes, does type of program (0 = Community ABE/GED; 1 = Family Literacy) explain the difference?

A further analysis of means and standard deviation for mathematics and reading scores as a function of Community ABE/GED and family literacy programs revealed that programs differ, again at the student-level, based on average mathematics and reading scores (see table 8). Therefore, type of program does influence students' reading and mathematics scores. The HLM and SPSS analyses indicated that adults who were enrolled in the family literacy programs in Pennsylvania for the 2002/2003 PY performed better in both reading and mathematics skills scores than those students enrolled in the Community ABE/GED program for the same period.

Table 8

Means, Standard Deviation, and n for Mathematics and Reading Scores as a Function of Community ABE/GED and Family Literacy Programs

	Community ABE/GED			Family Literacy			Total	
Subtest	n	M	SD	n	M	SD	M	SD
Mathematics Skills	1571	487.97	100.52	553	498.33	88.33	490.67	97.58
Reading Skills	3793	448.26	138.43	731	489.05	106.50	454.85	134.62
Total	5364	936.23	238.95	1,284	987.38	194.83	945.52	232.20

To triangulate the hierarchical linear modeling (HLM) results above, hypothesis 3(a) (b) analyzed the data when all the predictors and the response variables, including the subtest (reading skills, mathematics skills, and listening skills) with total sample of 7397 were considered using ANOVA and correlation statistics.

Hypothesis 3

3a) Family Literacy programs with high bonding and bridging social capital do not have higher learner achievement scores than Community ABE/GED programs

3b) The length of time participating in the family literacy programs with high bonding and bridging social capital does not influence adult literacy achievement scores.

The emphasis for hypothesis 3(a) (b) was learning achievement at the student-level; an Independent Sample *t* Test statistics was used. An Independent Sample *t* Test is employed when investigating the difference between two unrelated or independent groups (in this case, Community ABE and Family Literacy Programs). The analysis provided two statistical tests. The *F* test was not significant for listening skills (.84); this means that the assumption was not violated, and the “Equal variance assumed” line was used for the *t* test and related statistics (see Appendix C). However, the Levene’s *F* was statistically significant at alpha .05 level for reading skills and total mathematics; thus, the variances were significantly different and the assumption of equal variances was violated. Therefore, the “Equal variance not assumed” line was used. The *t* in scores on listening skills was not statistically significant ($p = .075$). However the results for reading and math scores were statistically significant (reading, $t = -9.38$, degree of freedom (*df*) = 1262.39, and $p = .001$; scores on math, $t = -2.38$, $df = 1099.85$, and $p = .017$). We therefore concluded that, there were differences between Community ABE programs and Family Literacy programs.

Table 9
Comparison of Community ABE and Family Literacy Programs on
Reading Skills, Total Mathematics, and Listening Skills
For TABE, CASAS, & GED

Variable	N	M	SD	<i>t</i>	df	<i>p</i>
Reading Skills				-9.380	1262.393	.000
Community ABE	3937	447.219	138.585			
Family Literacy	739	489.274	106.072			
Total Mathematics				-2.383	1099.850	.017
Community ABE	1683	487.282	100.740			
Family Literacy	569	497.910	88.774			
Listening Skills				-1.783	467	.075
Community ABE	449	215.118	8.680			
Family Literacy	20	218.650	8.364			

Table 9 (above) shows that Family Literacy programs are significantly different from Community ABE programs on reading skills ($p = .001$) and total mathematics ($p = .017$). Inspections of the two group means indicated that the average reading skills score for Community ABE programs (447.22) was significantly lower than the score (489.27) for Family Literacy programs. A similar trend existed for total mathematics. The mean score for

Community ABE programs (487.28) was lower than the score (497.91) for Family Literacy programs. However, Community ABE programs did not differ significantly from Family Literacy programs on Listening Skills ($p = .075$).

Since the assumption of equal variances was violated, we ran the appropriate nonparametric statistic, which in this case was the Mann-Whitney (M-W) U test. The M-W is used with a between group design with two levels of an independent variable. The Mann-Whitney test (Table 10) is a nonparametric test to compare two unpaired groups. This test is an alternative to the independent group t-test, when the assumption of normality or equality of variance is not met.

Table 10

Non Parametric Test: Mann Whitney U

Ranks on TABE, CASAS, & GED

	Program	N	Mean Rank	Sum of Ranks
scores on reading	Community ABE	3937	2287.31	9005140.00
	Family Literacy	739	2611.21	1929686.00
	Total	4676		
scores on math	Community ABE	1683	1116.01	1878237.50
	Family Literacy	569	1157.54	658640.50
	Total	2252		
scores on listening	Community ABE	449	232.64	104453.50
	Family Literacy	20	288.08	5761.50
	Total	469		

The above table shows the mean or average ranks for Community ABE and Family Literacy programs on each of the three dependent variables. SPSS ranked the students from 4,676 (highest) to 1 (lowest) for “reading skills,” 2,252 (highest) to 1 (lowest) for “total mathematics,” and 469 (highest) to 1 (lowest) for “listening skills,” so that, in contrast to the

typical ranking procedure, a high mean rank indicated the group scored higher. On all three subtests (reading skills, total mathematics, and listening skills) Family Literacy students ranked higher than Community ABE/GED students. Table 11 confirms the results of the Mann-Whitney (M-W) U test and the previous HLM analysis.

Table 11
Comparative Mean and Standard Deviations of
Community ABE and Family Literacy Programs Variables

	Community ABE			Family Literacy		
	N	Mean	s.d	N	Mean	s.d
Test Scores	6069	441.16	140.25	1328	488.90	103.76
Instruction Hours	6069	144.45	86.89	1328	154.47	83.95
Reading Scores	3937	447.22	138.58	739	489.27	106.07
Math Scores	1683	487.28	100.74	569	497.91	88.77
Listening Scores	449	215.12	8.68	20	218.65	8.36

As evident in Table 11 and above analyses, there were enough statistical differences in the comparative mean and standard deviations scores between the two groups. Consequently, this led us to reject the null hypothesis in favor of the alternative that students who participate in the Family Literacy programs with high bonding and bridging social capital do have higher achievement scores than Community ABE/GED programs.

Hypothesis 4

4a) For the Community ABE/GED programs, mean hours of instruction and meanSES do not predict students' reading and mathematics scores.

4b) For the Family Literacy programs, mean hours of instruction and meanSES do not predict students' reading and mathematics scores.

To answer these research questions, HLM Test of Fixed Effects (see tables 12 and 13) was used to model at program level (level-2). However none of the variables were significant predictors at the program level.

Table 12

Type 3 Tests of Fixed Effects: Reading Skills

Effect	Num DF	Den DF	F Value	Pr > F
type	1	119	1.07	0.3023
ses	1	4401	0.92	0.3365
hours	1	4401	0.11	0.7455

Table 13

Type 3 Tests of Fixed Effects: Mathematics Skills

Effect	Num DF	Den DF	F Value	Pr > F
type	1	65	0.06	0.8007
ses	1	65	0.05	0.8210
hours	1	2055	0.02	0.8831

The question then becomes, why would type of program not influence scores at the program level but did influence scores at the student level? At the student level, we were looking at more than 4,000 students in the program. The fact that while there was significant mean differences at the student level, the sample size contributed greatly to this (see appendix C). The partial eta-squared values for both reading and math skills were very low. Essentially, there were minimal differences in type of program when the data was analyzed at program level.

As depicted in tables 12 and 13, none of the effects (program type, SES, and instructional hours) were significant at the program level. Based on these results, we examined differences due to type of program (community ABE/GED versus family literacy), SES, and hours of instruction at the student-level for both the reading and mathematics scores.

Student-Level Analysis

Table 14 presents the analysis on differences of program effects on student-level using ANOVA and correlation statistics. At the student-level, the analysis indicated that students'

scores differ significantly due to type of program. The descriptive statistics indicated that students in the family literacy program scored higher on all tests than their counterparts in the Community ABE/GED program.

Table 14

Descriptive Statistics

Dependent Variable: students test score

Type of program:	Mean	Std. Deviation	N
CmABE/GED	447.2191	138.58454	3937
Family Literacy	489.2740	106.07188	739
Total	453.8655	134.83791	4676

Tests of Between-Subjects Effects

Dependent Variable: students test score

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power(a)
Corrected Model	1100447.83(b)	1	1100447.83	61.31	.000	.013	61.307	1.000
Intercept	545688132.87	1	545688132.87	30400.94	.000	.867	30400.9	1.000
type_of_program_CmABE_0_FL_1	1100447.83	1	1100447.83	61.31	.000	.013	61.307	1.000
Error	83896957.56	4674	17949.71					
Total	1048224774.0	4676						
Corrected Total	84997405.39	4675						

a Computed using alpha = .05

b R Squared = .013 (Adjusted R Squared = .013)

The nonparametric correlation coefficients which are Spearman Rank correlation coefficients (see appendix C), showed a similar pattern of relationship between the two programs as reported above (Community ABE/GED programs differ from the family literacy programs). Table 15 shows the correlation analysis.

Table 15
Correlations for Student-Level Variables (N = 4676)

Variable	Students Test score	Student Instruction Hours	Student SES
Students Test Score	--	-.06**	-.03
Students Instruction Hours	--	--	.13**
Student SES	--	--	--

** $p < .001$

Student test scores negatively correlated with student instruction hours and student instruction hours correlated positively with student SES. Particularly noteworthy is that both correlation coefficients could not be considered a large effect size. Particularly noteworthy is that the correlation coefficients were negative and of larger size for the Community ABE/GED programs than for the family literacy programs when hours of instruction and SES were considered.

Comparative and International Education Section

Local (Pennsylvania) to National (U.S.) Comparisons

Hypothesis 5

The Pennsylvania adult basic and literacy programs differ significantly from the national adult basic and literacy education programs.

This section compares the Pennsylvania ABE program results and the entire U.S. report for the 2002/2003 program year. The rationale for doing this analysis was to search for similar patterns as reported by this research study and to compare the results to the U.S. Department of Education Office of Vocational and Adult Education report on State Performance to Congress. Adult Education and Family Literacy Act (AEFLA), enacted as Title II of the Workforce Investment Act (WIA) of 1998, is the umbrella body for the adult basic and literacy education programs. In the program year (PY) 2002/2003, the program enrolled 2,736,192 adult learners, of which just fewer than 40 percent were enrolled in Adult Basic Education, 18 percent were enrolled in Adult Secondary Education, and 43 percent were enrolled in English Literacy programs. Table 16 provides a summary comparison of actual performance on each of the core measure for the adult education programs for 2001/2002 and 2002/2003 program years. The table shows a modest increase in educational gain, high school completion, post-secondary transition, and job retention. However, the data revealed a significant loss for the employment measure, entering and retaining employment (5 percentage point) for the AEFLA programs.

Table 16

Actual Performance on Core MeasuresNational Totals 2001/2002 and 2002/2003Community ABE & Family Literacy Programs

Performance Measure			Percent	Total Outcome
	2001/2002	2002/2003	Change	2002/2003 PY
Educational Gain (ABE/ASE)*	37%	38%	+1%	1,701,148
Educational Gain (English Lit)*	34%	36%	+2%	1,172,317
High School Completion	42%	44%	+2%	544,619
Entered Post Sec. Ed/Training	29%	30%	+1%	142,899
Entered Employment	42%	37%	-5%	421,571
Job Retention	63%	69%	+6%	586,951

* Percentage of adults enrolled who completed one or more educational levels

Source: U.S. Department of Education Office of Vocational and Adult Education (2004)

Table 17 shows the Pennsylvania ABE frequency distribution of adult learners enrolled in both the Community ABE and family literacy programs by program area and Table 18 shows the comparative distribution of learners enrollment by program area.

Table 17

Frequency Distribution for Enrollment by Program Area
Pennsylvania Community ABE & Family Literacy Programs

Levels	<i>f</i>	Percentage
Beginning ABE	946	12.8
Beginning ESL	84	1.1
Beginning Literacy ABE	320	4.3
Beginning Literacy ESL	2	.0
High Adult Secondary Ed	400	5.4
High Advanced ESL	64	.9
High Intermediate ABE	1858	25.1
High Intermediate ESL	398	5.4
Low Adult Secondary Ed	821	11.1
Low Advanced ESL	343	4.6
Low Intermediate ABE	1846	25.0
Low Intermediate ESL	313	4.2

Table 18

Comparative Distribution for Enrollment by Program Area

Community ABE & Family Literacy Programs

Program Area	Enrollment	
	PA (Local)	U.S. (National)
Adult Basic Education	67%	39%
Adult Secondary Education	17%	18%
English Literacy	16%	43%

Tables 17 and 18 showed that 67 percent of students enrolled in adult basic education programs in Pennsylvania while only 39 percent enrolled nationwide. Similar number of students (17 percent and 18 percent) enrolled in adult secondary education for PA and U.S. respectively. On the other hand, 43 percent of students enrolled nationwide while only 16 percent enrolled in English literacy in Pennsylvania. The differences between the local and national totals were accounted for by the enrollment statuses of Hispanic or Latino ethnic groups (see Table 19). On national level, the enrollment figure for the Hispanic group was more than the enrollment reported locally. On achievement outcomes, the Pennsylvania programs did not differ significantly as compared to national standards. The average test scores for the Pennsylvania Community ABE and family literacy programs were: CASAS 216; GED 439; and the TABE 533. These test scores were within the acceptable performance range set by the National Reporting System.

Table 19
Comparative Analysis
Enrollment by Ethnicity

Ethnicity	Enrollment	
	PA (Local)*	U.S. (National)
White	3127 (42.3)	787,835 (28.8)
Black	2723 (36.8)	540,227 (19.8)
Hispanic	1080 (14.6)	1,142,912 (41.8)
Asian	458 (6.2)	203,732 (7.4)
Other**	9 (.1)	59,480 (2.2)
Total	7397 (100)	2,734,186 (100)

*Sampled data

**Other = Native American, Pacific Islander

National (U.S.) to International (UK) Comparisons

Hypothesis 6

There are no similarities between the family literacy programs in Pennsylvania (U.S.) and the family learning programs in Lancashire (UK).

The secondary focus of this research study was to assess the impact of adult participation in family literacy across two countries. This section sought to compare the results of Family Literacy programs from Pennsylvania (U.S.) to family learning programs in Lancashire (UK). The following is a summary of the demographic and economic history of family learning within the County of Lancashire. It is one of the English shire counties, covering 12 district authorities within its boundaries. The County's total population is 1,140,673, and is a mix of urban and rural areas with population concentrated largely in towns ranging in size from Preston (128,000) to Clitheroe (14,000). Minority ethnic communities account for only seven percent of the population. Family learning in Lancashire is managed by Adult and Continuing Education Service. The data for analysis (2002/2003 PY) was a survey report taken from the National Institute of Adult and Continuing Education report by Horne and Haggart (NIACE, 2004).

As was the case for the PA Family Literacy programs, the majority of adults who responded to the Lancashire survey were mothers. About three percent were fathers; four percent were grandparents, and a further six percent were aunts. Majority of the learners sampled were White, with Asian adults accounting for six percent (this was in line with the general population average for Lancashire of seven percent). In the PA program, 42 percent were White, 37 percent

were Black, 15 percent were Hispanic, and six percent were Asian. Tables 20 & 21 show the prior education levels of the PA program and the Lancashire family learning program.

Table 20
Prior Education - Family Literacy
Pennsylvania, U.S.

	Percentage
Kindergarten to 8 th Grade	29.4%
Grade Level 9	16.4%
Grade Level 10	14.2%
Grade Level 11	8.7%
Did Not Complete Grade 12	12.3%
High School Diploma	1.9%
GED/Post High School	17.1%

Table 21
Prior Education - Family Learning
Lancashire, UK

	Percentage
No Qualification	26.8%
Entry Level	2.1%
Level 1	11.3%
Level 2	35.1%
Level 3 & Above	21.7%
No Response	3.1%

Nearly 30 percent of adult learners in the Pennsylvania family literacy program had K-8 prior education, 16 percent had grade 9 education, 14 percent had grade 10 education, while 12 percent did not complete high school. Only 19 percent enrolled in the program had high school and beyond prior education. As compared to the Lancashire family learning program, there were major differences in the prior qualification levels of those learners who were sampled. Over a quarter of learners in the sample had no qualification (that is, they did not graduate from high school or pass the General Certificate of Secondary Examination (GCSE), a GED equivalent). About 35 percent had a level 2 qualification (equivalent to a grade A-C pass at GCSE).

Social Capital Indicators

Differences existed between the Pennsylvania program and the Lancashire program; however, both programs made similar progress towards social capital acquisition. The following were the descriptions of social capital indicators for the Lancashire family learning program. On working statuses of learners, about 67 percent were at home looking after children/caring for others, 35 percent had part time jobs, and three percent had full time jobs before participating in the family learning program. About 95 percent learned about how children learn; 68 percent spent time with child(ren); 88 percent helped their children; 69 percent learned for themselves (learning for me); 44 percent gained more confidence in talking to teachers; and 31 percent enrolled with the aim of acquiring a certificate or diploma. Learners that socialized with other adults and making friends were 70 percent and about 53 percent of adult learners were able to get out of the house.

On adult outcomes on confidence, 43 percent of learners felt more confident as parents, 37 percent felt more confident in talking to teachers, and about 56 percent of participants felt more confident in doing more learning. Twelve percent felt more confident in dealing with paperwork, bills, and letters, while 36 percent felt more confident in general as a person in own right. Eighty-three percent of adult learners played with their children more often than before as a result of taking part in the family learning program. About 45 percent of learners read with children more and similar number talked to children more. Forty-three percent of learners helped their children with their homework more. About 16 percent were more involved in school and 20 percent were involved in community and other activities. Fifty-three percent had more friends,

28 percent got out more, 19 percent went to the library more, 18 percent used computers and/or the internet more, and 25 percent read more books, newspapers and/or magazines more.

Tables 22 and 23 summarize the social capital indicators of the Pennsylvania family literacy programs.

Table 22

Public Assistance and Labor Force Status

Social Capital Indicators

PA Family Literacy

	<i>f</i>	Percentage
Public Assistance:		
Not on Public Assistance	928	39.9
On TANF Assistance	637	27.4
On Other Assistance	758	32.6
Labor Force Status:		
Employed Full Time	242	10.4
Employed Part Time	256	11.0
Unavailable for Work	341	14.7
Unemployed	1484	63.9

Table 23

Household Status and Entry IncomeSocial Capital IndicatorsPA Family Literacy

	<i>f</i>	Percentage
Household Status		
Head of Single Parent Household	752	32.4
Head of Spouse/Partner in 2 Parent Household	1294	55.7
Head of Spouse/Partner-no dependents	17	.7
Dependent member of Household	54	2.3
Dependent and Single Parent	86	3.7
Living in Group Quarters	97	4.2
Living Alone	10	.4
Entry Income:		
Do Not Know	544	23.4
Less Than \$3,000	369	15.9
\$3,001 - \$5,999	327	14.1
\$6,000 - \$8,999	192	8.3
\$9,000 - \$11,999	168	7.2
\$12,000 - \$14,999	177	7.6
\$15,000 - \$19,999	197	8.5
\$20,000 - \$25,000	189	8.1
Over \$25,000	159	6.8

According to the above tables, about 60 percent of Pennsylvania family literacy participants received some form of public assistance. Sixty-four percent of learners were unemployed, and about 15 percent were not available for work. Fifty-six percent were head of spouse/partner in two-parent household, while 32 percent were head of single parent household. Entry income statuses varied widely with 23 percent reporting that they did not know how much they made in a year; about 16 percent reported making an average of about \$3,000 or less per year. Only seven percent of learners reported making over \$25,000 a year. Adults from the Pennsylvania family literacy program reported that they spoke to teachers on average twice more than they did previously, and read on average four books with children.

CHAPTER FIVE

SUMMARY, DISCUSSION, AND CONCLUSION

In this final chapter, an overview of the significant findings of the study is provided as well as a consideration of the findings in light of previous research studies. A careful examination of the implications of the study for theory and practice are reported. And finally, the limitations of the study that may affect the validity or the generalizability of the results and recommendations for future research are indicated.

Overview of the Study Findings

The third national Even Start evaluation (St. Pierre et al., 2003) reported that given Even Start's intuitive appeal as an approach for enhancing parent and child literacy, the program wasn't more effective than the mix of services that control group families sought for themselves. However, there was no specific empirical study that compared the effectiveness of the adult basic education component of the Even Start family literacy program with the Community ABE/GED program. This study investigated the relationship between adult learner participation and outcome, and a comparison study between Community ABE/GED programs and Even Start family literacy adult basic education programs in Pennsylvania. This study further compared the results from the Even Start family literacy programs to a similar program (family learning) in Lancashire, UK.

This study analyzed the effects of human capital investment in conjunction with social capital development. Whereas physical capital refers to physical objects and human capital refers to the properties of individuals, social capital refers to connections among individuals and their social networks. The intent of this study was to provide empirical evidence that outcomes from standardized achievement tests (like the TABE, CASAS, and GED) reflect the impacts of social capital acquired through participating in family literacy programs. Family literacy programs emphasize active learning through social interaction, which promotes bonding and bridging social capital and that participating in the Even Start family literacy programs enhance learners' achievement scores. Even Start programs promote bonding and bridging through the common emphasis on the literacy development of children and their parents through: early childhood education; parenting education; adult basic education; and parent-child interactive literacy activities. The program's focus is that participating families need each of the above four core instructional components, and that these services will be more effective when integrated in a unified program.

The sample for this study was taken from the Pennsylvania Bureau of Adult Basic Education (ABLE). The sample consisted of 7,397 adult basic education students from both the Community ABE/GED and family literacy programs. More than half of the student population from the sample were female and ethnic background of students were majority Caucasian, followed by African Americans, Hispanics, Asians, Native Americans, and Pacific islanders. Overall, students' performance according to this study was within the acceptable norm of the National Reporting System benchmarks. This study used hierarchical linear modeling (HLM) to investigate how adult basic education program characteristics, such as community and socio-

economic factors, influenced the learning outcome of ABE programs and to accurately model student performance within programs (Bryk and Raudenbush, 1992; Goldstein, 1995).

The dataset was edited to eliminate programs that had fewer than five (5) students. Reading scores and mathematics scores became the two main measures and they were analyzed independently in two HLM analyses. For the reading scores, the student sample size was 4525, the program sample size was 121, and at least 5 students were enrolled in each program. The smallest program had 5 students while the largest program had 600 students. For the mathematics scores, the student sample size was 2124, the program sample size was 68, and at least 5 students were enrolled in each program. The analysis indicated that programs differed randomly given reading and mathematics skills scores. The Random Coefficient for reading skills scores and mathematics skills scores were all significant. All these analyses were significant at the student-levels: however, when the data was modeled at the program level (level-2) none of the variables (program type, MEANSES, Av instruction hours) were significant. These results led us to conclude that programs vary randomly. We also employed the intraclass correlation coefficient. The intraclass correlation coefficient measures the proportion of variance in the outcome that is between groups (thus: the level-2 units). It is estimated by substituting the variance components for their respective parameters. The intraclass correlation coefficient for Reading Skills was 52 percent. This means that approximately 52 percent of the variance in students' reading scores was attributed to the programs in which they were enrolled. The intraclass correlation coefficient for Mathematics Skills was 36 percent. This means that approximately 36 percent of the variance in students' mathematics scores was attributed to the programs in which they were enrolled.

This study compared the Pennsylvania ABE program results and the entire U.S. report for the 2002/2003 program year. The rationale was to search for similar patterns as reported by this research study and to compare the results to the U.S. Department of Education Office of Vocational and Adult Education report on State Performance to Congress. The results indicated the trend was similar percentage wise. However, there were dissimilarities as far as number of students' enrollment was concerned. In the Pennsylvania program, 16 percent of students enrolled while only 39 percent enrolled nationwide. The differences between the local and national totals were accounted for by the enrollment statuses of Hispanic or Latino ethnic groups. On national level, the enrollment figure for the Hispanic group was more than the enrollment reported locally. On achievement outcomes, the Pennsylvania programs did not differ significantly as compared to national standards. The average test scores for the Pennsylvania Community ABE and family literacy programs were: CASAS 216; GED 439; and the TABE 533. These test scores were within the acceptable performance range set by the National Reporting System.

The secondary focus of this research study was to assess the impact of adult participation in family literacy across two countries. This study compared the results from the Pennsylvania (U.S.) Family Literacy programs to family learning programs in Lancashire (UK). Differences existed between the Pennsylvania program and the Lancashire program; however, both programs made similar progress towards social capital acquisition. The following were the descriptions of social capital indicators for both the U. S. and the UK programs. On working statuses of learners for the Lancashire family learning program, about 67 percent were at home looking after children/caring for others, 35 percent had part time jobs, and three percent had full time jobs before participating in the family learning program. On adult outcomes on confidence, 43

percent of learners felt more confident as parents, 37 percent felt more confident in talking to teachers, and about 56 percent of participants felt more confident in doing more learning. Twelve percent felt more confident in dealing with paperwork, bills, and letters, while 36 percent felt more confident in general as a person in own right. Eighty-three percent of adult learners played with their children more often than before as a result of taking part in the family learning program.

The Pennsylvania program reported similar outcomes. About 60 percent of Pennsylvania family literacy participants received some form of public assistance. Sixty-four percent of learners were unemployed, and about 15 percent were not available for work. Fifty-six percent were head of spouse/partner in two-parent household, while 32 percent were head of single parent household. Entry income statuses varied widely with 23 percent reporting that they did not know how much they made in a year; about 16 percent reported making an average of about \$3,000 or less per year. Only seven percent of learners reported making over \$25,000 a year. Adults from the Pennsylvania family literacy program reported that they spoke to teachers on average twice more than they did previously, and read on average four books with children.

Finally, the correlation analyses for this study indicated that there was a negative association between hours of instruction and test scores in the adult basic and literacy education programs and that the strength of the association was significant. Further hypotheses tested in this study also affirmed the major research question and the theoretical frame that family literacy programs with high bonding and bridging social capital also have higher student achievement test scores than Community ABE/GED programs. Finally, the study indicated that though differences existed between the U.S. and the UK programs, both programs made similar progress towards social capital acquisition.

Discussion

Intensity and Duration of Instruction

PA ABLE data for the 2002/2003 program year were used to analyze the effect of intensity and duration of adult basic and literacy education programs. It should be noted that this study included students with hours of instruction between 80 and 1128. The criteria for inclusion in the study sample were: students who have no missing demographic data records; no incomplete information about enrollment and test scores; and students who accumulated at least 80 hours of class sessions. The range of average attendance hours among the programs was 80 hours to 1128 hours. This high variation is common with student attendance in adult basic and literacy programs, as in any program some students may stop attending after one or two sessions, while others may choose to stay for relatively long time. There is the general assumption that greater attendance will result in more learning (Young et al., 1994a; St. Pierre, et al., 2003). Mikulecky, Lloyd, Horwitz, Masker, and Siemantel, (1996) on their evaluation of workplace literacy programs study reported that learners who accumulated 200 hours of instruction made significant gains while learners with 50 or less hours of literacy instruction did not make significant gains. St. Pierre et al. (1999) also reported that there was a significant relationship between the amount of adult literacy education instruction and gains on the CASAS. However, Young et al. (1994) cautioned that learners' initial ability was a potential predictor of learning gain, and that total hours of instruction were not shown to be related to tested learning outcomes for either Adult Basic Education (ABE) or Adult Secondary Education (ASE).

This study found that although there was a significant association between instructional hours and test scores, the association was negative. Thus, the increased instructional hours did not result in better adult literacy skills as measured by the TABE, CASAS, and GED subtests: the result indicated that gains were more predictable when instruction was intense. For instance, among the GED preparatory students who scored the highest attended for fewer than 80 hours of adult literacy instruction. Perhaps the increased number of hours of participating in the adult basic and literacy programs was not the only factor affecting learning change. Other factors might have included intensity and instructional setting (social capital embedded instruction). Similar trend were reported by Kassab et al., (2004), Askov et al., (2005), Snoddy, (1990), and Johnston, Young, and Petty, (2001).

Kassab et al., (2004) reported that among continuing family literacy ABE participants, students who participated in at least 75 hours but no more than 99 hours in adult education instruction had higher TABE mathematics posttest scores than students with fewer or more adult education hours. They concluded that intensity of instruction was an important factor when examining adult literacy skills assessment scores. Askov et al., (2005) also reported that for women who were continuing their participation in the family literacy program, posttest scores were negatively related to duration in the program. Their research indicated that among continuing participants, women who were in the program for fewer number of days tended to have better TABE mathematics posttest scores than those in the program for greater number of days. In Snoddy's (1990) research, the study evaluated Macomb Reading Partners (MRP), a one-to-one volunteer tutoring program of the Macomb Literacy Project. The primary objective of the study was to examine the reported motivations of adults with low levels of literacy who seek entry into a literacy program. The findings was that average monthly gain was significantly

higher for those tutored for 10 months or less than for those tutored 13 months or more.

Therefore, the results reported in our study appear to support the findings of these other studies cited above.

Multilevel Analyses

Multilevel analyses for this study indicated that programs differed randomly given reading and mathematics skills scores. The Random Coefficient for reading skills scores and mathematics skills scores were all significant at the student-level. These results made us to conclude that programs vary randomly. We also employed the intraclass correlation coefficient (a measure of the proportion of variance in the outcome that is between groups). The intraclass correlation coefficient for Reading and Mathematics Skills were 52 percent and 36 percent respectively. That is approximately 52 percent of the variance in students' reading scores was attributed to the programs in which they were enrolled; and approximately 36 percent of the variance in students' mathematics scores was attributed to the programs in which they were enrolled. These significant statistical correlations led us to infer that programs were different.

The next question this study explored was: Does type of program (Community ABE/GED versus Family Literacy) explain the difference? A further analysis of means and standard deviation for mathematics and reading scores as a function of Community ABE/GED and family literacy programs revealed that programs differed again based on mathematics and reading scores. Therefore, type of program did influence students' reading and mathematics scores. The HLM and SPSS analyses indicated that adult students who were enrolled in the family literacy programs in Pennsylvania for the 2002/2003 PY performed better in both reading

and mathematics skills scores than those students enrolled in the Community ABE/GED program for the same period. However, when the analysis was done on program level, none of the variables were significant predictors. This prompted the study to model the analysis on level-1 for students for both reading and mathematics skills scores.

Why would type of program not influence scores at the program level but did influence scores at the student level? The assumption was that, at the student level, we were looking at more than 4,000 students in the program. The precision of estimation of the program mean depended on the sample size within each program. The fact that while although there were significant mean differences at the student level, the sample size contributed greatly to the results at the program level. The effect size (partial eta-squared values) for both reading and math skills were very low; in truth, the programs were contributing to very similar results as this was a small effect. The results indicated that the intercepts (program mean) depended on sample size within each program. When the data were analyzed, it was evident that some programs had fewer than five students while others had more than one hundred. We, therefore, included in our study only programs that had a minimum of five students. To analyze at the program-level with these wide variability of class size (5 students for some programs and over 600 students for other programs) rendered our study results at the program-level not significant. Future researchers may explore the issue of class-size and its effect on program-to-program comparison.

Socio-Economic (SES) Factors

The following socio-economic factors influenced participation: labor force status, public assistance, household status, entry income, gender, ethnicity, and residential factors. Socio-

economic status was defined in this study to be a composite measure of social class of low/high income level plus area of student residence (rural/urban). On the basis of the findings from this study, it appeared that students who were employed full-time or part-time were less likely than those who were unemployed to participate longer in the ABE programs. Students on public assistance were likely to participate longer in adult basic and literacy programs. Students who were earning less than \$6,000 on entry into the program did participate longer than those receiving over \$25,000 a year. Students who were head of spouse/partner in two-parent household participated longer than those students who were head of single household. Females were more likely than males to participate longer and students from larger communities also participated more than those from smaller communities. These findings are consistent with the reports from the research of Kassab et al. (2004).

According to Kassab et al, women who were single heads of households were less likely than dual-headed households to participate intensely. Their research also revealed that employed students had fewer hours of instruction than unemployed students, and students from larger communities on entry into the program were more likely to participate in adult basic education, parenting education, or interactive literacy in terms of both duration and intensity. Findings from this study indicate that single parents that would arguably benefit most from adult education remain the least likely to try it and that gender gaps may be starting to open up, as the proportion of women learning grows while male participation declines.

Influence of Social Capital on Learner Achievement

To investigate the null hypothesis that family literacy programs with high bonding and bridging social capital do not have higher learner achievement test scores than Community ABE/GED programs, this study conducted an “Independent Sample t Test,” “Non Parametric Mann Whitney U test,” and a “Comparative Mean and Standard Deviation” statistics. The independent sample t test indicated that family literacy programs were significantly different from Community ABE/GED programs on reading skills and total mathematics. The Mann Whitney U test furthermore, ranked the family literacy program higher on reading skills, total mathematics, and listening skills than the Community ABE programs. Finally, the comparative mean and standard deviation analysis provided enough evidence to state that on reading and mathematics subtests (listening was not significant), students in the family literacy program ranked high on mean test scores on TABE, CASAS, and GED. The statistical analyses led this study to accept the alternative hypothesis that family literacy programs with high bonding and bridging social capital also have higher student achievement scores than Community ABE/GED programs. The results from this study are consistent with Dika and Singh (2002) and Stanton-Salazar and Dornbusch (1995) studies.

According to Dika and Singh, educational attainment and grades were positively associated with strong help network of parents, number of friends known by parents, and parents’ involvement in school. Stanton-Salazar and Dornbusch studied institutional-based social capital as an outcome of grades. They concluded that grades were positively related to three different informational network variables: number of school-based weak ties, number of non-kin weak ties, and proportion of non-Mexican origin members. Granovetter (1973) concluded that

weak ties to other social circles provide access to social capital for instrumental action.

Coleman's (1988) notion of social capital as a vehicle for analyzing the influence of social context on educational attainment focused on how interaction within and between families generates transferable values.

The vital ingredients that define effective family literacy programs are integrated family-focused services for both generations with sufficient intensity and duration of instruction to effect significant changes. As was evident in this study, families who enrolled into family literacy programs came from predominantly urban communities, representing varieties of cultures and in many instances received, or had in the past, some sort of public support. All these families had enough educational and non-educational problems that stood in their way of obtaining economic stability. The key element in the family literacy programs was that it brought together these parents and their children in an educational environment to facilitate and nurture the learning relationship between them.

Social Capital Acquisition

As was true with both the Pennsylvania (U.S.) and the Lancashire (UK) programs, the study revealed that the majority of learners in both programs were mothers, Caucasians, and students from larger communities. Majority of students from both programs had K-9 entry level education. There were other intergenerational spill-over effects as a result of learner participation in the Lancashire family learning programs. Children of participants did better at school; their behavior improved, and talked more as a family, did more activities as a family, had better family relationship and the family as a whole was more interested in learning. Similar impacts

were felt by the Pennsylvania family literacy program. Adult learners spoke to teachers on average twice more than they did previously, and read on average four books with children. Finally, the results for outcomes related to social capital acquisition were higher for students who had participated in the family literacy programs than for students who did participate in the Community stand-alone program.

Bryk, Lee, and Holland (2002) found that students who attended Catholic schools in Chicago outperformed their counterparts who attended public schools; they attributed this finding to the level of social structures surrounding the Catholic schools. Similar attributions could be said about students who participated in the family literacy programs for the study period. The family literacy programs address the goal of reducing family problems by assisting participants to access services available in the community. The results indicate that the frequency with which adults access these services (e.g., housing, health, and social services) increases as they continue to participate in the program. Another key to the success of reducing family problems is the collaboration of family and child education programs with other community agencies and programs, including social services, health services, and adult and early childhood educational programs (Semali, n.d.). However, there is very little knowledge about the way people's networks affect their access to learning. Looking at the results of this study, one could make the assertion that some social arrangements inherent in the family literacy programs promote different types of learning and that students who participate longer in family literacy programs stood a better chance of outperforming their counterparts in the Community ABE/GED programs.

In the UK program, about half of the students who enrolled in the family learning courses over twelve months during the study period indicated that they talked to teachers more; they had

greater understanding and appreciated the role of teachers and that they found them more approachable; greater love of involvement in their child's school; volunteering in their child's school; or paid classroom assistants and in some few cases school governors (similar to a school board). These were possible as a result of their participation in the family learning programs.

Schuller et al. (2002) noted that family learning programs involve more than creating parents awareness and involvement in their children's education (though important): many different sets of relationships are potentially affected within and across generations. In every case, learning within the family literacy context can play a significant role in sustaining and strengthening these relationships, notably by improving communication skills and mutual respect. Through participating in family literacy programs some families increased the number of activities they shared and enjoyed together (Koomson, 2005). This can lead to families spending more time together to experience a wider range of activities, such as reading together, visiting the library, and visiting new places of interest. As a result of participating in family literacy programs, some families have been able to access services through increased awareness and knowledge of what service is available (Sure Start, 2001 & 2002). Eldred and Haggart (2002) also noted that family literacy programs can be seen as active learning programs which benefit the community by building social relationships and friendships between generations and local communities.

Focus groups in eight Sure Start (UK) projects in 2001 found that parents who took part in Sure Start activities experienced an increased level of community spirit with parents working together to try and address community issues. It is important, therefore, not to underestimate the role of social capital in building strong and sustainable communities and providing other benefits. As noted by the New Economics Foundation and Groundwork (2001): there is plenty of

evidence linking social capital with a variety of benefits that may include: finding a job; social integration; better health; decline in crime; better performance at school; better government; and/or higher economic growth.

Implications of Findings

The relationship between adult learner participation and outcomes has been explored for the last three decades by adult education researchers and policy makers alike. The common consensus has been that more hours of adult basic and literacy instruction produce significant gains in achievement test scores (Mikulecky et al., 1996; Comings, Parrella, and Soricone, 1999). However, this study has shown that more hours of instruction in literacy education alone might not be the basis for improved test scores. This study found that the association between hours of literacy instruction and test scores was negative; and that socio-economic factors like labor force status, public assistance, household status, entry income, gender, ethnicity, and residential factors influenced participation in both the U.S. and the UK programs. It was noted, however, that students who scored highest in the TABE, CASAS, and GED subtests might not have participated more than 80 hours; and that intensity of instruction was a bigger factor in students' achievement than duration of participation. Findings from this study also revealed that the vital ingredients that define an effective comprehensive family literacy (U.S.) and family learning (UK) programs are integrated family-focused services for both generations with sufficient intensity and duration of instruction to effect significant changes. Adult basic literacy instruction should be intense, useful, and across generations in order to achieve significant gain.

The results of this research also showed that students who were single heads of households were less likely than dual-headed households to participate intensely. This creates an opportunity for policy makers to plan programs that will target single parents. One may argue that the decline in education and the upsurge in single parental families may have profound consequences for the whole family unit. It is commonly assumed that single headed family households are, on average, more likely to experience family instability than dual-headed households (Carlson, McLanahan, and England, 2004).

Policies towards adult basic and literacy education have changed over time. The Personal Responsibility and Work Opportunity Reconciliation Act of 1996 (PRWORA) shifted the emphasis of federal policy toward a "Work First" approach. The PRWORA Act ended the federal welfare support to underprivileged citizens by imposing a mandatory lifetime limit on welfare receipt; it also shifted the emphasis from job training to job placement, therefore introducing the "Labor Force Attachment (LFA). Under the LFA program, emphasis was placed in immediately assigning people to short-term job search activities with the aim of getting them into the labor market quickly (Hamilton, 2002). The increased focus on gaining employment reflects the changing needs of single parents participating in Adult Basic Education programs and has affected the planning and designing (content) of ABE programs and services. The economic pressures on publicly funded adult learning opportunities make it likely that this trend will be difficult to reverse in the next foreseeable future. This policy shift makes it difficult for students who are single heads of households to persist in literacy programs. These students have to decide between acquiring a job to put food on the table as against going to school. Therefore, programs that focus on enhancing technical and social skills as well as making provisions for

work activities are needed if academic and economically disadvantaged students are expected to be able to enroll and persist in the ABE program.

Limitations

The nature of each adult basic education program varies according to locality and the specific demands of the enrolled ABE students. This variability was a limiting factor in our analyses at the program-level. In the course of our analyses, we noted that there were significant mean differences at the student level; however, at the program-level some programs had fewer students while others had more students. To analyze at the program-level with this wide variability of class size (5 students for some programs and over 600 students for other programs) rendered our study results at the program-level not significant. In addition, the effect size for both reading and math skills were very low due to large sample size; in truth, the programs were contributing to very similar results as this was a small effect. Therefore, the basic threat to external application of this study is the problem of generalizability. That is, the results from this study may not be generalized to other ABE programs in the U.S. and the UK.

This study investigated whether family literacy programs with high bonding and bridging social capital do have higher learner achievement scores than Community ABE/GED programs in Pennsylvania. It used a retrospective “*ex post facto*” design (a retrospective *ex post facto* studies are characterized by the treatment and outcome having already occurred at the time of study initiative). *Ex post facto* designs or “causal-comparative research designs” do not employ

random assignment or random selection of groups and consequently are threatened by potential confounding variables.

In addition, this study assumes that the quality of the social processes and the relationships within which learning take place are especially influential on the quality of learning outcomes. This is consistent with learning that takes place in family literacy programs. However, this causal relationship between quality of social process and learning outcomes may be limited to specific context: family literacy programs that emphasize collaborative learning approach. Therefore, future research could investigate further the real causal relationship between the quality of social process and the quality of learning outcomes by collecting data over time and/or using in-depth interviews.

Finally, in regard to the sample, only adults with 80+ accumulated hours of literacy instruction were included in the research. Due to sample limits a high number of potential adult learners with fewer than 80 hours of instruction who were also well qualified to have been included in this study were excluded. (The criteria for inclusion in the study sample were: students who have no missing demographic data records; no incomplete information about enrollment and test scores; and students who accumulated at least 80 hours of class sessions).

Recommendations for Future Research

The results from this research appear to support many of the findings already included within the existing body of knowledge; nevertheless, it appears that this research study also begins to highlight a potential theoretical framework through which others in the future will pursue further research. This research appears to support the human capital theory which stressed

the significance of education and training as the key to participation in the new global market economy (Fitzsimons, 1997; OECD, 1997b). It also recognized that the theory of human capital alone lacks most of the variables needed to assess adult literacy skills under the adult basic education program. Therefore this study took into account the theory of social capital.

Dika and Singh (2002) reported from their empirical study that social capital indicators and indicators of educational attainment are positively linked. However, in adult basic and literacy education programs, there have not been any such empirical studies that have analyzed factors that contribute to social capital acquisition in both stand alone Community ABE/GED programs and Even Start family literacy programs. As future research begins to synthesize which positive factors influence social capital acquisition in adult basic and literacy education, this study will serve as a catalyst. This study made the assertion that some social arrangements inherent in the family literacy programs promote a different type of learning and that students who participate in family literacy programs stood a better chance of outperforming their counterparts in the Community ABE/GED programs. These students acquired high bonding and bridging social capital.

What also emerged from this study was that students who were head of spouse/partner in two-parent households participated longer and more intensely than those students who were single head of households. Females were more likely than males to participate longer and more intensely; students from larger communities also participated more than those from smaller communities. These findings are consistent with the reports from the research of Kassab et al. (2004). Future research should begin to focus on investigating how ABE programs can attract more single-headed households, males (fathers) and adults from smaller communities. According to Hamilton (2002) people who improved their skills or acquired a GED credential experienced

earning gains relative to people whose skills did not improve or who did not get a credential. The biggest earnings payoff was for those few people who obtained a GED and then received some type of vocational training. Taken together, these results indicate that education and training can benefit both single and dual headed families, females and males, and adults from larger and smaller communities alike.

Conclusion

The Pennsylvania Bureau of Adult Basic Education (ABLE) data were used to investigate the relationship between adult learner participation and outcomes and a comparison study between Community ABE/GED programs and Even Start family literacy adult basic education programs in Pennsylvania. This study compared the results from the Even Start family literacy programs to a similar program (family learning) in Lancashire, UK. This study also used SPSS linear mixed models or hierarchical linear model procedure to investigate whether programs are different. The results depicted that programs based in communities were different and that communities made a difference in student achievements in ABE programs.

Hypotheses tested in this study affirmed the major research questions and the theoretical frame that family literacy programs with high bonding and bridging social capital also have higher achievement test scores than Community ABE/GED programs. Though further research is needed to confirm this finding, this dissertation study contributes to a further understanding of what is entailed in creating bonding and bridging social capital in adult basic and literacy education. This study suggested that educational attainment and grades were positively associated with strong help networks of parents, number of friends known by parents, and

parents' involvement in school. The level of social structures surrounding the family literacy programs promotes strong bonding and bridging social network such as the collaboration of family and child education programs with other community agencies and programs, including social services, health services, and employment services. Finally, this study indicated that though differences existed between the U.S. and the UK programs, both programs made similar progress towards social capital acquisition.

Longstanding traditional family systems, such as dependence on the extended family and the community, are changing. At the same time, government support is quickly eroding. With all these factors working against the adult learner, one question is, how can adult basic and literacy programs offer a promising alternative to ensure continuous participation of learners? The results from this research study reveal the need for further research into how both stand-alone Community ABE/GED and Even Start Family Literacy programs may work to attract potential adult learners with multiple forms of needs.

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APPENDIX A: Correspondence

Mini Proposal - Rose Brandt

Requesting the Use of

PA ABLE BUREAU DATA

Mini Proposal: “Comparing Adult Participation in Stand-Alone ABE and Even Start/Act 143 Adult Basic Education Programs in Pennsylvania: Which Program Model Produces Significant Outcomes?”

Basing his decision on three separate but early national evaluations of Even Start family literacy programs, the President has decided to recommend zero funding for Even Start programs. The evaluations results indicated that adults and children who participated in Even Start generally made gains in literacy skills, but these gains were not significantly greater than those of non-participants. This recommendation has aroused national debate as to the impact of adult basic education coupled with early childhood education in family literacy programs on parents and their children from low-income communities.

For many years, federal and state funding has reflected policymakers’ interest in ensuring a full range of opportunities for adults to attain basic literacy and education credentials, regardless of adults’ backgrounds or initial schooling experiences (Creighton and Hudson, 2002). Therefore eliminating these sources of funding will have an adverse impact on the nation’s poor who want to improve their basic skills and who want to help their children obtain a strong boost in early childhood education.

The purpose of my study, therefore, is to investigate the relationship of ABE program participation in a family literacy model and a stand-alone community ABE program model. This study will specifically examine adult learner participation, retention, intensity, and outcomes of program participation in both types of adult education programs. I will also analyze numerous “barriers” that hinder ABE and family literacy program participants to fully enroll and persist in the program.

My study proposes to analyze ABE program data available from the ABLE Bureau and Even Start/Act 143 family literacy data (available from the Institute for the Study of Adult Literacy) using hierarchical linear modeling (an advanced quantitative technique). Finally, as part of Penn State University’s IRB requirement, NO participant’s name will be identified.

Thank you for allowing me this courtesy in using Pennsylvania Bureau ABLE data. If you need further clarifications, I will not hesitate to schedule an appointment with you to that effect. I appreciate your kindness. Thanks.

APPENDIX B

National Reporting System and Definitions

TOPIC	MEASURES Core Outcome Measures	CATEGORIES or DEFINITIONS
Educational Gains	<ul style="list-style-type: none"> • Educational gains 	<ul style="list-style-type: none"> • Educational functioning levels in reading, writing, speaking and listening and functional areas.
Follow-up Measures	<ul style="list-style-type: none"> • Entered employment • Retained employment • Receipt of secondary school diploma or GED • Placement in postsecondary education or training 	<ul style="list-style-type: none"> • Learners who obtain a job by the end of the first quarter after exit quarter • Learners who remain employed in the third quarter after program exit • Learners who obtain a GED, secondary school diploma or recognized equivalent • Learners enrolling in a postsecondary educational or occupational skills program building on prior services or training received

Core Descriptive and Participation Measures

Demographics	<ul style="list-style-type: none"> • Ethnicity • Gender • Age 	<ul style="list-style-type: none"> • American Indian or Alaskan Native, Asian, Native Hawaiian or Pacific Islander, Black or African American (non-Hispanic), Hispanic or Latino, White (non-Hispanic) • Male, female • Date of birth
Status and Goals	<ul style="list-style-type: none"> • Labor force status • Public assistance status • Rural residency • Disability status • Learner main and secondary reasons or goals for attending 	<ul style="list-style-type: none"> • Employed, non employed, not in labor force • Receiving or not receiving assistance • Rural, not rural • Disability, not disability • Obtain a job, retain a current job, improve current job, earn a secondary school diploma or GED, enter post-secondary education or training, improve basic literacy skills, improve English language skills, citizenship,

		work-based project learner goals, other personal goals
Student Participation	• Contact hours	• Number of hours of instructional activity

Source: The Office of Vocational and Adult Education (OVAE) of the U.S. Department of Education: National Reporting System for Adult Education, August 2002; pp. 1-2).

APPENDIX C
STATISTICAL ANALYSES
TABLES

Table 1

Full Sample Size: Reading Scores

Program_id

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid 101000000000.00	15	.3	.3	.3
1013033720000.00	36	.8	.8	1.1
1013033900000.00	9	.2	.2	1.3
1020274510000.00	32	.7	.7	2.0
1030000000000.00	22	.5	.5	2.5
1030238070000.00	13	.3	.3	2.8
1044351070000.00	7	.2	.2	3.0
1050000000000.00	52	1.1	1.1	4.1
1051263010000.00	6	.1	.1	4.2
1052033700000.00	20	.4	.4	4.7
1052047030000.00	71	1.6	1.6	6.3
1052526020000.00	112	2.5	2.5	8.7
1052533750000.00	51	1.1	1.1	9.9
1066172030000.00	8	.2	.2	10.0
1076533840000.00	46	1.0	1.0	11.1
1080515030000.00	6	.1	.1	11.2
1080705020000.00	37	.8	.8	12.0
1081126070000.00	37	.8	.8	12.8
1081133910000.00	16	.4	.4	13.2
1085633680000.00	12	.3	.3	13.4
1085678070000.00	17	.4	.4	13.8
1090000000000.00	5	.1	.1	13.9
1100000000000.00	27	.6	.6	14.5
1101433880000.00	7	.2	.2	14.7

1101733800000.00	44	1.0	1.0	15.6
1110000000000.00	46	1.0	1.0	16.7
1113133850000.00	39	.9	.9	17.5
1113133940000.00	10	.2	.2	17.7
1120000000000.00	96	2.1	2.1	19.9
1130000000000.00	40	.9	.9	20.8
1133640020000.00	8	.2	.2	20.9
1152133810000.00	5	.1	.1	21.0
1160000000000.00	27	.6	.6	21.6
1164933730000.00	51	1.1	1.1	22.8
1180000000000.00	17	.4	.4	23.1
1184033930000.00	9	.2	.2	23.3
1193574020000.00	8	.2	.2	23.5
1196433950000.00	29	.6	.6	24.2
1211315070000.00	8	.2	.2	24.3
1220000000000.00	10	.2	.2	24.6
1234633830000.00	9	.2	.2	24.8
1234656020000.00	14	.3	.3	25.1
1250000000000.00	8	.2	.2	25.2
1252329100000.00	12	.3	.3	25.5
1265150010000.00	185	4.1	4.1	29.6
1280000000000.00	49	1.1	1.1	30.7
1283200010000.00	23	.5	.5	31.2
1290000000000.00	13	.3	.3	31.5
1295433740000.00	8	.2	.2	31.7
1295433920000.00	10	.2	.2	31.9
2026265000000.00	8	.2	.2	32.1
2027528010000.00	7	.2	.2	32.2
2135137255000.00	14	.3	.3	32.5
2152214530000.00	47	1.0	1.0	33.6
3000244400000.00	57	1.3	1.3	34.8
3000245000000.00	74	1.6	1.6	36.5
3000633300000.00	38	.8	.8	37.3
3000930500000.00	10	.2	.2	37.5
3001509600000.00	16	.4	.4	37.9
3002007400000.00	5	.1	.1	38.0
3002106400000.00	13	.3	.3	38.3
3002219900000.00	43	1.0	1.0	39.2
3002293200000.00	95	2.1	2.1	41.3
3002323100000.00	22	.5	.5	41.8
3002506000000.00	17	.4	.4	42.2
3002530000000.00	103	2.3	2.3	44.5
3002555500000.00	5	.1	.1	44.6
3002581100000.00	37	.8	.8	45.4
3002624100000.00	12	.3	.3	45.6

3003102500000.00	9	.2	.2	45.8
3003315000000.00	27	.6	.6	46.4
3003315100000.00	5	.1	.1	46.6
3003563900000.00	8	.2	.2	46.7
3003637300000.00	13	.3	.3	47.0
3003740600000.00	9	.2	.2	47.2
3003906500000.00	23	.5	.5	47.7
3004324700000.00	25	.6	.6	48.3
3004631300000.00	5	.1	.1	48.4
3004634200000.00	5	.1	.1	48.5
3004695600000.00	16	.4	.4	48.9
3004815700000.00	6	.1	.1	49.0
3004844700000.00	62	1.4	1.4	50.4
3005124500000.00	600	13.3	13.3	63.6
3005127200000.00	26	.6	.6	64.2
3005128300000.00	5	.1	.1	64.3
3005132900000.00	50	1.1	1.1	65.4
3005137300000.00	20	.4	.4	65.8
3005145100000.00	6	.1	.1	66.0
3005156100000.00	65	1.4	1.4	67.4
3005157600000.00	76	1.7	1.7	69.1
3005159300000.00	10	.2	.2	69.3
3005165800000.00	159	3.5	3.5	72.8
3005183400000.00	16	.4	.4	73.2
3005186200000.00	8	.2	.2	73.4
3005191970000.00	7	.2	.2	73.5
3005193750000.00	14	.3	.3	73.8
3005198000000.00	149	3.3	3.3	77.1
3006335100000.00	18	.4	.4	77.5
3006505900000.00	38	.8	.8	78.4
3006566500000.00	20	.4	.4	78.8
3265100160000.00	66	1.5	1.5	80.3
3265100170000.00	35	.8	.8	81.0
4020214090000.00	30	.7	.7	81.7
4041008520000.00	23	.5	.5	82.2
4081110070000.00	98	2.2	2.2	84.4
4101472011080.00	30	.7	.7	85.0
4140677020000.00	66	1.5	1.5	86.5
4152237520000.00	33	.7	.7	87.2
4175955700000.00	11	.2	.2	87.5
4184054520000.00	60	1.3	1.3	88.8
4193546060000.00	9	.2	.2	89.0
4193557040000.00	13	.3	.3	89.3
4204866720000.00	264	5.8	5.8	95.1
4213949520000.00	78	1.7	1.7	96.8

4252325020000.00	33	.7	.7	97.6
4265120020000.00	61	1.3	1.3	98.9
9080701550000.00	6	.1	.1	99.0
9170812350000.00	6	.1	.1	99.2
9174115020000.00	17	.4	.4	99.6
9234600340000.00	6	.1	.1	99.7
9241508130000.00	14	.3	.3	100.0
Total	4524	100.0	100.0	

Table 2

Full Sample Size: Mathematics Scores

Program_id

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid 1010000000000.00	48	2.3	2.3	2.3
1020274510000.00	66	3.1	3.1	5.4
1030000000000.00	13	.6	.6	6.0
1030238070000.00	27	1.3	1.3	7.3
1040000000000.00	14	.7	.7	7.9
1044351070000.00	10	.5	.5	8.4
1050000000000.00	56	2.6	2.6	11.0
1052526020000.00	60	2.8	2.8	13.8
1080705020000.00	108	5.1	5.1	18.9
1081126070000.00	31	1.5	1.5	20.4
1081133910000.00	32	1.5	1.5	21.9
1085678070000.00	32	1.5	1.5	23.4
1090000000000.00	6	.3	.3	23.7
1100000000000.00	47	2.2	2.2	25.9
1101433880000.00	10	.5	.5	26.4
1110000000000.00	64	3.0	3.0	29.4
1113133940000.00	15	.7	.7	30.1
1120000000000.00	72	3.4	3.4	33.5
1126791070000.00	5	.2	.2	33.7
1130000000000.00	59	2.8	2.8	36.5
1152116030000.00	61	2.9	2.9	39.4
1160000000000.00	36	1.7	1.7	41.1
1174133860000.00	8	.4	.4	41.4
1180000000000.00	10	.5	.5	41.9
1196433950000.00	11	.5	.5	42.4
1211315070000.00	12	.6	.6	43.0
1250000000000.00	9	.4	.4	43.4
1265150010000.00	116	5.5	5.5	48.9
1280000000000.00	28	1.3	1.3	50.2
1283200010000.00	5	.2	.2	50.4
1290000000000.00	43	2.0	2.0	52.4
2011361565000.00	5	.2	.2	52.7
3000244400000.00	39	1.8	1.8	54.5
3000245000000.00	21	1.0	1.0	55.5

300041480000.00	5	.2	.2	55.7
300200740000.00	9	.4	.4	56.2
300210640000.00	9	.4	.4	56.6
300229320000.00	27	1.3	1.3	57.9
300232310000.00	5	.2	.2	58.1
300253000000.00	8	.4	.4	58.5
300262410000.00	22	1.0	1.0	59.5
300310250000.00	5	.2	.2	59.7
300331500000.00	5	.2	.2	60.0
300374060000.00	7	.3	.3	60.3
300390650000.00	8	.4	.4	60.7
300512450000.00	25	1.2	1.2	61.9
300512720000.00	30	1.4	1.4	63.3
300512830000.00	15	.7	.7	64.0
300513290000.00	57	2.7	2.7	66.7
300515760000.00	15	.7	.7	67.4
300515930000.00	14	.7	.7	68.0
300518620000.00	10	.5	.5	68.5
300519375000.00	13	.6	.6	69.1
300633510000.00	11	.5	.5	69.6
300650590000.00	17	.8	.8	70.4
300656650000.00	79	3.7	3.7	74.2
326510017000.00	32	1.5	1.5	75.7
402020952000.00	7	.3	.3	76.0
408111007000.00	66	3.1	3.1	79.1
4101472011080.00	26	1.2	1.2	80.3
417595570000.00	10	.5	.5	80.8
418405452000.00	31	1.5	1.5	82.3
419354606000.00	6	.3	.3	82.5
419355704000.00	44	2.1	2.1	84.6
420486672000.00	145	6.8	6.8	91.4
421394952000.00	80	3.8	3.8	95.2
422090752000.00	4	.2	.2	95.4
425232502000.00	43	2.0	2.0	97.4
426512002000.00	55	2.6	2.6	100.0
Total	2124	100.0	100.0	

Table 3

Univariate Analysis of Variance: Mathematics Scores

Between-Subjects Factors

		N
type of program: CmABE=0; FL=1	.00	1571
	1.00	553

Descriptive Statistics

Dependent Variable: math scores for both programs

type of program: CmABE=0; FL=1	Mean	Std. Deviation	N
.00	487.9669	100.51909	1571
1.00	498.3318	88.33295	553
Total	490.6655	97.57892	2124

Tests of Between-Subjects Effects

Dependent Variable: math scores for both programs

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power(a)
Corrected Model	43941.942(b)	1	43941.942	4.623	.032	.002	4.623	.575
Intercept	397890663.580	1	397890663.580	41859.323	.000	.952	41859.323	1.000
type_of_program_Cm ABE_0_FL_1	43941.942	1	43941.942	4.623	.032	.002	4.623	.575
Error	20170512.139	2122	9505.425					
Total	531573024.750	2124						
Corrected Total	20214454.080	2123						

a Computed using alpha = .05

b R Squared = .002 (Adjusted R Squared = .002)

Univariate Analysis of Variance: Reading Scores

Between-Subjects Factors

		N
type of program: CmABE=0; FL=1	.00	3793
	1.00	731

Descriptive Statistics

Dependent Variable: reading scores for all programs

type of program: CmABE=0; FL=1	Mean	Std. Deviation	N
.00	448.2584	138.42764	3793
1.00	489.0479	106.49858	731
Total	454.8492	134.61520	4524

Tests of Between-Subjects Effects

Dependent Variable: reading scores for all programs

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power(a)
Corrected Model	1019705.067(b)	1	1019705.067	56.968	.000	.012	56.968	1.000
Intercept	538444133.480	1	538444133.480	30081.078	.000	.869	30081.078	1.000
type_of_program _CmABE_0_FL _1	1019705.067	1	1019705.067	56.968	.000	.012	56.968	1.000
Error	80942724.121	4522	17899.762					
Total	1017923012.000	4524						
Corrected Total	81962429.187	4523						

a Computed using alpha = .05

b R Squared = .012 (Adjusted R Squared = .012)

Table 4

Reading and Mathematics Unconditional Models

The SAS System: Reading Scores
The Mixed Procedure

Model Information

Data Set	WORK.ONE
Dependent Variable	rscores
Covariance Structure	Variance Components
Subject Effect	pid
Estimation Method	REML
Residual Variance Method	Profile
Fixed Effects SE Method	Model-Based
Degrees of Freedom Method	Containment

Dimensions

Covariance Parameters	2
Columns in X	1
Columns in Z Per Subject	1
Subjects	121
Max Obs Per Subject	600

Number of Observations

Number of Observations Read	4524
Number of Observations Used	4524

Number of Observations Not Used 0

Iteration History

Iteration	Evaluations	-2 Res Log Like	Criterion
0	1	57191.64453448	
1	2	54074.12718594	0.00000014
2	1	54074.12395929	0.00000000

Convergence criteria met.

Covariance Parameter Estimates

Cov Parm	Subject	Standard Estimate	Z Error	Value	Pr Z
Intercept	pid	8957.19	1227.94	7.29	<.0001
Residual		8364.35	178.26	46.92	<.0001

THE RANDOM COEFFICIENT, $\tau_{00} = 8957.19$, is significant. Programs vary randomly. The question now becomes, Does type of program (0 = Community; 1= Family) explain the differences?

The intraclass correlation coefficient is $(8957.19)/(8957.19 + 8364.35) = .517$ This means that approximately 52 percent of the variance in students' reading scores is attributed to the programs in which they were enrolled.

The SAS System: Mathematics Scores

The Mixed Procedure

Model Information

Data Set	WORK.ONE
Dependent Variable	mathscore
Covariance Structure	Variance Components
Subject Effect	pid
Estimation Method	REML
Residual Variance Method	Profile
Fixed Effects SE Method	Model-Based
Degrees of Freedom Method	Containment

Dimensions

Covariance Parameters	2
Columns in X	1
Columns in Z Per Subject	1
Subjects	68
Max Obs Per Subject	145

Number of Observations

Number of Observations Read	2124
Number of Observations Used	2124
Number of Observations Not Used	0

Iteration History

Iteration	Evaluations	-2 Res Log Like	Criterion
0	1	25481.87942466	
1	2	24793.28505884	0.00001980
2	1	24793.06021549	0.00000042
3	1	24793.05573394	0.00000000

Convergence criteria met.

Covariance Parameter Estimates

Cov Parm	Subject	Estimate	Standard Error	Z Value	Pr > Z
Intercept	pid	3512.74	671.34	5.23	<.0001
Residual		6352.19	198.04	32.08	<.0001

Programs differ randomly given mathematics scores as the dependent variable, $\tau_{00} = 3512.74$, $Z = 5.23$, $p < .0001$. The intraclass correlation coefficient is $3512.74 / (3512.74 + 6352.19) = 3512.74 / 9864.93 = 35.61$ percent of variance due to differences in programs.

The SAS System
The GLM Procedure

Class Level Information

Class	Levels	Values
type	2	0 1

Number of Observations Read	4524
Number of Observations Used	4524

The SAS System

The GLM Procedure

Dependent Variable: rscores

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	1	1020535.16	1020535.16	57.01	<.0001
Error	4522	80945784.72	17900.44		
Corrected Total	4523	81966319.89			

Type of program does affect students' reading scores, $F(1, 4522) = 57.01$, $p < .0001$, $MS_{error} = 17900.44$

R-Square	Coeff Var	Root MSE	rscores Mean
0.012451	29.40109	133.7925	455.0597

Source	DF	Type I SS	Mean Square	F Value	Pr > F
type	1	1020535.163	1020535.163	57.01	<.0001

Source	DF	Type III SS	Mean Square	F Value	Pr > F
type	1	1020535.163	1020535.163	57.01	<.0001

The SAS System

The GLM Procedure

Level of type	N	-----rscores-----	
		Mean	Std Dev
0	3793	448.466122	138.427697
1	731	489.272230	106.517854

The means show that students enrolled in the family programs have higher means than students enrolled in the community programs.

Table 5

The SAS System: Reading Skills
The Mixed Procedure

Model Information

Data Set	WORK.ONE
Dependent Variable	rcores
Covariance Structure	Variance Components
Subject Effect	pid
Estimation Method	REML
Residual Variance Method	Profile
Fixed Effects SE Method	Model-Based
Degrees of Freedom Method	Between-Within

Dimensions

Covariance Parameters	2
Columns in X	4
Columns in Z Per Subject	1
Subjects	121
Max Obs Per Subject	600

Number of Observations

Number of Observations Read	4524
Number of Observations Used	4524
Number of Observations Not Used	0

Iteration History

Iteration	Evaluations	-2 Res Log Like	Criterion
0	1	57109.71817281	
1	3	54058.17538587	0.00004641
2	1	54056.97442166	0.00000255
3	1	54056.91373625	0.00000001

Convergence criteria met.

Covariance Parameter Estimates

Cov Parm	Subject	Estimate	Standard Error	Z Value	Pr > Z
Intercept	pid	8993.80	1247.06	7.21	<.0001
Residual		8364.93	178.27	46.92	<.0001

The SAS System
The Mixed Procedure

Fit Statistics

-2 Res Log Likelihood	54056.9
AIC (smaller is better)	54060.9
AICC (smaller is better)	54060.9
BIC (smaller is better)	54066.5

Solution for Fixed Effects

Effect	Estimate	Standard Error	DF	t Value	Pr > t
Intercept	507.93	44.6064	119	11.39	<.0001
type	26.0908	25.1855	119	1.04	0.3023
ses	-15.1525	15.7654	4401	-0.96	0.3365
hours	-0.09892	0.3048	4401	-0.32	0.7455

The fixed effects, γ_{01} (type of program), γ_{02} (program ses), and γ_{03} (avg. hours of program instruction) are not significant. These variables, therefore, do not tell us why the programs differ. As a result, differences due to type of program can now be modeled at the student-level, rather than the program-level.

Type 3 Tests of Fixed Effects

Effect	Num DF	Den DF	F Value	Pr > F
type	1	119	1.07	0.3023
ses	1	4401	0.92	0.3365
hours	1	4401	0.11	0.7455

The SAS System: Mathematics Skills
The Mixed Procedure

Model Information

Data Set	WORK.ONE
Dependent Variable	mathscore
Covariance Structure	Variance Components
Subject Effect	pid
Estimation Method	REML
Residual Variance Method	Profile
Fixed Effects SE Method	Model-Based
Degrees of Freedom Method	Between-Within

Dimensions

Covariance Parameters	2
Columns in X	4
Columns in Z Per Subject	1
Subjects	68

Max Obs Per Subject 145

Number of Observations

Number of Observations Read	2124
Number of Observations Used	2124
Number of Observations Not Used	0

Iteration History

Iteration	Evaluations	-2 Res Log Like	Criterion
0	1	25462.48626471	
1	2	24779.54504161	0.00001500
2	1	24779.37602922	0.00000026
3	1	24779.37330553	0.00000000

Convergence criteria met.

Covariance Parameter Estimates

Cov Parm	Subject	Estimate	Standard Error	Z Value	Pr Z
Intercept	pid	3690.14	717.94	5.14	<.0001
Residual		6352.04	198.03	32.08	<.0001

The SAS System
The Mixed Procedure

Fit Statistics

-2 Res Log Likelihood	24779.4
AIC (smaller is better)	24783.4
AICC (smaller is better)	24783.4
BIC (smaller is better)	24787.8

Solution for Fixed Effects

Effect	Estimate	Standard Error	DF	t Value	Pr > t
Intercept	500.21	36.5956	65	13.67	<.0001
type	4.9924	19.6997	65	0.25	0.8007
ses	-2.7964	12.3094	65	-0.23	0.8210
hours	-0.03618	0.2459	2055	-0.15	0.8831

As you can see, none of the predictors were significant as Level-2, program-level, independent variables, p 's > .80. Model the influence of these variables at the student level.

Type 3 Tests of Fixed Effects

Effect	Num DF	Den DF	F Value	Pr > F
type	1	65	0.06	0.8007
ses	1	65	0.05	0.8210
hours	1	2055	0.02	0.8831

Table 6

Students Level Data Analysis

Correlations

		students test score	students instruction hours	SES student low=1; medium=2; high=3
students test score	Pearson Correlation	1	-.055(**)	-.031(*)
	Sig. (2-tailed)		.000	.035
	N	4676	4676	4676
students instruction hours	Pearson Correlation	-.055(**)	1	.130(**)
	Sig. (2-tailed)	.000		.000
	N	4676	4676	4676
SES student low=1; medium=2; high=3	Pearson Correlation	-.031(*)	.130(**)	1
	Sig. (2-tailed)	.035	.000	
	N	4676	4676	4676

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

Nonparametric Correlations

Correlations

			students test score	students instruction hours	SES student low=1; medium=2; high=3
Spearman's rho	students test score	Correlation Coefficient	1.000	-.068(**)	-.033(*)
		Sig. (2-tailed)	.	.000	.022
		N	4676	4676	4676
	students instruction hours	Correlation Coefficient	-.068(**)	1.000	.087(**)
		Sig. (2-tailed)	.000	.	.000
		N	4676	4676	4676
	SES student low=1; medium=2; high=3	Correlation Coefficient	-.033(*)	.087(**)	1.000
		Sig. (2-tailed)	.022	.000	.
		N	4676	4676	4676

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

Correlations

type of program: CmABE=0; FL=1			students test score	students instruction hours	SES student low=1; medium=2; high=3
.00	students test score	Pearson Correlation	1	-.066(**)	-.031(*)
		Sig. (2-tailed)		.000	.048
		N	3937	3937	3937
	students instruction hours	Pearson Correlation	-.066(**)	1	.133(**)
		Sig. (2-tailed)	.000		.000
		N	3937	3937	3937
SES student low=1; medium=2; high=3	Pearson Correlation	-.031(*)	.133(**)	1	
	Sig. (2-tailed)	.048	.000		
	N	3937	3937	3937	
1.00	students test score	Pearson Correlation	1	.024	.001
		Sig. (2-tailed)		.509	.969
		N	739	739	739
	students instruction hours	Pearson Correlation	.024	1	.112(**)
		Sig. (2-tailed)	.509		.002
		N	739	739	739
SES student low=1; medium=2; high=3	Pearson Correlation	.001	.112(**)	1	
	Sig. (2-tailed)	.969	.002		
	N	739	739	739	

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

Nonparametric Correlations

Correlations

type of program: CmABE=0; FL=1				students test score	students instruction hours	SES student low=1; medium=2; high=3
.00	Spearman's rho	students test score	Correlation Coefficient	1.000	-.082(**)	-.034(*)
			Sig. (2-tailed)	.	.000	.031
			N	3937	3937	3937
		students instruction hours	Correlation Coefficient	-.082(**)	1.000	.079(**)
			Sig. (2-tailed)	.000	.	.000
			N	3937	3937	3937
		SES student low=1; medium=2; high=3	Correlation Coefficient	-.034(*)	.079(**)	1.000
			Sig. (2-tailed)	.031	.000	.
			N	3937	3937	3937
1.00	Spearman's rho	students test score	Correlation Coefficient	1.000	-.028	-.002
			Sig. (2-tailed)	.	.445	.952
			N	739	739	739
		students instruction hours	Correlation Coefficient	-.028	1.000	.145(**)
			Sig. (2-tailed)	.445	.	.000
			N	739	739	739
		SES student low=1; medium=2; high=3	Correlation Coefficient	-.002	.145(**)	1.000
			Sig. (2-tailed)	.952	.000	.
			N	739	739	739

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

Table 7

Independent Sample Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Diff.	95% Confidence interval of the Difference	
									Lower	Upper
scores on reading	Equal variance assumed	193.37	.000	-7.83	4674	.000	-42.06	5.371	-52.585	-31.525
	Equal variance not assumed			-9.38	1262.4	.000	-42.06	4.484	-50.851	-33.259
scores on math	Equal variance assumed	7.40	.007	-2.24	2250	.025	-10.63	4.745	-19.933	-1.321
	Equal variance not assumed			-2.38	1099.9	.017	-10.63	4.459	-19.376	-1.877
scores on listening	Equal variance assumed	.04	.844	-1.78	467	.075	-3.53	1.981	-7.424	.360
	Equal variance not assumed			-1.85	20.9	.079	-3.53	1.915	-7.515	.451

The Independent Sample Test provides two statistical tests. In the left two columns of numbers is the Levene test for the assumption that the variances of the two groups are equal (this only assesses an assumption). If the F test is not significant (as is true for listening skills; .84), the assumption is not violated, and the “Equal variance assumed” line was used for the t test and related statistics. However, if Levene’s F is statistically significant at alpha .05 level (as in the case of reading skills and total mathematics) the variances are significantly different and the assumption of equal variances is violated. Therefore, the “Equal variance not assumed” line was used.

The *t* in scores on listening is not statistically significant ($p = .075$) so we conclude that there is no difference between Community ABE programs and Family Literacy programs. However for scores on reading, the $t = -9.38$, degree of freedom (df) = 1262.39, and $p = .001$; and for scores on math, the $t = -2.38$, $df = 1099.85$, and $p = .017$. We therefore conclude that, there are differences between Community ABE programs and Family Literacy programs.

Since the assumption of equal variances is violated, we run the appropriate nonparametric statistic, which in this case is called the Mann-Whitney (M-W) U test. The M-W is used with a between group design with two levels of independent variable. The Mann-Whitney test is a nonparametric test to compare two unpaired groups. This test is an alternative to the independent group t-test, when the assumption of normality or equality of variance is not met.

Non Parametric Test: Mann Whitney U

Ranks

	CmABE=0; FL=1	N	Mean Rank	Sum of Ranks
scores on reading	.00	3937	2287.31	9005140.00
	1.00	739	2611.21	1929686.00
	Total	4676		
scores on math	.00	1683	1116.01	1878237.50
	1.00	569	1157.54	658640.50
	Total	2252		
scores on listening	.00	449	232.64	104453.50
	1.00	20	288.08	5761.50
	Total	469		

The above table shows the mean or average ranks for Community ABE and Family Literacy programs on each of the three dependent variables. SPSS ranks the students from 4,676 (highest) to 1 (lowest) for “reading skills,” 2,252 (highest) to 1 (lowest) for “total mathematics,” and 469 (highest) to 1 (lowest) for “listening skills,” so that, in contrast to the typical ranking procedure, a high mean rank indicates the group scored higher.

On all three subtests (reading skills, total mathematics, and listening skills) Family Literacy ranks higher than Community ABE.

Test Statistics (a)

	scores on reading	scores on math	scores on listening
Mann-Whitney-U	1253187.000	461151.500	3428.500
Wilcoxon-W	9005140.000	1878237.500	104453.500
Z	-5.985	-1.317	-1.790
Asymp. Sig. (2-tailed)	.000	.188	.073

a Grouping Variable: CmABE=0; FL=1

This table provides the Mann-Whitney U, z score, and the Sig. (significance) level or *p*, values. Note that the mean ranks of the programs differ significantly on reading skills, but not on total mathematics and listening skills.

Curriculum Vitae

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2003 Cleveland State University, Ohio
M Ed.: Adult Learning & Development; 3.56 GPA
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2002 Cleveland State University, Ohio
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PROFESSIONAL EXPERIENCE

2003 - 2005	Penn State University, University Park, PA	Instructor
	Penn State University, University Park, PA	Research Assistant
	Penn State University, University Park, PA	Teaching Assistant

INTERNSHIP EXPERIENCE

Jan '03 - May '03	Lorain County Community College	Research Internship
Nov '02 - Apr '03	Cuyahoga County Employment Alliance	Teaching Internship

OTHER EXPERIENCE

2000 - 2002	Canada Youth Challenge, Ontario, Canada	Program Coordinator
Spring 2001	Wong Margaret W & Assoc., Cleveland, Ohio	Accountant
1998 - 1999	Iron Mountain Co. (ADS), Strongsville, Ohio	Librarian
1997 - 2000	Review and Heralds Publishing Association, MD	Publishing
1992 - 1997	College Health Foods; Trinidad/Jamaica W.I.	Accounting/Auditing
1985 - 1992	Literature Ministry Seminary, Ghana	Business Manager

Computers - Microsoft Word, Excel, Power Point, Internet, and Accounting Software Packages

References Available Upon Request