

RESEARCH PLAN**A. Specific Aims****Goals and Objectives**

Project PATHS will engage underserved high school students in culturally appropriate health promotion activities and experiences. Students will engage in personal health promotion and science programs and experiences that will impact their lifestyle behaviors and choices. These activities also will pique their interests in health and science so that they will continue their high school enrollment with the long range goal of enrolling in a university with the expectation of entering a health/science profession upon graduation (e.g., medicine, nursing, biochemistry, biology, dietetics, kinesiology, health promotion, and physical therapy). In addition, project PATHS will implement a broad variety of activities that will provide role models, hand-on experiences, mentoring, and field trips to academic institutions with the aim of increasing participants' knowledge and interests in health/science professions. Project PATHS will impact personal health characteristics and influence health disparities often reflected in underserved populations. The intent is to address specific goals of Healthy People 2010 related to health risk behaviors and disparities found in underserved populations (Healthy People 2010, USDHHS, 2000). The Health Resources and Services Administration cites several strategies of Healthy People 2010 for elementary, junior high, and high schools to achieve greater minority representation in the health/science professions. These strategies include: 1) developing comprehensive programs to promote health career opportunities to youth of all ages, parents, and schools; and 2) promoting health/science professions in high schools with high minority populations (HRSA, 2001). Project PATHS will use this approach.

The two primary goals of Project PATHS are to:

- 1) Increase the representation of Hispanics in the health/science professions; and
- 2) Promote health-related lifestyle changes.

The proposed program will partner with University of North Texas (UNT) including the Departments of Biological Sciences and Chemistry and The University of North Texas Health Science Center (UNTHSC) including the School of Public Health, the Texas College of Osteopathic Medicine and the Graduate School of Biomedical Sciences. Other outreach partners include Texas Woman's University, The Cooper Institute and University of Texas Southwestern Medical Center. The proposed program will also utilize existing resources from the North Texas *Salud para su Corazón* (Health for your Heart) Outreach Initiative to achieve the proposed objectives. The following specific objectives for Project PATHS are to:

- 1) Increase the number of Hispanic students taking college entrance exams by 10%. According to the Texas Education Agency 22% of the Hispanic students at the intervention sites took the college entrance exams in 2001.
- 2) Increase the number of Hispanic students who report interest in health/science professions by 10%. According to a pilot survey only 13% of the Hispanic students in the target school expressed interest in health/science profession careers.
- 3) Improve participants' healthy lifestyles related to Healthy People 2010 Leading Health Indicators. A pre-post test design will be the primary evaluation approach for this objective.

B. Background and Significance

Hispanic Population Growth

The Hispanic population of the United States is one of the fastest growing minority groups. According to the United States Bureau of the Census, the Hispanic population grew from 14.6 million in 1980 to 26.9 million in 1995, representing an 85% growth in this ethnic group. According to the 2000 U.S. Census, Hispanics comprised 12.5% of the U.S. population and are expected to exceed 20% of the population by 2035. Over 75% of Hispanics live in five states, California, **Texas**, New York, Florida, and Illinois. Hispanics represented 32% of the population in the state of Texas. Already more than half of those below age 25 in Texas are minorities and projections estimate that by 2008 current minority populations in Texas, vastly Hispanic, will become the majority. Demographic studies conducted for the Texas Legislature documented the alarming implications of projected population changes and the resulting demands for state public services (Murdock, Hoque, Michael, White, & Pecotte, 1996). Households in poverty are projected to increase and the percent of the population with high school, baccalaureate, and graduate degrees is expected to decline. The likelihood that students will successfully complete their education rises with family income and parental education (USDHHS, 2000). Many high schools in the United States are experiencing financial and social pressures to help students graduate with the necessary skills to be successful in college. Unfortunately, low-income individuals are the fastest growing segment of Texas' population. Ranked eighth among states in poverty in 1990, Texas rose to fourth place in 1994, adding hundreds of thousands of new residents to poverty in four years during a time when the overall U.S. poverty level declined. Texas ranks second among states in the number and percent of children under 18 years of age living below the poverty level (Murdock et al., 1996).

Health Risk Behaviors and Disparities in Minorities

Hispanics face health disparities in exposure to morbidity and mortality from violent crime, accidents, diabetes, and risk factors of obesity and physical inactivity (USDHHS, 2000). The leading cause of death for Hispanics is cardiovascular disease (CVD). In addition, the Hispanic adult population has been particularly susceptible to higher levels of obesity, which may lead to an increased potential for diabetes and coronary heart disease (Despres, Bouchard, & Malina, 1990). This population is generally unaware of important lifestyle or behavioral changes that can prevent CVD (Alcalay, Alvarado, Balcazar, Newman, & Huerta, 1999; USDHHS, 2000). The increased risk of CVD and obesity for this population begins in childhood and continues into adolescence and adulthood (USDHHS, 2000). Approximately 15% of male and 14% of female Hispanic population ranging from 12 to 18 years of age are overweight (USDHHS, 2000). Results related to sociodemographic and physical activity factors, using both objective and self-report measures, indicate that Hispanic children are less active than non-Hispanic White children (Sallis, McKenzie, Elder, Hoy, Galati, Berry, Zive, & Nadar, 1998; USDHHS, 2000). Hispanic children were found to engage in 17% less moderate to vigorous physical activity than non-Hispanic White children (McKenzie, Sallis, Elder, Berry, Hoy, Nader, Zive, & Broyles, 1997). While the passing rates of Hispanic youth in the Dallas-Fort Worth area for the 1-mile run compared favorably to that of the children in the National Children and Youth Fitness Studies (NCYFS), the passing rates of body mass index (BMI) of those same Hispanic youth were lower than the children in the NCYFS (Weiller, Jackson, & Meyer, 1994).

Educational Attainment in Minority Students

Significant gaps between the high school graduation rates of minority and White students remain even after holding students' social class, English-language proficiency, and immigrant status constant (National Center for Education Statistics [NCES], 1995). This is true across economically disadvantaged populations, although the odds of completing high school are even lower for Hispanic immigrants and those with limited English proficiency compared with the U.S. population (Krashen, 1998; NCES, 1998; Reyes, Scribner, & Scribner, 1999; Secada, Chavez-Chavez, Garcia, Munoz, Oakes, Santiago-Santiago, & Slavin, 1998; White House Initiative on Educational Excellence for Hispanics, 1999). Many schools and communities across the

country, both those that have long served economically disadvantaged students and those that have new and growing populations (such as in the Dallas-Fort Worth area), are taking steps to improve the likelihood that they reach the same high standards expected of all students.

Hispanics are vastly underrepresented in the attainment of educational degrees at the high school, college, and graduate degree levels. Only 20% of the adult population in Texas has earned a college degree. This percentage is lower in Hispanic adults. This educational problem is particularly evident in all types of health/science professions. The total enrollment of Hispanics in schools for selected health occupations was 3.7% during the 1997-98 academic year, which is a decline from 6.6% in 1990-91 academic year (USDHHS, 2000). Data from 1997-1998 (National Center for Health Statistics, 2000) indicated Hispanics represent only 4.9% of dentistry students, 6.6% of allopathic medicine students, 4.0% of osteopathic medicine students, 3.9% of nursing students, 3.9% of optometry students, 3.5% of pharmacy students, and 3.7% of podiatry students. A report from The National Science Foundation (NSF, 2001) indicated that in 1998, 6.5% of Hispanic students earned bachelor's degrees related to science and engineering, 3.5% earned master's degrees and 2.8% earned doctoral degrees. The American Medical Association (AMA, 2001) reports that 6.5% of medical students are Hispanic/Latino. The University of North Texas (UNT) reflects this trend, as less than 10% of the 1800 Hispanic students choose a major potentially leading to a health/science related profession (e.g., biology, chemistry, gerontology, kinesiology, and health promotion).

High school students in southwest Dallas are performing below academic levels to be adequately prepared for post-secondary education. Of the students attending southwest Dallas high schools, 98% are considered minorities with approximately 85% of the student population being Hispanic. The Principal at North Dallas High School (NDHS), located in southwest Dallas, indicates that only 22% of the students' parents report receiving some college education. Critical to the goals of Project PATHS are the following results reported by the Texas Education Agency for Hispanic children at NDHS for the 2000-2001 academic year:

- 1) In the Texas Assessment of Academic Skills program only 54% of the children passed all three tests, reading, writing, and mathematics compared to a state-passing rate of 80%.
- 2) Only 13% of the students passed the end-of-course exam in Algebra I and 56% passed the end-of-course exam in Biology compared to state passing rates of 49% and 80%, respectively.
- 3) Only 22% of the students sat for the SAT or ACT college entrance examinations compared to the state percentage of 62%.

In a pilot survey of 333 Hispanic 9th grade students at NDHS, the target school of Project PATHS, 15% to 76% ($M = 41\%$) of the students reported little knowledge about a wide range of core health/science professions. In another question, 52% to 87% ($M = 74\%$) of the students expressed no interest in potential careers in the same core health/science professions. Of the 333 Hispanic students surveyed, 85% indicated that they planned to attend college and 62% reported that they planned to graduate from a four-year college/university. An aim of Project PATHS is to increase the number of Hispanic students in the target school who enter into educational preparation for a health/science-based career to at least 10% of the Hispanic students at NDHS. From the 1296 Hispanic students enrolled at NDHS, this goal would produce about 140 Hispanic students interested in health/science professions and achieving the education necessary for such a degree (i.e., representative of the U. S. Hispanic population).

Hispanic Representation in the Health/Science Professions

Although Hispanics represent 12.5% of the U.S. population (2000 U.S. Census), they are underrepresented in many health/science professions. The 2001 RN Sample Survey (Minority Nurse, 2001) indicates that Hispanics represent only 2.0% of registered nurses nationwide. According to the National Center

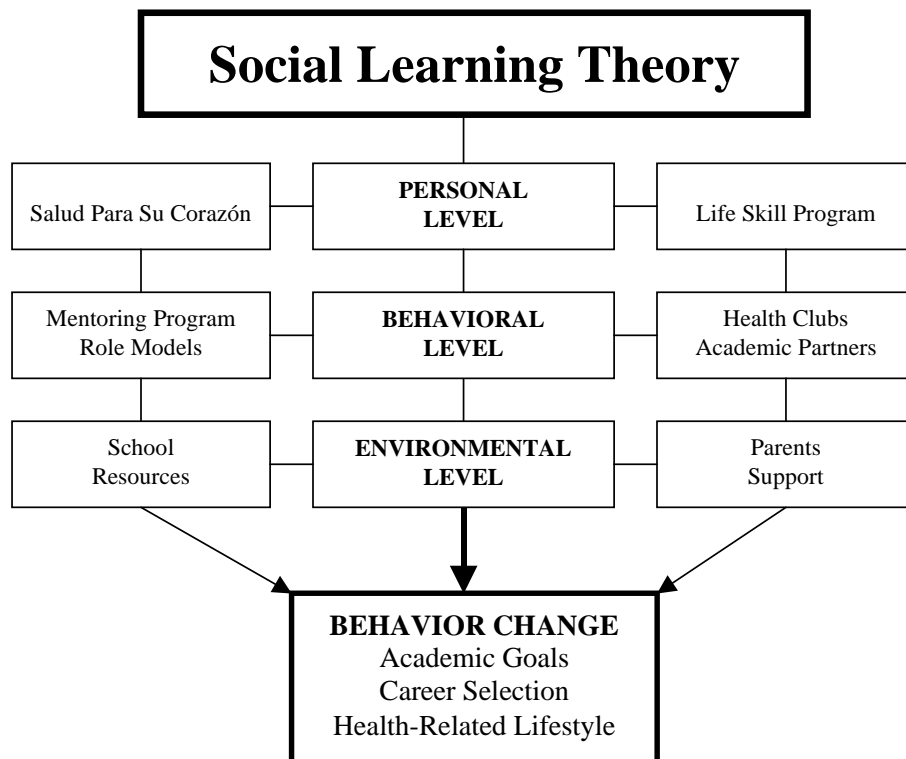
for Health Workforce Information and Analysis, in 1999-2000, Hispanics were the only race/ethnicity for which the percent employed in each of the health/science professions (e.g., physicians, dentists, and occupational therapists) is less than the overall percent makeup of the total population (Health Resources and Services Administration, 2001).

Simpson and Aronoff (1988) suggested that there would be an increase in the number of Black and Hispanic physicians between 1985 and 2000. However, this does not appear to have occurred relative to the population. The declining number and proportion of minorities in medicine was reported by Petersdorf, Turner, Nickens, and Ready (1990) wherein they suggest there were strong gains in the 1970s that are now being reversed. A method of encouraging and interesting Hispanic students to enter science-based professions could effectively increase the likelihood of students viewing these professions as viable career choices. Given the underrepresentation of health/science professionals, role models may not be available to Hispanic students.

Project PATHS will bring Hispanic role models from health/science professions to visit with students and parents. Through the Health Alliances and network partners of the North Texas *Salud para su Corazón* project, students will have a variety of opportunities to visit and interact with Hispanic health/science professionals. Additionally, students and parents will have field trips to agencies and institutions that include engaging presentations given by health/science professionals and students of Hispanic origin. The North Texas *Salud para su Corazón* project has a variety of community, neighborhood and family-based activities that will connect students with a variety of Hispanic health care professionals. These activities are intended to enlighten students about the career possibilities in health/science professions and the academic background necessary for entry into a professional school. Students will also have opportunities to apply *Salud para su Corazón* educational activities with their own families, friends, and neighbors.

Educational Approach/Strategy to Influence Student Lives

Figure 1. Ecological Model



The focus of the educational intervention is based on an ecological model of social learning theory that includes personal, behavioral and environmental level of interventions.

1) *Personal Level Intervention.* A culturally competent educational curriculum will be implemented. Culturally appropriate, bilingual, educational materials and activities and dissemination strategies from the North Texas *Salud para su Corazón* Latino Community Cardiovascular Disease Preventive and Outreach Initiative from the National Heart, Lung, and Blood Institute will be age-adapted and utilized. The strategy for instruction is to present educational materials, learning activities, health/science related lectures and field trips to 9th grade students during their Life Skills and Health classes.

The Life Skills Class, to be taken in the fall term of the 9th grade introduces students to many of the tools students need in order to succeed in the future. The class provides students with the skills they need to be prepared mentally/academically for their future. Lessons they receive from the *Salud para su Corazón* curriculum complement this and will help them to be prepared physically. Specific lessons they will receive include time management, note taking strategies and motivation and goal setting (see Career Connections outline in Appendix). These activities will improve participants' knowledge and skills about healthy lifestyle behaviors and will predispose students for improving their health risk behaviors. In addition, the high school students will be responsible for disseminating information to others (peers, siblings, parents/guardians, etc.).

2) *Behavioral Level Intervention.* Students will be exposed to a variety of activities that will enable them to adopt healthy lifestyle behaviors and develop interest in health/science profession careers. A Health/Science Professions Club will be created to give interested students the opportunity to attend health/science lectures and field trips as well as plan and deliver a *Salud para su Corazón* community outreach program. Various partners will be used to engage students in experiences related to health (see Letters of Support in Appendix).

3) *Environmental Level Interventions.* Partners will include universities, allied health and biomedical training institutes, and community agencies. The program will also be based upon interactions with parents and the community. Through the delivery of health information, programs, interventions, and resources, students will be prepared, encouraged, and expected to change their lifestyle behaviors and ultimately view health/science-based careers as viable choices upon graduation from high school or college. Students will be exposed to the following activities and programs. A mentoring program will be developed which includes participation of several student associations, including UNT Latino student associations. Additionally, participants will be exposed a variety of outreach programs currently being implemented at UNT Health Science Center including the Summer Multicultural Advanced Research Training (SMART) and the Ronald E. McNair Post-baccalaureate Achievement Program. These initiatives will provide a supporting environment for facilitating enrollment of students at the college level. In addition, the School of Public Health is developing a collaborative partnership with the Hispanic Healthcare Professionals Association (HISPA). HISPA is organized exclusively for charitable, educational and scientific purposes. HISPA's primary goal is to promote and enhance the health and well being of the Hispanic community. Moreover, HISPA has been working with Hispanic students for more than 10 years and is concerned with educational scholarship and the professional development of healthcare providers/practitioners.

Why this Strategy and Population?

As indicated, the Hispanic population has an increased risk for a variety of debilitating diseases. A contributing factor is the lack of representation of Hispanics in the health/science professions. Project PATHS is based on the interaction of students, their parents, the community, as well as various university and health organization partnerships. The intervention components of Project PATHS will build on current existing projects and experiences.

Lifestyle behaviors that are adopted during adolescence can be tracked into adulthood. Thus, interventions in healthy lifestyles should begin as early in life as possible. Physical activity and healthy eating are lifestyle behaviors that can be adopted in youth and maintained for years. Adoption of these behaviors is often based on the Transtheoretical Model (TTM or Stages of Change: Prochaska & Velicer, 1997; Velicer & Prochaska, 1997) and the Social Learning Theory (see Bandura, 1997). The TTM of changes in health behaviors suggests that specific needs must be met when individuals are at certain points in their life. Interventions and programs must be developed to meet the needs of the individual at the point they are currently located (i.e., one TTM breakdown consists of precontemplation, contemplation, subaction, action, and maintenance stages). The TTM will be used to present healthy lifestyle adoption behaviors to students and be used to convey the importance of developing healthy lifestyles. It is expected that Hispanic youth will be identified in each stage of the TTM, with the greater number in the lower levels.

One of the main components of Project PATHS is *Salud para su Corazón*. *Salud para su Corazón* is a communication and health behavior, theory-driven approach that is guided by principles of social marketing including audience segmentation and research, stages of change and by theories of attitude and behavior change including social learning, self efficacy, and planned behavior. We will incorporate these behavior change strategies in an ecological perspective that takes into consideration interventions at the individual, family and community levels. Finally, *Salud para su Corazón* is guided by principles of social action research (Alcalay et al., 1999). The knowledge gained from participation in *Salud para su Corazón* is necessary, but alone may not be sufficient, to change health behavior (Rudd & Glanz, 1990). We hope that the knowledge gained from *Salud para su Corazón* will pique the interest of many students to join the Health/Science Professions Club. The experiences gained from the field trips, lectures, the planning and delivery of a *Salud para su Corazón* community outreach program, and the dissemination of materials to peers, siblings, parents/guardians and others will help lead to the desired behavior changes (i.e., lifestyle modifications and the desire to pursue health/science based careers).

Unmet Needs

The small percentages of Hispanic students who enter the health/science professions, the growing Hispanic population in Texas and throughout the United States, coupled with the health risk factors found in Hispanics indicates the need for Hispanic health/science professionals is great. Cognitive understanding of the relationship between lifestyle behaviors and morbidity and mortality can help students see the important career “paths” they may take. Clearly, Hispanics need education, counseling, mentoring, experiences, and role models if they are to enroll in health/science related professional majors and/or schools. Project PATHS is designed to meet these needs while also directly influencing the lifestyle health behaviors of students, their parents/guardians, and the community. Nelson (1985) suggested that higher levels of community acceptance and utilization of health programs is influenced by ethnicity. Stoddard, Back, and Brotherton (2000) reported that the pediatrician-to-child population ratio in Hispanics (16.9 per 100,000 children) is currently about 1/3 of that for Whites (47.8 per 100,000 children). This ratio is projected to decline to 9.2 by the year 2025. One report found that minority patients are more likely to have a minority as their physician (Gray & Stoddard, 1997). This is most likely in the Hispanic population where Hispanics are 19 times more likely to report having a Hispanic physician as their health care provider than are non-minorities. They conclude that minorities are much more likely to visit minority physicians (Gray & Stoddard, 1997). Project PATHS is designed to pique high school students’ interest in health/science training and in health/science careers. This increased interest could ultimately impact health care program utilization.

Advantages and Limitations of this Model

As mentioned previously, we believe the multidimensional nature of Project PATHS, involving the students, health/science organizations, the school, parents and the community, is the main advantage of this

model. Students will be exposed to educational activities and materials that help to directly influence their personal health behaviors. *Salud para su Corazón* engages students in fun, healthy activities and relates these activities to health/science professions. These educational materials are expected to pique the students' interests in healthy lifestyle behaviors that could translate into their being interested in influencing the health status of others, such as friends and family members. Another advantage of this method of influencing career choices in Hispanic students is that it provides significant role models in health/science professions who reflect their ethnic ancestry. Lastly, they will see that they could ultimately influence even larger numbers of people if they became a health/science professional.

We believe that delivery of the program will not meet major obstacles. Cooperative agreements that have been arranged (see Letters of Support in Appendix) indicate that numerous health/science profession agencies are willing to participate in Project PATHS.

There are two major expected outcomes to the proposed work. We believe that we will be able to influence personal health behaviors through educational and motivational healthy lifestyle intervention. The second major outcome is the career choice made by the student participants. We believe that we can encourage students to consider health/science professional careers through exposure to professional information and direct contact with health/science professionals. We expect this will lead to a greater number of students considering health/science careers and enrolling in university and college majors that prepare them for such careers. Perhaps the major limitation to be encountered is the academic preparation and the financial burden encountered when applying for college. The students will obviously need to meet the academic requirements for entry into college and have the financial resources to actually matriculate and complete a health/science profession oriented major. We will work with school guidance counselors in an attempt to alleviate any issues related to academic or financial deficiencies that would preclude students from continuing their education.

Potential for Widespread Dissemination and Use

In 2001-2002, NDHS had 1702 students enrolled. The freshman class at NDHS consisted of approximately 700 students (75% Hispanic). Upon successful completion of Project PATHS, the intent is to utilize dissemination mechanisms that will result in Project PATHS being delivered to additional Dallas Independent School District (ISD) and Fort Worth ISD schools. There are currently 158,255 students enrolled in Dallas ISD with nearly 40,000 in grades 9-12; 55% Hispanic; 36% African American; 8% White; 1% Asian. Fort Worth ISD consists of 78,657 students with nearly 20,000 students in grades 9-12; 43% Hispanic; 32% African American; 23% White; 2% Asian. Beyond the two local school districts, the Hispanic high school population in Texas is estimated to be 523,594 based on the 2000 U.S. Census. It is projected that statewide, over 870,000 Hispanic households with children less than age 18 could be ultimately impacted by this program.

C. Preliminary Studies

Project PATH: A Pilot Study for PATHS

Currently, Project PATH (Participation and Training in Health) a pilot study for the proposed effort (PATHS) is underway. Project PATH, funded through August 2003 by a grant from the Texas Higher Education Coordinating Board; will implement lessons from *Salud para su Corazón* in the Life Skills (fall) and Health (spring) classes, required for all 9th graders and start a Health Promotions Club. Club members and their families will be able to take field trips and listen to presentations related to various health/science topics. As part of Project PATH, we have hired a bilingual Project Coordinator, Eva Pena, 3 bilingual teacher assistants, and a research assistant to disseminate the program materials and work with NDHS faculty. All are students at UNT or the UNTHSC.

One of the main components of Project PATH is the implementation of *Salud para su Corazón* materials. North Texas *Salud para su Corazón* (http://www.nhlbi.nih.gov/health/prof/heart/latino/latin_pg.htm) is an outreach initiative. This program utilizes culturally appropriate health promotion strategies to increase awareness and knowledge about heart disease prevention and to promote heart-healthy lifestyles in Latino

populations (Alcalay et al., 1999). This program has been effectively disseminated in the Latino community of Washington, DC (Balcazar et al., 2001). Through this program several partnerships (Health Alliances and Networks) have been developed to eliminate disparities in cardiovascular health in the Hispanic community of the area.

The North Texas *Salud para su Corazón* outreach initiative is using several educational materials and programmatic activities that will be used in Project PATH. These include: 1) *De Corazón a Corazón* (From Heart to Heart) – A Bilingual Group Discussion Guide; 2) educational videos including mini-telenovelas (novella format); 3) fotonovela and workbook, *Mas Vale Prevenir Que Lamenta* (An Ounce of Prevention); and 4) *Tu Corazón, Tu Vida* (Your Heart, Your Life) Peer Health Education Curriculum. This user-friendly curriculum provides an in-depth and user-friendly teaching tool to promote heart health and family wellness. The curriculum includes nine fun and educational sessions with hands-on demonstrations, videos, games and role-playing activities. This program is based on a participatory empowerment approach that emphasizes cultural competence, consciousness raising, skill building, problem solving, and social support. The Project PATH staff adapted this curriculum to work with students and their families. The curriculum includes nine educational lessons:

- 1) Are you at risk for heart disease?
- 2) Be more physically active.
- 3) What you need to know about high blood pressure, salt and sodium.
- 4) Eat less fat, saturated fat and cholesterol.
- 5) Maintain a healthy weight.
- 6) Make heart-healthy eating a family affair.
- 7) Eat in a heart-healthy way-even when time or money is tight.
- 8) Enjoy living smoke free.
- 9) Review and graduate.

Hispanic and minority youth in the target school are the focus of Project PATHS. One of the goals is the transfer of these educational materials and activities from the youth to their parents and communities. The PATH staff has modified the *Salud para su Corazón* curriculum making it more appropriate for high school students. Specific modifications to the curriculum include:

- 1) Adding teenage friendly pictures to the handouts and transparencies so they can appeal to the students more.
- 2) Adding an optional hands-on activity that involves students checking each other's blood pressures with Lesson 3.
- 3) Adding growth chart transparencies with Body Mass Index percentiles for ages up to 20 years old for Lesson 5.
- 4) Including a video that targets teenagers and the dangers of smoking in Lesson 8.
- 5) Adding sections to Lesson 8 on peer pressure and a role-playing activity that involved the students practicing saying no to the peer pressures of smoking.

The workbook, *Mas Vale Prevenir Que Lamentar* (An Ounce of Prevention), which covers modules 2, 3, 4, 5, and 8, will also be integrated as part of student activities. These educational activities will be used as tools in lessons based on *Salud para su Corazón*. We hope to use initial reviews and evaluations from this program to make modifications to the curriculum for use in PATHS and enable us to expand the program to include students beyond their 9th grade year.

Finally, our staff has met with and started coordinating activities with the Life Skills/Health teachers. We helped organize and participated in the 2002-2003 Freshman Teacher Training for 9th grade teachers at

NDHS. This training included the presentation of modified *Salud para su Corazón* materials. In addition, 9th grade teachers teaching other subjects (English, math, science, etc.) were instructed on how to reinforce the knowledge gained from *Salud para su Corazón* materials. Example of this is having the math teachers have students calculate BMI from height and weight measurements and total caloric intake from food labels. We received extremely positive feedback from the training evaluations. Representative teacher comments about the benefits students will receive from our program included “Learning beneficial skills and knowledge for health choices” and “Better lives, healthier lives, and the option to choose these because they have the information.” The Life Skills/Health teachers began implementing Project PATH in September 2002. Teachers and administrators have been extremely supportive of the dissemination of the program materials as well as survey administration conducted during their classes.

Previous Programming: The North Texas *Salud para su Corazón* Outreach Initiative

The North Texas *Salud para su Corazón* Outreach Initiative is one of only six CVD Enhanced Dissemination and Utilization Centers (EDUCS) in the nation. EDUCS are funded by the National Institutes of Health (NIH) - National Heart, Lung and Blood Institute (NHLBI) and are located in communities with CVD and stroke rates that exceed national averages. The North Texas *Salud para su Corazón* project, based at the UNTHSC School of Public Health, was selected as one of these centers. It is one of the primary disseminators of the NHLBI’s science-based information on CVD risk factors and effective strategies for promoting heart-healthy behaviors in the Hispanic communities of Fort Worth and Dallas. Health promotion strategies include lay health educators, neighborhood and community-wide activities, family-based interventions, and individual and family action plans. The North Texas project is utilizing the *Salud para su Corazón* model initiated in 1994 by the NHLBI as a comprehensive educational program committed to increasing knowledge and practice of heart healthy behaviors in Latino communities (Alcalay et al., 1999).

Previous Research

Dallas Area

Data from the National Center for Health Statistics indicate that Mexican American female adults and children of both genders have higher rates of overweight and obesity (NCHS, 2000) than the comparative total populations. Weiller, Jackson, and Meyer (1994) compared the passing rates in Dallas area Hispanic children for the FITNESSGRAM’s BMI health-related criterion referenced standards with the passing rates reported in the National Children and Youth Fitness Study (NCYFS; Ross & Gilbert, 1985; Looney & Plowman, 1990). The results indicated that passing rates for Dallas area Hispanic children were 8% lower for males and 12% lower for females when compared to NCYFS results. These data indicated that Dallas area Hispanic children suffer the same body composition and obesity problems noted in national data. This is especially important because specific health-related criterion referenced standards were used in the analyses. It is also important because overweight and obesity are identified as the second Leading Health Indicator in Healthy People 2010 (USDHHS, 2000).

North Dallas High School (NDHS)

We conducted a survey with 432 students at NDHS. Of the 432 adolescents surveyed, 333 (or 77%) were Hispanic. The survey examined knowledge about and interest in a wide range of health/science professions, and physical activity patterns, diet and nutrition, and tobacco use based on questions from the Youth Risk Factor Surveillance System. As reported earlier in the narrative, large percentages of the Hispanic adolescents reported no knowledge (15% to 76%, $M = 41%$) about health/science professions and larger percentages had no interest (52% to 87%, $M = 74%$) in those professions. In our pilot data, 64% of the Hispanic students reported being vigorously physically active three or more days per week. This finding is very consistent with the finding from the 1999 Youth Risk Factor Surveillance System report of 61% of Hispanics in high school being vigorously physically active three or more days per week. Healthy People 2010 established

65% as the baseline for the percentage of adolescents who are vigorously physically active for three or more days per week with a target of 85% for 2010. The Hispanic students in our target school appear to be quite consistent with national population of Hispanic adolescence on the first “Leading Health Indicator” of Healthy People 2010, physical activity.

Partnerships and Programming with Public Schools

Since 1982, the UNTHSC has established a tradition of supporting programs to increase the numbers of underrepresented and disadvantaged students entering careers in the biomedical and health sciences. Indeed, UNTHSC has developed a Coordinated Plan to increase diversity among the students of its various degree programs. In 1994 an Office of Multicultural Affairs was established to encourage the development of a diverse student population and to promote a friendly learning environment for all students. Subsequently, the Graduate School of Biomedical Sciences at UNTHSC created an Office of Outreach to coordinate its funded and non-funded programs designed to accomplish these goals.

Under the leadership of Dr. Robert Kamen, the Office of Outreach at the UNTHSC has received several awards in recognition of the success for increasing diversity. In 1996, most notable was the 2000 designation as an NIH-affiliate Minority Access, Inc., “Role Model Institution”, and the 2001 National Science Foundation “Presidential Award for Excellence in Science, Mathematics and Engineering Mentoring” (PAESMEM) which included a \$10,000 grant to support further mentoring activities. As a result of its efforts, UNTHSC has been recognized as the leading Health Science Center in Texas in minority graduate enrollment. There are two programs in particular that we are proposing to become involved with Project PATHS.

- 1) The “Adopt-a-School” program in which a UNTHSC staff or faculty member acts as a program coordinator, a graduate school student association that focuses its service activities on the selected target school, NDHS. UNTHSC students and faculty will travel to the school to offer classes and demonstrations in the biomedical sciences. NDHS students will serve preceptorships in the labs and clinics of the Health Science Center during both the academic year and summer.
- 2) UNTHSC’s Project SCORE (Schools’ Cooperative Opportunities for Resources and Education) is designed to train and support biomedical science graduate students as resources for high school biology students and teachers. With this program the NDHS students will be exposed to enthusiastic young scientists with experience, knowledge of and special interests in new areas of science and technology, and who will provide role models for the students to emulate.

The Department of Kinesiology, Health Promotion and Recreation (KHPR) at the University of North Texas has been involved in cooperative efforts with Denton Independent School District (Denton ISD) and NDHS of the Dallas Independent School District. The effort with the Denton ISD was initiated in 1998 and involved Denton ISD students and faculty and faculty from the UNT, Department of KHPR. Co-Investigator on Project PATHS, Dr. James R. Morrow, Jr., has been a Co-Principal Investigator on the Denton ISD project since its inception. It has provided learning, training, teaching, and research experiences for high school students, college students, high school coaches, and university faculty. This effort has been very successful to both partners and annually reviewed and renewed.

Current partnerships with NDHS include the UNT Project SCORE (Self-responsibility, Commitment, Optimism, Respect and Excellence), an interaction that combines the Center for Sports Psychology and Performance Excellence and is affiliated with the Departments of KHPR and Psychology faculty and students. This partnership has existed four years and has been directed at improving the academic and athletic performance of students at NDHS. Project PATHS Co-Investigator (Martin) was instrumental in the development and conduction of Project SCORE. The activities of the partnership have been primarily directed to increase the number of Hispanic students who are involved. Preliminary data suggest that the number of Hispanic students participating in the project has increased yearly. Additionally, the retention rate of students

involved in the Project SCORE is higher than the general school population. Thus, UNT Project SCORE has now been integrated into the Life Skills (i.e., Career Connections) curriculum for all 9th grade students in the fall term. Project Gaining Early Awareness and Readiness for Undergraduate Programs (GEARUP) is a U.S. Department of Education funded program that provides tutoring, mentoring, computer training, after-school programs in math and science, life/study skills, and reading and writing remediation. The main foci are increasing student expectations, academic performance, and preparing students to attain a college education. The program is directed through the College of Education at UNT. The Department of KHPR is administratively located in that College. The program is in year four of a five-year funding cycle. The present project will enhance GEARUP by adding a health and physical development component to student achievement and providing specific objectives for achievement, education, and training that lead to careers in the health sciences.

The continuing review and renewal of these public school and university partnerships clearly demonstrate that the cooperative relations between NDHS and project staff have been established and successful. The support and implementation of Project PATHS will take place in an established, cooperative environment that should contribute to successful accomplishment of program goals and objectives.

Perhaps most related to Project PATHS is Project PATH, a twenty-month project funded by the Texas Higher Education Coordinating Board (THECB). Project PATH serves as pilot work and validation of the researchers' ability to work collaboratively within the target school, its students, faculty, and administration. Project PATH is currently in its ninth month of support. The primary goal of Project PATH is to influence Leading Health Indicators in 9th grade students. We have been successful in training teachers and working within the school district to accomplish this aim. Initial data collection was conducted in September 2002. Follow-up data will be collected subsequent to the yearlong intervention.

Program Leadership Experience

Project PATHS has assembled a program staff with a variety of experiences in health/science research and programming and interactions with public schools to successfully accomplish the project goals. These experiences include relevant research, instruction, and interaction with the target population students and partnership programs with public schools and communities with the population demographics to be used in the project.

Project Staff

The project team assembled for Project PATHS is diverse in education, training, experience, and culture; exactly the diversity needed to accomplish the program goals and objectives.

Dr. Allen W. Jackson is a Regents Professor at UNT. He is a senior researcher and educator in the areas of health and physical activity. His research background includes work with diverse populations. He has developed an Internet based course used in University instruction dealing with physical activity and chronic diseases.

Dr. Hector Balcazar is a Professor in the School of Public Health, UNTHSC. He is chair of the Department of Social and Behavioral Sciences in the School of Public Health. He is a recognized expert and leader in the field of Hispanic health promotion. He was a principal partner in the development of "*Salud para su Corazón*" model in 1994 and is currently the Principal Investigator for the North Texas *Salud para su Corazón* Outreach Initiative funded by NHLBI-NIH (2001-2004), which is a primary educational and instructional tool of Project PATHS.

Dr. Francisco Soto Mas is an Assistant Professor, School of Public Health, UNTHSC. He is a physician and public health/science professional with vast experience in physical activity and health promotion in Hispanic populations.

Dr. Scott B. Martin is an Assistant Professor at UNT. Dr. Martin has been involved for four years in the cooperative partnership between UNT and NDHS. His expertise is in physical activity and behavior change.

Dr. Fred Fridinger is an Associate Professor in the School of Public Health, UNTHSC. Prior to joining the Health Science Center, he had been with the U.S. Centers for Disease Control and Prevention, in Atlanta, GA for nine years. His primary role was in target audience market research and communication of public health messages.

Dr. Shannon J. FitzGerald, Post-Doctoral Fellow, UNT and The Cooper Institute, is a specialist in epidemiology and health behavior research.

Dr. James R. Morrow, Jr., Regents Professor and Director of the College of Education Center for Interdisciplinary Research and Analysis, UNT, is an expert in measurement and evaluation of health, physical activity, and physical fitness outcomes and behaviors. He has conducted collaborative work with local school districts for the past three years as well as statewide and nationwide research on health risk factors and behaviors.

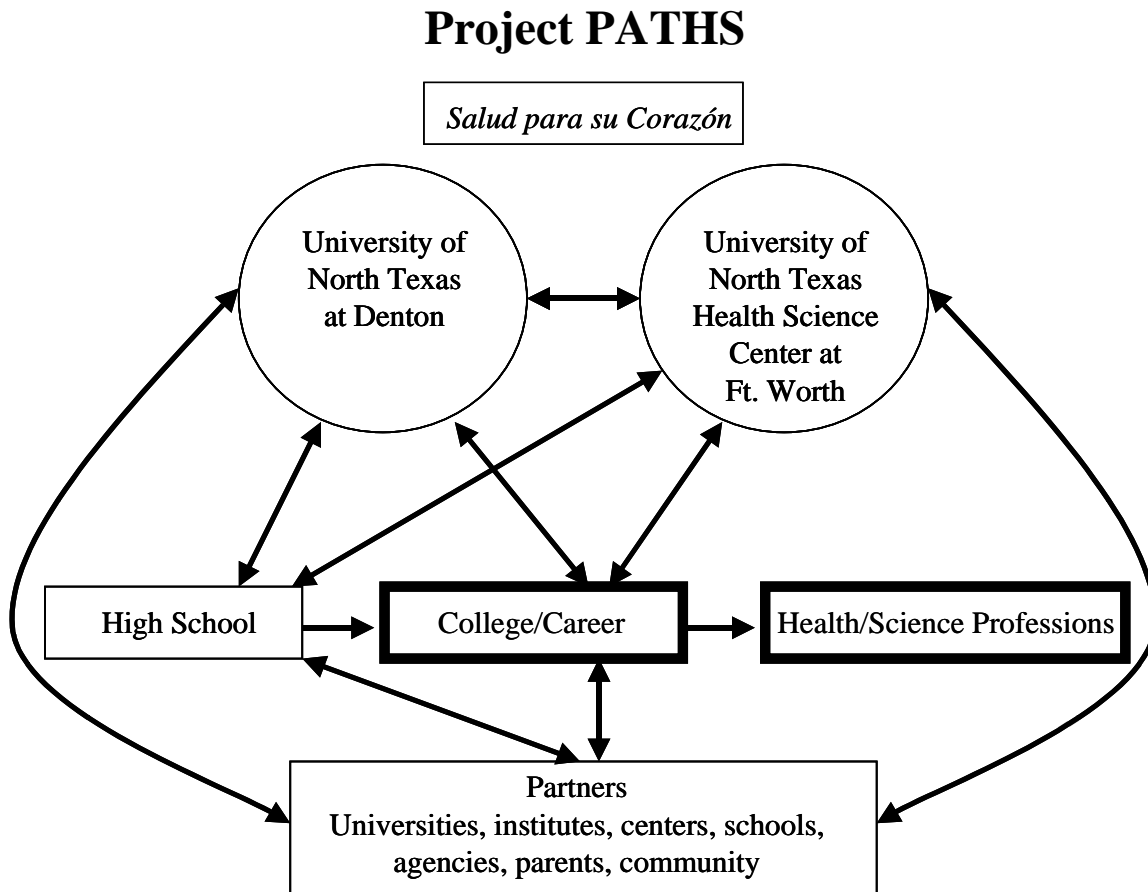
All of the aforementioned researchers are collaborating on Project PATH, a pilot investigation related to Project PATHS. Project PATH, funded by the THECB, demonstrates the ability of these collaborators to integrate *Salud para su Corazón* into the curriculum.

Dr. Robert Kaman is an Associate Professor with dual appointments in the Graduate School of Biomedical Sciences and the School of Public Health, UNTHSC. He serves as Director of the Office of Outreach and Assistant Dean in the Graduate School of Biomedical Sciences, and has almost ten years' experience in recruiting and training underrepresented, disadvantaged and first generation college students. He directs over \$4 million in federal agency training grants. Dr. Kaman has developed the Adopt-a-School program at the K-12 level into an award-winning activity at the health science center.

D. Proposed Plan

For this quasi-experimental study, NDHS will receive Project PATHS. Students will receive lessons from *Salud para su Corazón* as part of their 9th grade curriculum. They will also have the opportunity to participate in the Health/Science Professions Club, which will enable them to take field trips and engage in presentations relating to various health/science topics. During the 11th grade year, club members will organize and participate in a community outreach program for their families and the local community. This model is unique in that it will bring together groups and individuals from various backgrounds to assist in the health/science education process and to encourage positive behavior change. Molina High School, the comparison school, has an ethnic and socio-economic status very similar to NDHS. The student will serve as the unit of analysis in this study. Students at Molina High School will constitute the comparison site in order to establish the effects of the intervention on student's intentions and behavior. Participants in this site will not receive any intervention, however they will be offered a variety of educational materials from *Salud para su Corazón* and health/science professional career information once the outcome data are collected.

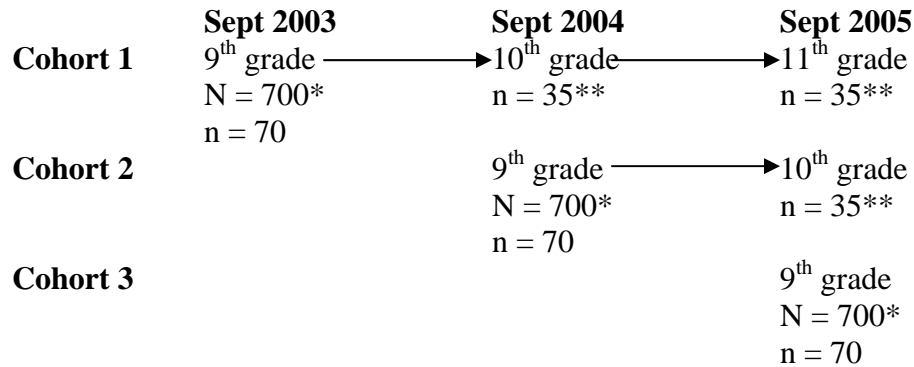
The proposed plan includes the three main components of the Social Learning Theory (see Educational Approach/Strategy to Influence Student Lives section and Figure 1). The interactions among the various partnerships created through Project PATHS are shown in Figure 2.

Figure 2. Project PATHS Partnerships

Number of Students, Faculty, and Community Members Impacted

In the 2001-2002 academic year, the target school, NDHS had a total enrollment of 1702. Hispanics comprised 75% of the students at NDHS. In the first implementation year of PATHS, based on the 9th grade enrollment at NDHS approximately 700 students and their families would be exposed to the PATHS health promotion activities. In the three years of implementation of Project PATHS approximately 2100 students and their families would be exposed to the health promotion activities of Project PATHS (see Figure 3). While Project PATHS is directed toward Hispanic students and their families, students of other ethnicities and their families will not be excluded from program activities, which will further increase the number of students and their families involved in the program activities.

In the three years of implementation, the development and evolution of a Health/Science Professions Club at NDHS will provide over 200 students interested in education for careers in the health/sciences (i.e., 10% of 9th graders or 70 students will join initially). With attrition rates between 9th and 10th grade it is expected that approximately 35 students per year will continue with the Health/Science Professions Club in 10th and 11th grades (see Figure 3). Only 12% of the teachers at NDHS are Hispanic. This underrepresentation is indirect evidence that the students at NDHS and other schools with a similar ethnic makeup (such as Molina High School) need role models and program activities to provide interest in and motivation for appropriate education for careers in the health sciences. This underrepresentation relates to the Science Education Partnership Award that has generated the proposal for Project PATHS.

Figure 3. Year-by-Year Cohorts

* This reflects the total students exposed to Project PATHS through *Salud para su Corazón* educational materials. It is expected that 10% of these students (n = 70) will participate in the Health/Science Professions Club as 9th graders.

** Based on estimated attrition of 50%

Quality and Types of Educational Materials

Salud para su Corazón (Health for Your Heart), the Latino Community Cardiovascular Disease Prevention and Outreach Initiative from the NHLBI will serve as the curricular foundation for developing interest in health and healthy lifestyle in Project PATHS. This program, originally designed as a community-based program for Latino populations, has been slightly modified into a classroom-based program for high school freshmen. A description of the original program as well as examples of modifications was presented earlier (see p. 9). Students will also have the opportunity to interact with various health/science professionals.

Why the Project PATHS Model Was Chosen

According to many published studies, an ecological model such as the Social Learning Theory is a more effective approach for facilitating behavioral change (see Bandura, 1997). Additionally, the collaborative model proposed by PATHS will enable participants to engage in various field experiences and career opportunities that contribute to achievement of the Project's goals.

One important way to encourage high school students to consider furthering their education in fields of science, particularly health-related science, is through exposure to health promotion programs. Specifically, ninth graders and their families will have the opportunity to receive materials from the *Salud para su Corazón*. Students who decide to participate in the Health/Science Professions Club throughout their high school career will be engaged with various health/science professionals through presentations, field trips, and mentoring experiences. We feel that the multidimensional nature of Project PATHS, involving the students, health/science organizations, the school, parents and the community, makes this intervention an effective means to elicit behavior change in high school students.

Grade-by-Grade Activities for the First Cohort

Ninth Grade – This is the primary year during which the “healthy lifestyle skills” content, as described above, is delivered to the students (*Salud para su Corazón*). During the Life Skills and Health classes, both required for all 9th graders, students are introduced to essential healthy lifestyle skills and academic skills, including physical activity, nutrition, goal setting and developing self-responsibility, coping with stress and pressure, managing anger effectively, communication, etc. (see Appendix). The final curriculum will be set in

conjunction with NDHS Campus Instructional Leadership Team (CILT). The NDHS CILT team will work with the PATHS Project Coordinator during the summer to finalize the curriculum and ensure that the information (i.e., videos, Internet resources, manuals, and activities) is prepared for the beginning of the school semester in August.

Salud para su Corazón

Student Involvement. The focus of the ninth grade year will be to introduce all students to essential healthy lifestyle skills and information, establishing the expectations for conduct and behavior in school and life, and developing support, friendships, and good communication among this class of students. The instructor will introduce the topic, help the students see its relevance in all areas of life, develop an action plan for implementing it in their lives, and, where relevant, have them practice and experience the topic or skill in class. Because individuals learn in different ways, information will be taught with individual learning styles in mind and will emphasize active learning. The PATHS Program Coordinator and the 3 bilingual teacher assistants will be responsible for training the NDHS faculty who will instruct the classes, assisting in the delivery of healthy lifestyle skills material and getting evaluations and feedback from the students after each lesson. Data will be obtained at the beginning, middle and end of the ninth grade on levels of physical activity, health risk behaviors, interests and involvement in health career activities.

By adhering to specific behavioral standards of academic and personal conduct that are part of the program and attempting to learn more about healthy lifestyles, the 9th graders will earn special opportunities or prizes. Specifically, students will earn prizes if they:

- 1) Earn a passing grade (75% or higher) in all courses;
- 2) Have two or fewer disciplinary actions that require involvement with the principal or being sent to the main office;
- 3) Attend 95% of all classes; and
- 4) Do not get suspended or expelled from school.

They will be eligible for rewards each 6-week term. Rewards will include Students of the Month, trips to the University of North Texas to attend sporting or cultural events, etc. In the first four years of collaboration with NDHS, we had the support of several Dallas sport teams (e.g., the Mavericks, Burn, Rangers, and Stars) who donated different products for the students (e.g., autographed t-shirts and sporting event tickets). We will continue our efforts to locate businesses that are willing to donate products to the proposed project.

Family Involvement. Parents will initially be recruited at freshman orientation held prior to the start of school year. This year there were approximately 300 parents and students in attendance. We also will send home a flyer describing our program and sponsor a parent night, featuring a high-profile local athlete at the beginning of the school year.

Many of the lessons in *Salud para su Corazón* include take home activities that will involve family participation. Examples of the activities students will take home include:

- 1) Having family members complete the handout “More Information-Heart Disease Risk Factors You Can Do Something About” (Lesson 1). Students are also asked to bring back the responses from their family to review during the next class meeting.
- 2) Giving their family members the handout “Getting Started: Important Things to Know”, which provides information on what the students and their parents should know before they start being physically active (Lesson 2).
- 3) Giving their family members the handouts, “Tips To Eat Less Salt and Sodium”, “Use Herbs and Spices Instead of Salt” and “Caribbean Pink Beans” and the pamphlets, “Take Steps-Prevent High Blood Pressure” and “Cut Down on Salt and Sodium” (Lesson 3).

- 4) Calculating BMI for every member of the family and determining whether it falls in the “healthy” range and encouraging family members to adopt healthy lifestyle practices (Lesson 5).
- 5) Checking the food labels in their homes and completing handouts together with their family (Lesson 7). They are also asked to talk with friends and family about the nutritional value of the food they eat.
- 6) Sharing tips to quit smoking with their family and friends. They are given the handout “Kick the Smoking Habit” to take home (Lesson 8).

Health/Science Professions Club

Based on student and parent interest, the PATHS staff and CILT team will identify students who will be involved in a Health/Science Professions Club. Members of the club, along with their parents, will have the opportunity to attend field trips as part of their learning experience. Specific field trips planned for the first year include The Cooper Institute, the Department of KHPR at UNT, the School of Public Health at UNTHSC and Science Teacher Access to Resources at Southwestern (STARS) tour at Southwestern Medical Center (topics: Emergency Medicine and Orthopedic Surgery). These partnerships are described in more detail below under the “Outreach Partnerships” section. Health/Science Professions Club members will choose the name and organize club activities. It is expected that 70 or more students will join the Health/Science Professions Club in the 9th grade. Given attrition rates between 9th and 10th grade it is estimated that half of the members who start will continue in their 9th and 10th grade years. Therefore, at the end of the three-year program approximately 140 students should be involved in the Health/Science Professions Club. The PATHS Program Coordinator also will work closely with the school’s academic advising office to ensure that the students are being successful in their other classes.

Tenth Grade – During the Health/Science Professions Club, 10th grade students are reintroduced to the main healthy lifestyle skills taught during the ninth grade. There will be a focus on establishing academic and personal goals for the upcoming school year. The students and their parents (if available) would go on four field trips to health institutions or organizations (i.e., Department of Biochemistry at UNTHSC; STARS tours at Southwestern Medical Center [topics: tour of Parkland Memorial Hospital, general radiology and genetic research]; Department of Biology at UNT; and School of Physical Therapy, Texas Women’s University). We will identify health/science professionals and significant community members who, through their status as role models, will be guest speakers at the school. Science ambassadors from the STARS program will be invited to speak on various topics related to biomedical research and careers. Various student organizations from UNT and UNTHSC will send representatives to speak on their experiences on training to enter a health/science profession. We will use our own Network and Health Alliance from *Salud para su Corazón* North Texas. These professionals will be invited to speak with the students and share their wisdom about being successful in school and life. This Health Alliance already has county and private hospitals, community-based agencies, and county and city health departments participating. Exposure and partnerships, combined with the educational skills and strategies necessary to successfully complete educational experiences will influence lives. Throughout the year, students will keep a weekly journal of their experiences, thoughts, and feelings about what they are doing and what they are learning. Project PATHS staff will periodically review the journals and provide feedback to the students. In addition, the journal will act as a “health goal log” in which the students keep track of progress toward their goals.

Mentorship Program

Starting in the 10th grade Health/Science Professions Club members will participate in mentoring on two levels. First, they will serve as peer mentors for 9th grade students interested in health and science. Part of the mentoring experience at this level will involve giving presentations in classes throughout the school to share what they have learned from the lectures and field trips. An attempt will be made to match faculty and students

from UNT, UNTHSC, the McNair program, and the STARS program. This experience will involve periodic contact between the mentors and high school students to answer questions or give advice relating to health/science related matters.

Eleventh Grade – During the first month of the 11th grade school year, a review of the materials presented the previous two years will take place. Following the reintroduction, the focus of the Health/Science Professions Club will turn to “community outreach and involvement.” In other words, the focus of this year will be on learning about administering a *Salud para su Corazón* community outreach program. The PATHS Program Coordinator, Health and Physical Education instructors, and Health/Science Professions Club students will organize, lead and participate in a *Salud para su Corazón* community outreach project. As part of *Salud para su Corazón* a Hispanic Wellness Fair will be conducted at the end of the school year. Specific activities at the Wellness Fair will include blood pressure assessment, cooking demonstrations and guided discussions on various health topics. Students’ parents will be invited to attend all outreach activities. Through this health promotion project, the students develop important awareness and personal characteristics, such as becoming familiar with information resources, working together as a team, developing an action plan, setting and following through on a goal, learning to help others, etc.

Like the previous year (10th grade), the Health/Science Professions Club members and their parents (if available) will go on four field trips (i.e., School of Physical Therapy at Texas Women’s University; Texas College of Osteopathic Medicine at UNTHSC; STARS tours at University of Texas Southwestern Medical Center [topics: depression, histology, forensic sciences, cardiac rehabilitation and DNA fingerprinting]; and the Department of Chemistry at UNT). Presentations will be given from speakers from the STARS program, the Department of KHPR at UNT, student groups at UNTHSC and HISPA will come to give presentations and the mentoring program will continue at both levels.

Health/science profession workshops will be planned with the NDHS advising office (see Letters of Support in Appendix). The health/science profession workshops and job fair will ensure that topics related to health/science professions are relevant and that school personnel are involved with the students. The PATHS Program Coordinator will be responsible for working with school counselors to organize two special activity nights for students at NDHS. During the Fall term, the Program Coordinator and Health/Science Professions Club members will organize and sponsor a College Night where colleges and universities from the Dallas/Fort Worth area will be invited to set up a table and speak with the students about the programs at their schools. The College Night planned would coincide with the existing College Night. Our group would assist in recruiting representatives from health and science majors to be present on that night. Planning for the event will begin during August so it may be conducted by December. All students will be introduced to the topic of career/major planning during their classes and given the opportunity to set and work toward job/career-related goals. Although all students will be invited to attend, juniors will be the target audience. Health/Science Professions Club members will assist the College/University representatives at their booths. During the Spring term, Health/Science Professions Job Fair for the students at NDHS will be organized. The purpose of this job fair will be to bring employers to the school to talk with students about summer employment in health/science professions. Although many students work during the school year, many more seek employment during the summer months. Because many will be inexperienced at applying for a job, the fair will provide them with an opportunity to meet potential health/science related professional employers and learn more about what is expected of them when employed. In addition, during the fair, we will offer training and information on interviewing and submitting job applications.

Whether students plan on attending a four-year college/university, a community college, a technical/trade school, or obtaining a job, students will be encouraged to look beyond their senior year in high school and think about what they want to do with their lives. Through PATHS, the students will be given opportunities to learn more about themselves and their abilities so their career choices will be more congruent and likely to be more satisfying. At the end of the year, students will write a paper that summarizes their

Table 1. Timetable of Events for the First Cohort of Students.

Year	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul
2003-04 9th Grade	Student Assessment; Introduction to PATHS; Start Health/Science Professions Club	Lesson 1: Risk for Heart Disease	Lesson2: Be More Physically Active Field trip to the Cooper Institute	Lesson 3: High Blood Pressure, Salt, and Sodium	Student Assessment; Lesson 4: Eat Less Fat, Saturated Fat and Cholesterol Field trip to the School of Public Health, UNTHSC	Lesson 5: Maintain a Healthy Weight	Lesson 6: Heart-healthy Eating a Family Affair Field trip to UNT, Department of KHPR	Lesson 7: Eat in a Heart-healthy Way - Even When Time or Money is Tight	Lesson 8: Enjoy Living Smoke Free Field trip to Southwestern Medical School	Student Assessment; Lesson 9: Review and Graduate	Annual Meeting with Project Coordinator. Analyze Evaluation Data	
2004-05 10th Grade	Student Assessment	Field Trip to Dept or Biochemistry - UNTHSC	Presentation-STARS Ambassador	Field trip to School of Nursing at TWU	Student Assessment; Presentation-McNair Scholar	Field Trip to Southwestern Medical School	Presentation-SALSA Student Organization at UNTHSC	Field Trip to Department of Biological Sciences at UNT	Presentation-HISPA	Student Assessment	Annual Meeting with Project Coordinator. Analyze Evaluation Data	
2005-06 11th Grade	Student Assessment	Introduce Community Project Field trip to Department of Chemistry at UNT	Field Trip to School of Physical Therapy at TWU Planning of Community Outreach Program	Presentation-STARS Ambassador	Student Assessment; Presentation from UNT-Dept of KHPR College/ University Health Program Night	Field Trip to Texas College of Osteopathic Medicine-UNTHSC	Presentation from UNTHSC Student Organization Kick-off for Community Outreach Project	Field Trip to Southwestern Medical School	Presentation - HISPA Health Career - Job Fair Night	Student Assessment; Community Wellness Fair	Annual Meeting with Project Coordinator. Analyze Evaluation Data	

involvement in the *Salud para su Corazón* community outreach project, the impact the project had on the community, and how they personally changed as a result of being involved in Project PATHS.

This timetable (see Table 1) reflects the activities for the first cohort of students. As shown in Figure 3, three cohorts of NDHS students will receive Project PATHS. In 2004-2006, a second cohort will receive the 9th and 10th grade curricula and in 2005-2006, a third cohort will receive the 9th grade program.

Educational and Scientific Partnerships to be Developed

Primary Partnerships

UNT is the fourth largest University in the State of Texas with an enrollment over 30,000 students in nine colleges and schools. The UNT Departments of Biological Sciences, Chemistry and KHPR are collaborating on development and delivery of Project PATHS. The UNTHSC is located in Fort Worth and educates osteopathic physicians, biomedical scientists, public health/science professionals, physician assistants and other health/science professionals for careers in science, health care, teaching and research. Investigators from the KHPR Department at UNT and the School of Public Health at the UNTHSC are providing collaborative leadership for Project PATHS. UNT and UNTHSC have a special mission to meet the needs of individuals in the geographic areas, and to provide health care education and services that emphasize promotion of health and physical activity, prevention of disease and public health issues affecting society. The partnership between UNT, UNTHSC and NDHS will allow us to accomplish the Project PATHS goals and objectives.

The UNTHSC includes the following programs that will be contributing to PATHS. The Texas College of Osteopathic Medicine and the Graduate School of Biomedical Sciences. Additionally, the UNTHSC is involved with the following initiatives and groups: 1) Summer Multicultural Advanced Research Training (SMART); 2) Ronald E. McNair Post-baccalaureate Achievement Program; 3) The Latin American Medical Student Association (SALSA); 4) The School of Public Health Student Association; and 5) Hispanic Healthcare Professionals Association, Inc (HISPA).

Outreach Partnerships

Texas Woman's University (<http://www.twu.edu>). School of Physical Therapy and the College of Nursing educate individuals whose skills and knowledge meet the challenges of the rapidly changing health care system. Graduates meet the expanding need for health care services in North Texas, the state, region, and nation. The programs work collaboratively with the community to improve the quality of health care and enhance the scientific basis of professional practice (see Letter of Support in Appendix).

The Cooper Institute (<http://www.cooperinst.org>) is a nonprofit research organization that is dedicated to advancing the understanding of the relationship between living habits and health and to providing leadership in implementing these concepts to enhance the physical and emotional well being of individuals. The Cooper Institute is located on the 30-acre campus of the Cooper Aerobics Center, in Dallas, TX. The Cooper Institute conducts research in epidemiology, exercise physiology, behavior change, children's health issues, obesity, nutrition, aging, and other health issues (see Letter of Support in Appendix).

STARS (<http://www.swmed.edu/stars/>) was initiated by Southwestern Medical Center in 1991 to improve the quality of science education in North Central Texas. STARS now includes over 20 separate programs and projects, which are available, free of charge, to teacher and students in the state of Texas. Available programs include student tours which are offered to students and teachers at the University of Texas Southwestern campus and affiliated hospitals to learn about scientific research and biomedical careers and science ambassadors who are volunteers that travel to area schools to speak on various topics related to biomedical research and careers (see Letter of Support in Appendix).

Key Personnel and Administrative Plan

As previously stated, the project team assembled for PATHS is diverse in education, training, experience, and culture. These individuals bring with them a broad range of knowledge and experiences that

will help make Project PATHS successful. Key personnel and administrative responsibilities are described below.

Dr. Allen W. Jackson, Principal Investigator, will provide overall leadership for the entire project. He has published widely in the area of health, physical activity, and fitness.

Dr. Hector Balcazar, Principal Investigator-UNTHSC, will provide the guidance for culturally appropriate administration of the project. He is leading the North Texas *Salud para su Corazón* project in Fort Worth and Dallas that will be used in Project PATHS delivery. He will be responsible for supervising the integration of *Salud para su Corazón* and Project PATHS.

Dr. Francisco Soto Mas, Co-Investigator, will aid in the guidance for culturally appropriate administration of the project.

Dr. Scott B. Martin, Co-Investigator, will ensure the project is effectively integrated into the educational mission of NDHS.

Dr. Fred Fridinger, Co-Investigator, will lead the project in efforts to provide effective media outreach and health messages for the communities associated with NDHS.

Dr. Shannon J. FitzGerald, Co-Investigator, will serve as Project Director and oversee the supervision, recruitment, and retention of project staff including the on-site PATHS Program Coordinator. In addition, her role at The Cooper Institute, a primary demonstration partner, will allow for an effective program interaction at that site.

Dr. James R. Morrow, Jr., Co-Investigator, will lead in the measurement and evaluation of project objectives.

Dr. Robert Kamen, Co-Investigator, will assist in coordinating outreach educational opportunities for the high school students at UNTHSC.

Ms. Eva Pena, Project PATHS Program Coordinator, will directly supervise the day-to-day experiences of the project. She will be responsible for all on site phases and delivery of the project's activities, which will include working directly with the faculty, staff, students, parents, and administration at NDHS. She has and will continue to be trained in public health promotion as she works toward completing her Master of Science degree at UNTHSC. She is fluent in Spanish and familiar with the Hispanic culture.

Currently, three bilingual teacher assistants and one research assistant are involved in Project PATH (pilot study for Project PATHS). They are students from UNT and the UNTHSC and will continue their roles initiated in Project PATH in supporting the Program Coordinator. Tasks include activities such as: 1) leading focus groups with students, parents, faculty, and students; 2) presenting *Salud* materials to the Life Skills and Health classes; 3) making health/science career related presentations; and 4) meeting with individual students and parents to address specific issues and concerns.

Evaluation Component

Process, Impact, and Outcome: Evaluation of Project PATHS

Project PATHS is designed to impact underserved populations, particularly Hispanic students. The specific goals of project PATHS are: 1) preparing students to choose health/science careers and increasing the number of Hispanic students who view health/science-based professions as viable career opportunities; 2) changing the lifestyle health behaviors of high school students, specifically physical activity, overweight and obesity and tobacco use, the three Leading Health Indicators from Healthy People 2010; and 3) to determine the effectiveness of Project PATHS, a quasi-experimental study will be conducted between NDHS and Molina High School in three cohorts of students.

To assess and evaluate educational career choices and health behaviors outcomes, a two (schools, NDHS/Molina High School) by two (beginning of school year/end of school year) design will be used. Molina High School is a 9th through 12th grade high school that will serve as a comparison school. Molina High School provides an excellent comparison site for the following reasons:

- 1) It is in close geographical proximity to NDHS.
- 2) It is in the same school district as NDHS.
- 3) It possesses a very similar ethnic and socio-economic status to NDHS.
- 4) The academic performances of Molina High School students are very similar to that of NDHS students as reported by the Texas Education Agency.

Process Evaluation

Written evaluations determining student, parent, and faculty satisfaction with project activities will be collected at the end of the calendar year and the end of the school year. Focus group meetings with students, parents, and faculty will be conducted to obtain feedback on delivered activities and to discuss activity recommendations. These assessments and focus group meetings will also occur at the end of the calendar year and the end of the school year. This will allow feedback to be used to monitor and adjust the activities if assessments and focus meetings indicate the desired goals are not likely to be achieved.

In June of each year, a formal meeting of the entire Project PATHS staff will be held. The PATHS Program Coordinator, under the supervision of the Project Director, will prepare and make a presentation to the entire staff. This presentation will summarize the year's activities and evaluation data and feedback. This information will be formulated into the annual report for the National Institutes of Health and the teachers and administration of NDHS and Molina High School. This formal meeting will also set the agenda for the coming year in terms of any program adjustments or changes that may be needed. These adjustments or changes will be derived from the feedback, data collection, and data analyses obtained during the school year. A lay report of the findings in English and Spanish will be prepared and disseminated to parents and students. Additionally a tracking system will be developed to maintain a continuous monitoring of activities, student participation and enrollment. Evaluation tools will be piloted prior to implementation.

Impact Evaluation

The purpose of the impact evaluation is to assess intermediate changes related to 1) knowledge of health careers and opportunities, 2) knowledge of available sources of information and sources of support for entering health/science careers, and 3) attitude toward college education and health/science professions. One of the aims of PATHS is to provide a positive/supportive environment for college education. This includes the school environment and the family environment. Assessments will be conducted at the end of every academic year among students, teachers, school administrators and parents at both the intervention and comparison sites.

A number of evaluation tools and processes will be developed for conducting the proposed impact evaluation. Written surveys will be developed to assess changes in participants' knowledge of the different health/science careers, the physical location of colleges and universities offering health/science programs, the sources of information for identified institutions (websites, contacts names, outreach programs, etc.) and other information that may facilitate the process of entering in a health/science career. Additionally, several focus groups will be conducted with a small number of students to gather additional information related to these issues.

Environmental changes at the school and family levels will be evaluated through interviews, surveys and observations. Teachers and administrators will be interviewed to assess their level of awareness related to health/science career opportunities. Observations will be conducted at the intervention site to assess availability of information on health career opportunities (posters, brochures, distribution of materials, etc.).

Outcome evaluation

Outcome evaluation will be conducted at three levels: 1) college entrance exam; 2) interest in health/science careers; and 3) health risk behaviors.

Evaluation Tools

Ongoing evaluation of goals and objectives will be accomplished through a variety of activities. To assess the health and lifestyle behaviors, portions of The Youth Risk Factor Surveillance System, a national survey from the Centers for Disease Control and Prevention, will be administered (see Appendix). Students will have the option of having the questions in English or Spanish. They will be targeted at evaluating physical activity, overweight and obesity and tobacco use behaviors.

To evaluate student progression toward health/science careers, as well as interest in attending college, a variety of strategies will be used. As presented earlier, data have been collected on the knowledge about and interest in a variety of health/science professions with a written survey (see Appendix). Examples of health/science occupations include biochemist, physician and physical therapist. Questions to evaluate interest in college include: 1) "Do you plan to graduate from high school?"; 2) "Do you plan to go to a College or University?"; and 3) "Have you taken the SAT or ACT college entrance exams. Participation in the Health/Science Professions Club and its activities (meetings, health/science activities, field trips, etc.) will be monitored and recorded. Measures of academic achievement, including test scores, course grades, attendance, and attrition will be obtained through their academic records. Evaluation of the number of participants and those indicating an interest in pursuing a health/science professional career will be monitored throughout the program. If we retain 140 students in the Health/Science Professions Club, as we expect to do, this equates to roughly 10% of the students in each grade level which exceeds the percentage of Hispanic origin in higher education pursuing degrees related to health and science (National Center for Health Statistics, 2000; NSF, 2001).

All students will be tested in their Life Skills and Health or their homeroom classes at the beginning and end of the school year, for the three years of the study. With the student serving as the unit of analysis, factorial analysis of variance with repeated measures, dependent t-tests, and Chi-square analysis will form the statistical analyses with Bonferroni correction to minimize the Type I error rate. Even with restricted alpha levels at .005, statistical power will exceed .80 for moderate effect sizes of .5 for the criterion variables because of the large numbers of students participating in data collection.

Limitation

The principal limitation facing Project PATHS is the drop out or attrition rate of students in urban schools similar to NDHS. We examined the enrollment pattern of NDHS as reported by the Texas Education Agency. The data indicate a student attrition rate of 27% between 9th and 10th grades and a 39% rate between 10th and 11th grades. This student attrition rate ceases between 11th and 12th grades where enrollment increases by 6%. These high attrition rates are due in part to families relocating and the burden placed on the student to get a job in order to assist the family financially. As previously mentioned, our objective for student involvement in the Health/Science Professions Club is at least 140 students, which is approximately 10 percent of the Hispanic students at NDHS. Figure 3 illustrates our student recruitment plan that should achieve that goal while considering the historical attrition rate at NDHS. We feel that our team's involvement, specifically that of the research assistants who are positive role models, at NDHS will have a positive impact of reducing attrition by maintaining student involvement and continually recruiting new students. In addition, all speakers will discuss the importance of an education and staying in school, as well as their health/science-related topic. We will continue to address the attrition issue and how to minimize it.

Project Summary

Project Participation And Training in Health Sciences (PATHS) is designed to utilize culturally appropriate health/science materials, methods, and experiences to influence the health behaviors and career choices of Hispanic students. The project is a collaborative effort between the UNT, Department of KHPR and the School of Public Health, UNTHSC. An interdisciplinary team of scholars, educators, program developers, and content experts will develop partnerships between the two University units, schools within the Dallas Independent School District, and community and university science and health agencies/units throughout the

Dallas/Fort Worth Metroplex. The primary mechanism for delivery will be through direct contact with students and their parents/guardians during school-based activities that are then carried throughout the community. The goals and objectives of Project PATHS are directly related to the key initiatives set forth in Healthy People 2010 related to health behaviors, a reduction in health disparities, and an increase in the number of Hispanic students entering the health/science professions. The Investigators have conducted a great deal of preliminary work related to Project PATHS. Willingness to participate in the partnership arrangements has been demonstrated (see Letters of Support in Appendix). Project PATHS' goals and objectives, the methods used, and the populations addressed are directly related to the SEPA call for proposals.

E. Human Subjects**Protection of Human Subjects**

Approval was received from the University of North Texas Institutional Review Board (IRB) for last year's submission. The IRB will need to be modified and resubmitted in October.

1. Risks to the Subjects**Subjects**

The students for the proposed study attend North Dallas High School (NDHS) and Molina High School (MHS), both in the Dallas Independent School District. NDHS currently enrolls 1874 students in grades 9-12, approximate ages of the students range from 14-19 years old and 75% are Hispanic. The freshman class at NDHS consists of approximately 700 students. Teachers at this school will have added a Project PATHS to the academic curriculum. MHS, a 9th through 12th grade high school with a socio-economic status very similar to NDHS, will serve as a control school. There is nothing remarkable about the health of the populations at these two schools. Students enrolled at NDHS and MHS students will be eligible to participate in the study. Given that NDHS is implementing PATHS, we felt that it was important to evaluate the success of their intervention compared to a control school that has not implemented the program. A sample of 200 9th grade students from MHS each year will serve as controls.

Materials

The criterion variables will be health risk factors as measured by the Behavioral Risk Factor Surveillance System (Spanish or English) from the Centers for Disease Control and Prevention (CDC) for adult family members. The Youth Risk Behavior Surveillance System will be used for students. Students will also be given a brief survey about knowledge and interests in health professions.

Potential Risks

Potential risks for responding to a questionnaire are minimal.

2. Adequacy of Protection Against RisksRecruitment and Informed Consent

MHS and NDHS students and their parents will be eligible for the health behaviors evaluation. The consent forms (one for parent and one for student) will be sent home with all ninth grade students for their parents to review. Parents and students (assuming at least 14 years old) will sign the consent forms if they are interested in participation. A Parents' Information Night will also be held at the beginning of each the school year to describe the evaluation process. At this meeting the study investigators will be available to answer any questions. Signed informed consents will be returned at this meeting or will be sent back to school.

Protection Against Risks

There is no risk involved in filling out questionnaires. When not in use, all hard copies of student and parent responses to the questionnaires and student identifiers will be kept in locked files in the office of the Project Coordinator. Identification numbers and results from student questionnaires are abstracted and entered into password protected computer storage for data analyses. Data will only be accessible to project staff.

3. Potential Benefits of the Proposed Research to the Subjects and Others

The two primary goals of the health promotion and science program at NDHS are to impact underserved populations through:

- 1) Increase the representation of Hispanics in the health/science professions; and
- 2) Promote health-related lifestyle changes.

If these goals can be reached they will positively affect two important issues facing minority communities. If PATHS is found to be effective, not only has it benefited those involved, but it also can be disseminated to others to positively impact their health status as well. These benefits outweigh the risks involved in filling out a questionnaire.

4. Importance of the Knowledge to be Gained

If our evaluation of the health promotion program at NDHS shows that teachers are successful in positively changing the health behaviors of students and parents and able to increase students' knowledge and interest in the health/science professions, then what we learn from this process will be of utmost importance and will far outweigh any risks involved in answering questionnaires.

Inclusion of Women

All students (female and male) of NDHS and MHS will be eligible for the study. In addition, all parents and guardians (women and men) of students are eligible. All students will be sent home with consent forms at the beginning of each school year (each August/September 2003-2006). Texas public schools are not allowed to provide data on the number of female students, therefore we do not know the exact number of female students available for recruitment.

Inclusion of Minorities

All students and their families will be eligible for the study. The ethnic/racial distribution of NDHS is as follows: 74.5% Hispanic or Latino, 13.5 % Black or African American, 9.1% Asian/Pacific Islander, 2.2% White and 0.6% American Indian. MHS has a similar ethnic/racial makeup.

Inclusion of Children

High school students are the target population for the proposed study. By the third year of the study all students in grades 9-11, approximate ages range from 14-17 years old, will be eligible. We feel that this age group is an ideal one to evaluate a school/family-based health promotion and science program, given the importance of adopting healthy lifestyle behaviors and developing an interest in future career decisions at this point and time in their lives. If Project PATHS does make a positive difference in young peoples' lives this positive impact could affect the rest of their lives.

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H. Consortium/Contractual Arrangements

The University of North Texas ([UNT] Department of Kinesiology, Health Promotion, and Recreation) and the University of North Texas Health Science Center ([UNTHSC] School of Public Health) have entered into a partnership to conduct Project PATHS. Investigators and key personnel are included from both Universities. See letter of support in the Appendix.

The UNT and UNTHSC are working in collaboration with the Dallas Independent School District (North Dallas High School). See letter of support from the NDHS Principal in the Appendix.

The UNT and UNTHSC have received letters from area allied health agencies and universities indicating a willingness to work on Project PATHS. Letters of support from UNT Department of Chemistry, UNT Department of Biological Sciences Texas Womans University (TWU) College of Nursing, TWU School of Physical Therapy, and The Cooper Institute are included in the Appendix.