AN EVALUATION OF THE HEALTH ROCKS! PROGRAM: IMPLICATIONS FOR MEASURING FUTURE PROGRAM IMPACT

by

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(Under the Direction of Chris Morgan)

ABSTRACT

Substance abuse among school aged individuals is associated with a number of problems including promiscuity, school attendance, academic success, and legal problems. The National 4-H Council and Georgia 4-H attempted to present a substance abuse educational program, called Health Rocks!, during 2010 to an audience primarily composed of middle school youth. Statistically significant differences were found in attitudes and knowledge level of these youth from a post curriculum exposure standpoint compared to pre curriculum exposure. Though the data analysis revealed significant increases, it was recommended that program developers modify the questionnaire by utilizing questions that call upon a more advanced level of knowledge to truly measure changes in participants as well as eliminate some of the potential for measurement error.

INDEX WORDS: substance abuse, education, evaluation, youth, curriculum, development

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CHAPTER ONE

INTRODUCTION

Effective evaluation is the key component of measuring both the efficacy and success of a program, and is typically overlooked, particularly with regard to the effective structure of an instrument designed to measure the program's outcomes or impacts (Cole, 2000; Roberts, Fournet, & Penland, 1995). Within substance abuse education programs there have been a variety of evaluation tools employed to try to garner the true impacts of the lessons upon the choices of program participants with regard to their attitudes toward the use of controlled substances, as well as assessing the likelihood that program participants will at some point use alcohol, tobacco, drugs, or engage in a negative behavior. Studies of substance abuse prevention or educational programs have tended to examine the relationship between exposure to program curriculum and tendency to use drugs after program completion, or have attempted to examine the mechanisms of why change occurred in the attitude of program participants toward substance usage throughout the course of the program itself (Stickle & Terranova, 2003). Research in the past regarding program effectiveness has produced mixed results, perhaps most famously concerning the Drug Abuse Resistance Education (DARE) program and the evaluation of the impacts upon participants after completion of the curriculum. Program evaluations have either tended to report changes in behavioral intent based on singular evaluations or in some cases attempted to use longitudinal studies of program participants to gauge a correlation between participation in a substance abuse program and later substance usage (Ennett, Tober, Ringwalt, & Flewelling, 1994).

From an evaluation standpoint, gauging the true impacts of a substance abuse education program can be a risky proposition based purely upon the answers to a single evaluation tool given at program's end. There have been past tendencies to report false positives based on program evaluation responses which lent a strong degree of good will to those programs, their participants, and indications of future behavioral choices (Rindskopf & Saxe, 1998). There has been a tendency for inconsistency in the findings presented by evaluation tools when compared to actual behaviors. Part of that can be attributed to the lack of specific goals or parameters for measurement, from a program objective standpoint, used to determine the outcomes or impacts of the program. Another reason has been due to the curriculum of the programs and the varied approaches regarding presentation of the program specific message as well as instruments not sensitive to detecting change or too general with regard to question content (Ennett, Tober, Ringwalt, Flewelling, 1994).

With regard to the educational programs themselves, many have argued that the only true evaluation of the effectiveness of the study is the evaluation of the objectives the program sets forth and the change in program audience knowledge or attitude resultant from curriculum exposure (NRC, 2001). Program specific evaluation, from the standpoint of measuring the impact of curriculum on participants, may be most effectively gauged from a post then pre study designed to reduce the potential for measurement or sampling error, and gauge the attitudes of program participants after exposure to curriculum, and compare them with attitudes of the same participant from before curriculum exposure (NRC, 2001). The longitudinal study will represent the most accurate long range representation of choices and behaviors relating to choices individuals make regarding substance usage, but in a situation where a longitudinal study will not be employed, the post then pre study has shown itself to be an effective form of evaluation

with regard to gauging the impact of program messages upon participants and as a gauge of how the program ultimately met objectives (Rindskopf & Saxe, 1998; NRC, 2001).

The summative evaluation typically given to substance abuse educational program participants is typically a formalized evaluation given to participants to gauge how well the program either conveyed the curriculum message about substance usage, or affected the attitude of the program participant regarding substance abuse (NRC, 2001, Ennet, Tobler, Ringwalt, Flewelling, 1994, Cole, 2000). The latter is typically a post then pre study designed to gauge the differences in attitudes among program participants from post program curriculum exposure compared to pre program curriculum exposure and analyze the changes in knowledge or attitudes among participants to gauge if there was any statistical significance that relates to an effect that may be correlated to future behavioral choice (Rindskopf & Saxe, 1998). The post then pre style of evaluation is popular within education and Extension because it attempts to correct one of the key problems of a traditional pretest posttest style evaluation.

A traditional pre-test and post-test design has the potential for respondents to over estimate or under estimate their knowledge, attitude, confidence, etc. before being exposed to the treatment (activity or program) and may not show, as you say, true differences in the items of interest. The post-then-pre allows them to consider these statements at one point in time and reflects a truer assessment of change. Plus, from a logistics standpoint, the post-then-pre is one piece of paper as compared to two with the traditional method where ID numbers may need to be matched up (Kohn & Rockwell, 1989).

The challenge with a post then pre evaluation tool is to develop questions specific to the content of the program curriculum that identify specific knowledge componenets, behaviors, or attitudes that may change as a result (Kohn & Rockwell, 1989; Linn & Slinde, 1977). With

regard to substance educational programs, developing the programs from a behavioral change perspective and incorporating curriculum and activities that are most likely to have a significant impact then becomes paramount. Program developers and evaluators should take time to identify specific attitudes and messages they wish to convey to their audiences, then plan engaging activities that will have a significant impact upon the behavioral attitude of the participant, as well as educate them. Accomplishing this requires the program to present information that illustrates a topic or substance is not merely "bad" per se, but why that particular substance or topic is detrimental to their health or well being, and then develop their subsequent evaluation around the change in attitude or knowledge level to measure the impact of that part of the program (Linn & Slinde, 1977; Howard & Dailey, 1979; NRC, 2001; Rindskopf & Saxe, 1998). A post-then-pre evaluation is most effective when program evaluators link the curriculum to the evaluation giving researchers and programmers an idea of the impact of the program upon the attitudes and knowledge level of the program participant, and in the absence of a longitudinal study, presents an effective tool to measure program impact with regard to the level of knowledge gained and changes in attitude produced (Linn & Slinde, 1977; Howard & Dailey, 1979; Kohn & Rockwell, 1989; NRC, 2001; Rinskopf & Saxe, 1998; Ennet, Tober, Ringwalt, & Flewelling, 1994).

The Statement of the Problem

Substance abuse among school aged individuals is associated with a number of problems including promiscuity, school attendance, academic success, and legal problems. Substance abuse has also been strongly linked to suicide among youth, with one study suggesting that 53% of 133 studied suicides of subjects under the age of 30 had a primary diagnosis of substance abuse (Fowler, Rich, & Young, 1986; Stickle & Terranova, 2003). Similarly, alcohol related

motor accidents, defined as accidents caused by the usage of alcohol by the operator of the motor vehicle, are the leading cause of death relative to automobiles among the 15 – 24 year old population (Stickle & Terranova, 2003; American Academy of Pediatrics, 1987). Effectively educating young people about the dangers of substance abuse is paramount from a standpoint of prevention of usage. Studies indicate that as the age of school children approaches young adulthood, substance awareness and their chances for usage increase substantially, with the actual usage rate of certain substances doubling between the eighth and tenth grade (Johnston, O'Malley, & Bachman, 2002).

Substance abuse is widespread among American youth with studies showing that over half of all students have tried an illegal drug at the time of their high school graduation. Furthermore, two thirds of American students have tried cigarettes by 12th grade, with one in three reporting they are smokers by graduation. Thirty seven percent of 8th graders have tried cigarettes with 12% reporting they are smokers. Alcohol usage is even more prevalent with 80% of high school seniors reporting they've tried alcohol and 50% of eighth graders reporting they've tried alcohol. Twenty one percent of eighth graders report having used marijuana with 50% of high school seniors reporting the same. Hallucinogenic drug use isn't as prevalent, but the usage of hallucinogenic drugs triples from grade 8 to 12, and nearly 20% of high school report experimentation with hallucinogenic drugs (Johnston, O'Malley, & Bachman, 2002).

In the United States, substance abuse education programs have seen widespread growth since the 1960's with a varied approach for instruction, content, structure, and evaluation. The common goal of the programs is to educate program participants, defined typically as school aged students from grades three through twelve, about the dangers of the use of alcohol, tobacco, and controlled substances (O'Rourke & Barr, 1974; Brody, 1975; Brown, 2001).Evaluations of

substance abuse programs have produced mixed results in past projects ranging from the reporting of false positives with regard to program impacts, which suggest that the presentation of the negative effects of substance abuse are enough to ward off later usage, to results that suggest a difference in the effects of programs along gender lines (Cole, 2000; Roberts, Fournet & Penland 1998; Stickle & Terranova, 2003).

Evaluators of substance abuse education have typically used one of two methods to study the outcomes or impacts of the curriculum specific to the given program, longitudinal studies or summative evaluations of attitudes toward substance usage at program completion. The longitudinal method attempts to track program participants after they have taken part in a specific substance abuse educational program and report on their choices relative to usage of illegal drugs, tobacco, and alcohol. While longitudinal studies are effective in their measurement of behavioral intent compared to actual choices regarding substance usage, a longitudinal study may be flawed in that it places emphasis on the behavior of subjects long removed from the actual curriculum and such studies are expensive, requiring researchers to monitor program participants over an extended period of time, sometimes years. Thus while it may be used to measure the ultimate outcome of a substance abuse educational program, there has to be weight given to time since program completion, growth and maturity of the individual, as well as changes in environmental factors surrounding the program participant since the completion of the substance abuse educational program (Ennett, Tober, Ringwalt, & Flewelling, 1994).

Nonetheless, several studies have shown that there is significant erosion in the effectiveness of substance abuse educational programs over the course of time. Most notably would be two studies by the Research Triangle Institute. The first was a 1994 study, which analyzed eight previous studies relating to the Drug Abuse Resistance Education (DARE)

project, where researchers concluded that DARE had only a short term effect with regard to the reduction of drug usage and that several other programs were more effective in prevention of substance usage (Ennett, Tober, Ringwalt, Flewelling, 1994). The second was a 1997 study sponsored by the U.S. Department of Education which tracked 10,000 fifth and sixth graders from 1991 to 1995 and found programs other than DARE to be more successful in preventing drug use and promoting anti-drug attitudes among students while recommending that DARE increase emphasis on role-playing and decrease emphasis on self-esteem and establishing negative attitudes toward drugs (Silvia, Thorne, 1997).

A key connection between the more effective programs was their development from a behavioral standpoint, meaning that they targeted specific behaviors and areas of knowledge and used activities that would maximize the impacts on both knowledge attainment and perceptions of program participants by active engagement (Ennet, Tober, Ringwalt & Flewelling, 1994; Silvia & Thorne, 1997; Stickle & Terranova, 2003). Merely casting drug usage into a bad light isn't an effective enough tool to generate real behavioral change among program participants because it doesn't do enough to educate them about the specific dangers of drug usage. When programmers design curriculum to educate participants regarding the dangers of drug usage that specifically target issues such as personal health, future attainment of goals, finances, and legal ramifications, participants are more likely to understand what the detrimental aspects of drug, alcohol, or tobacco usage are (Lynam et al, 1999; Kreuter, Lezin & Young, 2000; Evans, 1997). When a program participant hears that cigarettes are bad for him or her, it is far less effective than seeing a cardiac patient dying of emphysema and having the chance to hear what the negative health aspects of cigarette smoking are from a doctor who specializes in cardiac and lung disorders and health.

To truly measure the effectiveness of a program, the evaluation must then be reflective of the curriculum and address specific issues contained in the program to gauge what the impacts of program were (Linn & Slinde, 1977; Kohn & Rockwell, 1989). It isn't merely enough, as illustrated in the example above, to ask about the participants' attitudes toward cigarette smoking using a post then pre evaluation form. To gauge the true impact of the program, the section dealing with tobacco usage must be more specific to the curriculum and the questions should center around the effects of tobacco on the lungs to gauge the level of knowledge the participant had prior to curriculum exposure (pre) and compare it to the level of knowledge gained or change in attitude after curriculum exposure (post). By employing this behavioral measurement approach to target areas of impact, engaging the learner in the pursuit of knowledge in those areas of impact, and then formulating our evaluation tool consisting of sections that focus on those specific ideas within the curriculum, we can then use the post then pre summative evaluation to measure change in attitude toward tobacco, alcohol, or drug abuse and compare the impacts against program objectives (Linn & Slinde, 1977; Kohn & Rockwell, 1989; Ennet, Tober, Ringwalt, & Flewelling, 1994; Rindskopf & Saxe, 1998). Producing a change in attitudes toward substance abuse that is profound enough to impact the life of the program participant remains the key challenge of substance abuse educators and program developers (NRC, 2001; Ennet, Tober, Ringwalt, & Flewelling, 1994; Rindskopf & Saxe, 1998).

Purpose of the Study

The purpose of the study was to examine the impacts and evaluation of the Georgia Cooperative Extension Service and National 4-H Foundation's *Health Rocks!* program, delivered to school aged youth between the fourth and twelfth grade, which varied in curriculum content

depending upon age. Specifically this study evaluated the current evaluation instrument for sensitivity, reliability, and validity?. The objectives of the study were as follows:

1. Identify the level of participation in curriculum and activities of *Health Rocks!* program participants.
2. Describe the respondents based on selected demographics of the 4-H *Health Rocks!* program participants who completed the survey instrument.
3. Analyze the survey instrument used by *Health Rocks!* to determine constructs and the reliability of items within constructs.
4. Based on participant responses to the post then pre evaluation tool, determine if there was a change in knowledge, attitude, or behavioral intent.

Justification for the Study

In an environment where substance abuse education programs are oftentimes administered using scare tactics such as law enforcement visits to school and curriculum administration by professionals whose expertise lies outside the boundaries of education, the *Health Rocks!* program uses state Extension youth education personnel as program administrators and educators. The usage of fear as a tool to deter youth from substance usage has been found to be ineffective because it doesn't properly instill the specific dangers of substance abuse in program participants and in some instances, creates a level of resentment and hostility toward program administrators and educators, who are in some cases law enforcement officers (Brody, 1975; Berkowitz, 2001). Program participants were Georgia 4-H members who have the common bond of 4-H membership and who have a strong degree of familiarity and trust with those are charged with educating them about the dangers of substance abuse. *Health Rocks!* employs elements of Bookchin's social ecology (2004), which uses educational environments to

convey the effects of knowledge gained on the individual rather than imposing upon the individual some change to their society as a whole via an authoritative agency (Bookchin, 2004).

For 4-H and Extension educators, tackling substance abuse education straight on may be a step outside the realm of topics traditionally focused upon, which have included leadership, agricultural and community involvement projects, and youth development. But the learning environment is intriguing because it presents a captive audience of youth familiar with their instructor and a curriculum designed to target the specifics of why substance abuse education is bad for the individual. This study sought to identify the changes in attitudes of 4-H students regarding substance abuse that was reported on the 4-H *Health Rocks!* evaluation form, how the form itself compares to the curriculum in the *Health Rocks!* manuals given to program participants, and to review whether changes to the evaluation form would garner more specific information regarding changes in knowledge levels and attitudes.

Limitations of the Study

The primary limitation for the study was that completion of the evaluation instrument was contingent upon attendance and completion of at least ten hours of *Health Rocks!* curriculum. The curriculum was presented to middle and high school aged youth during 4-H meeting times in different counties across the state of Georgia who actively chose to participate in *Health Rocks!* with the condition that evaluation materials would be given at program completion and that permission of parents via a parental consent form, which is standard procedure when conducting evaluations with youth, would be required. The completion of 10 hours of curriculum, parental consent form, and evaluation produced a relatively small sample size given the total audience for presentation of *Health Rocks!*. As with any evaluation

employing self-reporting, caution is suggested in interpretation due to potential measurement error.

The Delimitations

This study will not attempt to evaluate the program educators. This study will not make determinations regarding the program curriculum. This study will be limited to program participants who have completed the National 4-H Council *Health Rocks!* survey instrument.

Terms

Attitude changes - changes in the perceptions of program participants, after completion of the *Health Rocks!* program curriculum, toward the subject matter of the curriculum, relative to perceptions of program participants before completion of the *Health Rocks!* program curriculum.

Evaluation – a systematic comparison of the impacts of a program to the objectives of a program. There is no clear or concrete definition of evaluation, but it essentially "is a determination of merit, worth, change, or significance using criteria against a set of standards" (Hurteau, Houle, Mongiat, 2009).

Cooperative Extension Service – a non-formal educational program implemented in the United States by the Cooperative State Research, Education, and Extension Service. Individual state Cooperative Extension services are administered by colleges and universities charged with Extension under the Morrill Act of 1890. As the land grant universities of each state were not open to all races, some states may have more than one land grant college and thus state extension may be tied to more than one land grant university.

4-H - A youth organization administrated by the Cooperative Extension Service and National 4-H Foundation that attempts to assist and educate youth and help them in developing life skills and forming attitudes that will enable them to become self-directing, productive, and contributing members of society.

Health Rocks! – a substance abuse education and prevention program administered by the National 4-H Foundation with grants given to individual state 4-H chapters wishing to participate. States are charged with meeting certain expectations for administration, chief among them being exposure numbers, and will be responsible for administering the curriculum and entering in evaluation data. Evaluation data is interpreted by University of Nebraska at Lincoln extension personnel and Nebraska is the lead institution for the program.

Outcomes - the product(s) of the program itself, what it produces. Outcomes are measurable in terms of the original program objectives and whether or not the outcomes match those objectives.

Practical significance - the effects of the program, relative to the curriculum, and whether or not they're large enough to be of practical significance within the behaviors and perceptions of participants.

Social Ecology – holds that present ecological problems are deep rooted in social problems, particularly in dominatory hierarchical political and social systems. These have resulted in an uncritical acceptance of an overly competitive grow-or-die philosophy. It suggests that this cannot be resisted by individual action such as ethical consumerism but must be addressed by more nuanced ethical thinking and collective activity grounded in radical democratic ideals. The complexity of relationships between people and with nature is emphasized, along with the importance of establishing social structures that take account of this (Bookchin, 2004).

Statistical significance - the likelihood that the significance of the data garnered from the evaluation instrument didn't occur by chance and also includes the significance level, which is the amount of evidence required to prove the statistics didn't occur by chance.

Substance abuse – is defined as the use of illegal drug substances such as narcotics or hallucinogens, and the use or abuse of legal substances such as tobacco or alcohol. Substance abuse has a high correlation of detrimental issues for individuals and societies.

Substance abuse education – educational programs that attempt to educate program participants about the negative consequences and effects of substance abuse.

Abbreviations

HR!- National 4-H *Health Rocks!* Program

Extension – Cooperative Extension Service

Assumptions

The first assumption is that there is a need for the presentation of *HR!* curriculum among the program's target audience, 10 - 15 year old youth involved in 4-H programs. The second assumption is that the target audience for the program curriculum will be receptive to the curriculum presented. The third assumption is that the target audience will respond to the survey instrument in an honest manner representative of their attitudes toward the subject matter of the curriculum.

Summary

The purpose of this study was to examine the National 4-H and Georgia 4-H Council's *HR!* program and the data the evaluation instrument provided regarding attitudes toward drug and substance use. The study sought to explore the evaluation tool to determine whether it was specific in what it asked of students in order to maximize the impact and present a true gauge of the post then pre attitude changes within program participants. Furthermore, the study sought to examine the questionnaire constructs to determine if changes in the constructs would help assess changes in knowledge, attitude, or behavioral intent. Chapter one provided an introduction to the problems program developers and administrators face when developing substance abuse education curriculum and introduced the *HR!* program and the environment for education and evaluation the administraters used.

The guiding objectives the study used were discussed. This study sought to examine the curriculum and evaluation tool of the *HR!* program, examine the data the questionnaire produced, and attempt to examine whether changes in questionnaire construct might have effects on the type and accuracy of data produced. As a result of this study, extension educators may have a better framework in which to design curriculum and evaluation tools for future substance abuse educational programs. Chapter two will discuss the literature reviewed for the study and provide further historical and current framework for substance abuse education, 4-H, and extension education.

CHAPTER 2

A REVIEW OF THE LITERATURE

This literary review will introduce 4-H and briefly discuss the history and present incarnation of the national organization as well Georgia 4-H and the *HR!* program. The review will also examine existing studies relative to substance abuse education and trends in the field of substance abuse prevention. Social ecology and community focused substance abuse prevention programs will be highlighted as they combine to form the core of modern substance abuse prevention education and are the basis for the 4-H *HR!* curricula and the review will briefly examine the war on drug abuse in the United States. The review will discuss previous evaluations of substance abuse education programs as well as highlight the problems associated with evaluation and the relative divide between scientific study and existing factual evidence in support of successful changes in attitudes and actions relating to substance abuse education among youth.

4-H

In the United States, 4-H is a youth development organization administered by the Cooperative Extension Service of land grant universities under the umbrella of the United States Department of Agriculture's Cooperative State Research, Education, and Extension Service. Originating from groups centered around educating rural youth on agricultural technologies, the organization today focuses on youth development in areas such as science and technology, citizenship, and leadership. 4-H reaches approximately 6.5 million youth nationwide thru a network of 90,000 clubs. The National 4-H Council is headquartered in Chevy Chase, MD and

administers educational programs and activities in all 50 states as well as several foreign countries (National 4-H Council, 2009).

Georgia 4-H

Georgia 4-H originated in the early part of the 20th century as a form of youth education for the children of farmers and rural residents, and today is one of the largest state 4-H organizations in the country. Reaching approximately 156,000 youth annually, Georgia 4-H is administered thru the Cooperative Extension Service as part of the College of Agricultural and Environmental Sciences at the University of Georgia (Georgia 4-H, 2009). Georgia 4-H is divided into Cloverleafs, defined as 5th and 6th graders, Juniors, defined as 7th and 8th graders, and Seniors, defined as 9th thru 12th graders (Georgia 4-H, 2009). Georgia 4-H employs a network of 5 facilities, including camp Rock Eagle which is the largest youth facility in the world, and extensive training and educational programs designed to foster youth development (Georgia 4-H, 2009). Georgia 4-H'ers are exposed to a variety of environmental, agricultural, health, technology, citizenship, and leadership learning activities which employ an experiential learning approach and are very hands on and interactive in nature.

Project Achievement, one of the most prominent 4-H competitions in the nation, allows students to choose a particular topic of interest, investigate and research the subject, then develop a presentation regarding their findings for competition with other 4-H'ers throughout the state (Georgia 4-H, 2009). Georgia 4-H state council takes place at Rock Eagle over the course of one weekend in June for upcoming 9^{th} graders thru recently graduated seniors. During this weekend, 4-H'ers elect state officers and a state board of directors, and participate in the "Iron Clover" competition which is an Olympic themed event pitting 4-H districts, of which there are 4, Northeast, Northwest, Southeast, and Southwest, against one another (Georgia 4-H, 2009).

The Georgia 4-H ambassador program offers 4-H'ers the opportunity to serve as youth educational leaders and recruitment agents within the 4-H program. Ambassadors are trained in the educational program areas offered for the year, and act as assistants and educators for the particular area in which they are trained (Georgia 4-H, 2009), assisting county 4-H Agents in the presentation of program curricula for the particular area in which the ambassador is trained. Ambassadors receive training at Rock Eagle in May, thus beginning their term as Ambassadors. For 2010, the Georgia 4-H Ambassador tracks were *HR!*, Operation Military Kids, Global Programs, and SET (Science, Engineering, and Technology) (Georgia 4-H, 2009). *HR!* was the program chosen for evaluation as part of this study.

Health Rocks!

Health Rocks! is a national 4-H curricula designed to promote healthy living among 8 to 14 year old youth and educate them about the dangers of drug, alcohol, and tobacco usage (National 4-H Foundation, 2009). State level grants were awarded to participating state 4-H organizations for training, curriculum, and implementation. *HR!* is in the third year of it's existence and granting foundations and the National 4-H Council charged personnel from the University of Nebraska to conduct an evaluation to determine the changes in attitudes among program participants occurred, relative to topics of curriculum, specifically targeting substance abuse. Program participants were evaluated, with parental consent, after completing at least 10 hours of *Health*

Rocks! curriculum.

Program educators consisted of county 4-H Extension Agents. Training for county agents was conducted during the Georgia 4-H Ambassador Training weekend in May of 2010 at Rock Eagle. *HR!* training and educational activities were then given throughout the summer at

individual sites in participating counties, and were integrated into the curricula of Georgia 4-H camps as part of the healthy living curriculum for participating students. Staff conducted the educational activities into the early fall and evaluations were given to participating students once they passed the 10 hour threshold relative to exposure to *HR!* curriculum. Specifically, the program itself sought to (a) educate middle and high school aged youth about substance abuse; (b) engage program participants in activities and curricula designed to actively involve them in their own educational process; (c) utilize the evaluation tool to determine the size and demographics of the population; (d) evaluate program participants utilizing a cross sectional post then pre evaluation instrument designed to measure, in a single post test, the changes in attitudes, knowledge level, or conceptions about substance abuse upon program participants.

Health Rocks! **Evaluation**

Personnel at the University of Nebraska at Lincoln developed the post then pre evaluation tool for *HR!* program participants, given at the completion of 10 hours of curriculum and activity exposure (National 4-H Council, 2009). The instrument is designed to measure and contrast the differences in attitudes among program participants before being exposed to the curricula and after. The questionnaire includes 36 items requiring two responses per item (before exposure and after), as well as a brief demographics section. County 4-H Agents administer the evaluation upon participant completion of 10 hours of *HR!* curricula and the survey tool will then be sent to the state 4-H office where the data will be aggregated into a spreadsheet and sent to the University of Nebraska at Lincoln for analysis (National 4-H Council, 2009).

Substance Abuse Education

Substance abuse education in the United States arose during the 1960s and originally centered around treatment of addiction and education regarding the dangers of drug, alcohol,

and, later, tobacco usage. Fear was the principal tool of early prevention education programs and the principle source of education came from within the law enforcement community acting as educational agents in schools, community centers, and churches (Brody, 1975). The messages conveyed by the early educational agents was one of zero tolerance and the dangers of drugs relating to a decline of society and the ruination of lives of the good people of America (NIDA, 1998).

In the late 1960s the rise of the marijuana culture and the "hippie" movement, and later the move into drugs called "harder" by law enforcement officials of the time period, such as LSD and acid, called for even more aggressive measures from the law enforcement community with the intention to scare program participants into a zero tolerance stance, not only with regard to personal use but also in relation to the actions of others they come in contact with (NIDA, 1998). Users of controlled substances, along with the substances themselves, became the enemy by the end of the '60s and in the early 1970s, and media outlets portrayed substance abusers as warped individuals committing horrible acts as the result of either evil intentions, or gross ridiculous negligence relative to their frayed mental states because of the effects of drug abuse (Frontline, 2000). The social stigmatization of drug abuse, which increased in prevalence throughout the 1960's, began to contradict the growing use of drugs among white, middle class Americans by the end of the decade though, and government officials and law enforcement were presented with a growing counterculture indifferent to the methods they employed with regard to substance abuse prevention education (Frontline, 2000).

The recognition that new measures had to be employed, as opposed to fear mongering and social stigmatization, began to produce educational curriculum touting the dangers of drugs relative to health, intelligence, and productivity (Biglan et al., 2003). In 1969, psychiatrist Dr.

Robert DuPont conducted a study which linked crime to drug usage; he conducted urinalyses of individuals entering jail in Washington DC during the month of August, finding 44% tested positive for heroin, producing the first widely reported study relating drug abuse to crime, which for a short time revived the social stigma bandwagon (Biglan et al., 2003). Subsequently, it was discovered that education combining the health risks of drug abuse by health officials, and relating drug abuse to crime by law enforcement officials, was more positively received by audiences than traditional fear based curricula during the early part of the 1970's (Biglan et al., 2003, Brody, 1975; Frontline, 2000).

Drug usage was still escalating in the United States at the end of the 1960's and during the early 1970's, partly due to the return of American troops from Vietnam relating their experimentation with drugs while overseas, then bringing their addictions home, and partly because of the introduction to U.S. streets of a powerful new drug called cocaine (Frontline, 2000). President Richard Nixon officially declared a "war on drugs" in 1971, but throughout the 1970's and 1980's, drugs such as cocaine, ecstasy, new marijuana strains, crack, and PCP would continue to push drug usage rates to previously unseen highs (Biglan et al, 2003).

The War on Drugs

The war on drugs, by the late 1990's, had escalated into a $40 billion yearly expenditure in the United States designed as a primarily preventative measure in order to combat the health, social, and economic costs of substance abuse estimated at $250 billion yearly (National Institute on Drug Abuse, 1998). Spending on preventative and control measures is high, yet there remains, to a degree, a divide in perceptions among governmental, health, and educational personnel regarding the effectiveness of substance abuse education programs. Evaluation data regarding successes and failures have been hard to gauge in terms of reliability and validity and there is a

divide between scientific knowledge regarding issues surrounding drug abuse and policy regarding prevention education (Berkowitz, 2001).

There exists a divide regarding substance abuse among the scientific community, consisting of health professionals, educational, and social psychologists; and among governmental officials, consisting of policy makers, law enforcement, and the judicial system regarding the proper curriculum development of substance abuse policies that have tended to create a continuing cycle of shortcomings in this area (Berkowitz, 2001). Furthermore, there has yet to be a significant advancement in the arena because of the lack of consensus on effectiveness of programs in terms of practical significance (NRC, 2001). Fear, as a prevention tool, and certainly as an education tool, was found to be lacking as it failed to properly instill in program participants knowledge as to why they should avoid certain substances and behaviors relative to their own health and safety (Berkowitz, 2001).

As education regarding substance abuse has become the more prevalent line of attack, the focus of educational programs has moved toward the perspective of social ecology, the foundation of which is creating an educational environment relating the dangers of substance abuse to program participants in order to show participants the effects addictions have on the human body (Berkowitz, 2001). Early on, the combination of health officials and law enforcement agents relayed the dangers of substance abuse relative to individual health as well as participation in illegal activity and crime (Frontline, 2000; Berkowitz, 2001). However, a change began to occur in the middle part of the 1970s as social ecology began to gain legs as an educational movement and the techniques employed therein began to be applied to substance abuse prevention and education (Berkowitz, 2001).

Social Ecology

Social ecology is a form of philosophy, developed in the 1960s, by Murray Bookchin and holds that present ecological problems are rooted in widespread social problems propagated by the hierarchical nature of society (Bookchin, 2004). Tackling the problems of society thus requires, according to Bookchin and followers, creative educational environments designed to diffuse tensions caused by society itself as a whole and show why certain behaviors or actions are counterproductive to the individual, rather than attempting to impose thru an organization such as law enforcement, some certain mandate upon the educational audience (Bookchin, 2004). The emphasis on education regarding societal problems leant itself particularly well to substance abuse prevention and there became a shift in the structure of prevention programs, in the mid 1970's, to reflect social ecology in order to more properly educate audiences as to exactly why substance abuse was detrimental to them (Brody, 1975; Aguirre-Molina, Gorman, 1996). As the movement toward social ecological practices grew so too did the movement away from the usage of law enforcement as educational personnel toward a model of community centered intervention activities (Aguirre-Molina, Gorman, 1996).

Community Empowerment and Intervention

Community Empowerment and Intervention attempts to use the strength and support of a community as the basis for educational activities designed for substance abuse prevention (Hallfors et al 2002). Acting as a coalition of educational counterparts, mentors, and persons of influence, empowered communities may exist within organizational structures such as school, church, or club activities and are typically composed of individuals who are perceived to be in position to influence decisions and behaviors relating to substance abuse, and in a broader sense life choices (Hallfors et al 2002). The perception that a community, meaning individuals more

intimately involved in the lives of the audience of a program or curricula is more effective at dissuading behaviors considered detrimental and effectively educating the targeted audience regarding substance abuse education is strongly rooted in social ecology theory (Brody, 1975). Rather than being faced with individuals unfamiliar to the targeted audience, community empowerment seeks to use familiar faces and settings as the basis for education in an attempt to dissuade any defense mechanisms or insecurities the audience may have because they're faced with authoritative figures outside their normal realm of interaction, such as police officers or health professionals (Brody, 1975; Sorenson, Emmons, Johnston, 1998).

According to social ecology theory, when audiences are familiar with the educators, yet the educators remain in a position of influence such as a 4-H leader or football coach, the effects of the curriculum are more likely to be taken as advice that is advantageous to listen to because it comes from people who are important to the audience and whom the audience does not want to disappoint because of their familiarity with (Brody, 1975). Evaluations of participants have shown that those who participate in programs designed from a community perspective generally give more positive feedback with regard to the lessons learned from the program, as well as the intentions of participants with regard to future behavior regarding controlled substances (Ennett et al., 1994; Brody, 1975; Saxe et al 2006). Nonetheless, the real effects of substance abuse prevention and education programs remain a hot topic for debate because of the problems associated with evaluation. Evaluation, of both program participants and programs themselves, tends to produce a mixed bag of results when compared with the realities of behavior, and there tends to be, as evidenced in several cases, an overstatement of successes, as well as failures (Ennett et al 1994; Rindskopf, Saxe, 1998).

Substance Abuse Program Evaluation

Evaluations of substance abuse prevention programs fall into two principle categories. First are the evaluations submitted by program participants at the end of the curriculum relating the changes in knowledge, attitudes, and behavioral intents that participants have received as a result of exposure to the curriculum known as summative evaluation (Rindskopf, Saxe, 1998). Second are longitudinal studies of participants of substance abuse prevention programs designed to see what the actual behaviors of participants were after having taken part in an abuse prevention program (Ennett et al., 1994; Lynam et al., 1999; Saxe et al., 2006). A large number of the evaluation instruments employed in the summative evaluation method focus on either a pre then post, or post then pre evaluation instrument that seeks to measure the differences in knowledge, attitudes, and intents from before exposure to the abuse prevention curricula, and after exposure (Ennet et al., 1994; Ennet & Tobler, 2003; Rindskopf & Saxe, 1998).

Past researchers have used a number of quantitative methods to analyze the data received from these evaluation tools, ranging from mean and standard deviation, to *t*-tests designed to determine the practical and statistical significance of the differences in the responses relative to particular knowledge, behavioral, and intent questions (Rinskopf & Saxe, 1998). As with any research, steps to ensure reliability and validity have to be carefully taken and there has, in some instances of prior research, been a tendency to report false positives and negatives relating to substance abuse prevention educational programs (Ennet et al., 1994; Rinskopf & Saxe, 1998; Saxe, 2006). Problems concerning internal reliability and validity, as well as sampling issues such as selection bias and prior history with, or exposure to, controlled substances have called into question the validity of programs and the ability of summative evaluation techniques, meaning evaluations given at the end of program curricula, to accurately produce data that

measures changes in knowledge or attitude, with particular emphasis on behavioral intent (Rinskopf & Saxe, 1998).

With regard to creating an accurate evaluation of the effectiveness of substance abuse prevention and education programs, relative to actions and behavioral intent, the longitudinal study has proven to be a bit more effective in terms of measuring the impacts programs have upon individuals with regard to their post-program actions (Rinskopf & Saxe, 1998). Using longitudinal studies of participants of drug abuse prevention programs such as Drug Abuse Resistance Education (DARE.) and Fighting Back, researchers have found varied results with regard to the impacts the programs have had on participants (Evans & Bosworth, 1997). Particular studies, such as the meta-analysis conducted by Ennett, Tobler, Ringwald, and Fwelling in 1994 regarding the D.A.R.E. program, have called into question the effectiveness of substance abuse prevention education and forced a re-evaluation of the curriculum taught by educators (Ennett et al., 1994; Rinskopf & Saxe, 1998; Saxe et al., 2006).

Again the problem arises with regard to outside influences having effects on the validity. Prior association with controlled substances is one of the hardest individual factors to account for, particularly given the addictive nature of the substances themselves and the likelihood that program participants may be participating because of court mandated sentencing which is implemented by many judicial authorities across the country. For researchers, finding a representative sample of youth taking part in substance abuse prevention education thru a community coalition, that hasn't been previously influenced by controlled substances either via usage or exposure to usage, has proven to be very difficult (Rinskopf & Saxe, 1998). Because of this, many of the studies conducted in the past, relative to the effectiveness of substance abuse prevention education, have reported positives or negatives that may be called into question

because of extraneous variables that have influenced the reliability and validity of the study. In addition, there is a tendency within the study of evaluation of drug abuse prevention education to report false positives and negatives regarding the programs (Rinskopf & Saxe, 1998).

Accurately Evaluating Impacts of Drug Abuse Prevention Education Programs

Accurately evaluating the impacts of drug abuse prevention and education programs requires particular attention to threats to internal reliability and validity of the studies conducted. Repeatedly testing subjects, with regard to their attitudes and intents concerning substance abuse and drugs has been shown to produce a bias because respondents report what they've been trained to report, particularly with regard to attitudes toward controlled substances and abuse and future behavioral intents (NRC, 2001). In a cross-sectional study, looking at the knowledge gained from the curriculum from a post then pre standpoint is believed to be a very effective way of measuring the impacts of the program (NRC, 2001). Behavioral intents may be measured from youth after exposure to substance abuse prevention curriculum, but as with any youth oriented educational activities, peer pressure, particularly during teen years, is a powerful variable that must be accounted for with regard to future behaviors (NRC, 2001).

What evaluators can accurately do is take the data conveyed to them by program participants regarding the knowledge gained, differences in attitudes from before exposure and after, as well as the behavioral intents of program participants and analyze that data from that particular group if a longitudinal study is not to be employed (Rindskopf & Saxe, 1998; NRC, 2001). If a longitudinal study is to be employed, then accounting for a long list of variables and an extensive following of the individual, as well as behavioral studies relative to choices will be employed to present as accurate a picture as possible regarding behaviors (NRC, 2001).

Theoretical/Conceptual Base

The theory of planned behavior, developed by Icek Ajzen in the mid 1980s, is part of a larger group of behavioral theories centered around the psychosocial model, which posits that biological, psychological, and social factors all factor into individuals' behavioral choices or intents (Ajzen, 1991; Wilson & Kolander, 2011) Evolving from the earlier theory of reasoned action, which according to Wilson and Kolander states that "behavior is a reflection of behavioral intentions where behavioral intentions are the probability that a person will or will not perform a certain behavior" (134) , the theory of planned behavior added that intentions are influenced by the perceived benefit of the outcome as well as the social norm relative to the behavior (Ajzen, 1991; Wilson & Kolander, 2011). Behaviors which are judged to be the norm for a particular society will be more appealing, given the absence of an obvious detriment, should the majority of the society engage in them, and this theory has been applied to substance abuse education in the past and fits very well with the context of programs (i.e., the majority of youth don't use drugs, therefore the normative behavior is to avoid substance usage thus it is easier to persuade youth against drug usage because of the numbers within the society engaged in substance abuse, compared to the detriments of usage).

The theory of planned behavior took the theory of reasoned action and added the concept of perceived control over one's behavior, known as perceived behavioral control (Ajzen, 1991; Wilson & Kolander, 2011). Perceived behavioral control incorporates the level of difficulty to begin or end a certain behavior and draws influences from past experiences. Key elements of the theory include attitude, subjective norms, perceived behavioral control, knowledge, behavioral intention, and behavior (see Figure 2 -1).

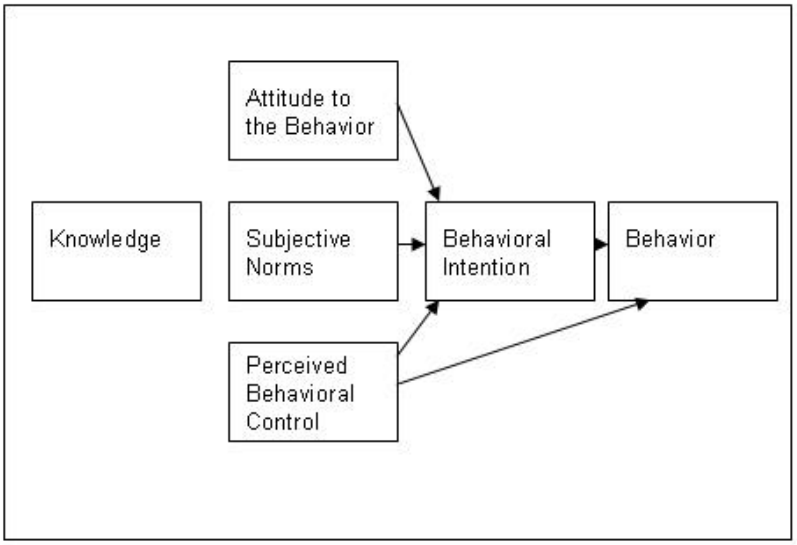

Figure 2 -1 Theory of Planned Behavior

The principle components of the theory may be defined as follows:

- Knowledge – the information an individual possesses about a behavior, based on learning and past history
- Attitude to the behavior – attitude toward the behavior, positive or negative, based on knowledge, subjective norms, and perceived behavioral control
- Subjective norms – what the rest of the given society is doing with regard to the behavior
- Perceived behavioral control – the perception regarding control of the behavior, "how easy can I start and stop"
- Behavioral intention – based on attitude, subjective norm, and perceived behavioral control, intent to either engage or not engage in the behavior
- Behavior – The action itself

The theory of planned behavior lends itself particularly well to youth substance abuse educational programs because it incorporates the element of the subjective norm, meaning what is the society doing and how does their behavior affect the decision of members regarding their

own behavior (Wilson & Kolander, 2011). Within the target demographic for youth substance abuse prevention education, primarily middle school youth, there is significant evidence that peer pressure is a strong contributing factor to decisions regarding substance experimentation and usage (NRC, 2001; Stickle & Terranova, 2003). The recognition that variables such as usage within the community, perception of usage within the community, knowledge about the detrimental effects of usage, and attitude toward usage allows programmers to create curricula which focuses upon reinforcing the norm (that the majority of their peers don't use drugs), building self-esteem and awareness among program participants, educating them with regard to the dangers of their choice to use, and empowering program participants to become agents of change within their communities (Wilson & Kolander, 2011). The key to targeting the curriculum toward a certain area of the theory of planned behavior is identifying the level of knowledge and attitude toward that behavior, with evaluation of program participants becoming paramount in identifying areas for reinforcement or curriculum change.

Description of Variables

There will be several independent variables associated with the sample. Independent variables:

- Gender
- Ethnicity
- racial background
- grade
- age

These variables have been determined from previous studies related to youth and substance abuse prevention education. The dependent variables will be:

- Knowledge
- Attitude
- Behavioral intent.

Chapter Summary

The literature review sought to introduce readers to 4-H and Georgia 4-H, as well as introduce substance abuse education, give a brief overview of its history and evolution, and introduce evaluation and problems associated with evaluation of substance abuse prevention educational programs. The longitudinal study is outside the realm of research for this particular project; however, because of the prevalence of longitudinal studies in the field of evaluation of effectiveness of substance abuse educational programming, problems associated with, and findings of, longitudinal studies were included. This review of literature was completed to form a basis for the methodologies and research of the study.

CHAPTER 3

METHODS AND PROCEDURES

Purpose and Objectives

This study sought to identify the impacts, defined as the change in knowledge level or attitude toward substance abuse as a product of the National 4-H Council's *Health Rocks!* curriculum on program participants after 10 or more hours of exposure to *Health Rocks!* curricula. Specifically, the study attempted to:

1. Identify the level of participation in curriculum and activities of *Health Rocks!* program participants.
2. Describe the respondents based on selected demographics of the 4-H *Health Rocks!* program participants who completed the survey instrument.
3. Analyze the survey instrument used by *Health Rocks!* to determine constructs and the reliability of items within constructs.
4. Based on participant responses to the post then pre evaluation tool, determine if there was a change in knowledge, attitude, or behavioral intent.

Research Design

The research was designed as an exploratory study, meaning that the evaluation instrument measured knowledge, attitude, and intent of program participants toward substance abuse and the effects of substance abuse upon their lives both after exposure to *HR!* curricula as well as before exposure to *HR!* curricula (Linn & Slinde, 1977). The instrument consisted of a one group retrospective post-then-pre test serving as a form of summative evaluation (Appendix

A). Included was a demographics section, as well as 40 questions, each requiring two responses, one for post *HR!* curriculum thoughts, attitudes, and intents, and one for pre *HR!* curriculum thoughts, attitudes, and intents regarding substance abuse, the prevalence of usage, the effects of substance abuse upon health, and daily life.

Program participants filled out the evaluation forms at the completion of 10 hours of *HR!* curriculum after receiving the signed consent of their parent or guardian. The strength of this design was that it allowed researchers to evaluate program participants in cross sectional manner with a one shot evaluation tool designed to measure changes in attitude or knowledge level surrounding topics specific to the curriculum (Fraenkel, Wallen, 2006, Linn, Slinde, 1977, NRC, 2001). While it sought to test students relative to curriculum of the program, a weakness of the study was a lack of consistency with regard to program curriculum. Instructors were able to choose from activities and lessons and there was no standardization of curriculum and activity from a scheduling or continuity standpoint. Some participants were exposed to 10 hours over the course of a 4-H camp weekend or youth conference. Other participants spent consecutive weeks learning curriculum in one or two hour increments as part of their school 4-H programming.

Likewise, there were several threats to the internal validity of the study associated with casual comparative, one-shot survey designs. The primary threats were the inability to manipulate the independent variables (participants had already been exposed to similar curriculum as part of another activity of from their peers or parents/guardians), as well as lack of control over content and student participation selection (Fraenkel, Wallen, 2006).

Because of the age range of program participants, there is a threat to the validity of the study from a subject characteristic standpoint. The knowledge and experiences of 16 – 17 year olds is far different than that of 11 – 12 year olds, and the same opportunities and experiences for

students do not exist within the varying 4-H clubs that took part in the program. As age increases, as already discussed in this document, so too does the likelihood that youth will have been exposed to or tried illegal substances, alcohol, or tobacco. There is also an increase in their knowledge level or perceptions about these substances and influence from peers on the perceptions of youth in their mid-teens, which is an additional threat to the validity of the study. Differences in gender, socio-economic level, school size, community size, average education level within the community, and parental educational level could play a role in the pre-disposition of students regarding substance abuse education, as well as in the opportunities of the program participants for pre-disposition to substance abuse education curriculum (Fraenkel & Wallen, 2006; Linn & Slinde, 1977).

There also exists a threat to the survey validity in that the questionnaire was administered by 4-H personnel in different settings and in different locations with the possibility arising that differing guidelines, time limits, or incentives were given to program participants for questionnaire completion. Finally, caution must be expressed in interpreting outcomes of a causal comparative study. There may be a relationship between the curriculum or an outside source and the outcome, and that may be reflective in the changes in attitude or knowledge among survey respondents, but the causation cannot be fully established (Fraenkel & Wallen, 2006; Linn & Slinde, 1977).

The Population

The population for the study was composed of Georgia 4-H'ers defined as middle and high school students, or students entering into the 6th grade thru recently graduated 12th grade students. Target sample, as defined by the goals of the National 4-H Foundation, was 7,000 students. The grant funding agency required that the response rate be 75% or greater of the

population exposed to 10 or more hours of *HR!* curriculum. Seventeen Georgia counties applied for grant funding for *HR!* programming and the population frame was 8,721 for total exposure. A total of 1,003 respondents submitted evaluations for a response rate that appeared on the surface to be 11.48%. Reasoning for the disparity in the total population frame and actual response is that the 1,003 respondents represents a census of program participants given the evaluation. The figure 8,721 is the total number of youth exposed to any part of *Health Rocks!* curriculum. All effort was made to make sure questionnaire respondents were involved in all classes and curriculum for *HR!* The sample was exposed to curricula at educational sites statewide, conducted by county 4-H agents, and at Georgia 4-H summer camps throughout the summer.

Procedures

The procedure for the program and study participation included application for grant money from the National 4-H Council by Georgia 4-H. Stipulations for grantee had to be met, including the guarantee that Georgia 4-H would present the curriculum to 7,000 program participants over the course of 2010. Georgia 4-H then established *HR!* as one of the tracks offered for ambassadors and 4-H participants for 2010 and counties within Georgia were offered the opportunity to apply to be a part of the program, which included money for materials and training of ambassadors and 4-H personnel who would present curriculum by Georgia 4-H program administrators.

Seventeen Georgia counties applied for and received the money for training and materials for the *HR!* program. Their respective ambassadors and presenters were trained during the Georgia 4-H ambassador training weekend in May of 2010. Counties then had the months of June – October to present the *HR!* curriculum and evaluate program participants, with parental consent forms being required for completion of the *HR!* questionnaire. Data collection began in

mid-summer 2010 at Georgia 4-H camps which participated in *HR!* activities, and continued thru the early fall of 2010. Initial report date was set by the University of Nebraska as October, but extensions were granted and more county programs were able to complete program presentation and evaluation. Data reports were sent to the Georgia 4-H State Office in Athens throughout the fall and winter of 2010 and the survey responses were aggregated by the researcher into a state report, which, in turn, was sent to personnel from the University of Nebraska at Lincoln in January of 2011.

Data interpretation for this separate study began in late March on the 1,002 responses entered into the University of Nebraska at Lincoln's reporting form. Aggregate data was analyzed using PASW 18. Means, standard deviations, and inferential and descriptive statistics were conducted to analyze respondent data. Instrument items were analyzed using a principle component analysis to establish constructs. Construct reliability was determined using Cronbach's alpha and means were compared to determine if differences existed between the pre curriculum exposure and post curriculum exposure.

The University of Nebraska at Lincoln and Instrument Development

The evaluation instrument for this study was a retrospective post then pre questionnaire designed to measure knowledge, attitudes, and behavioral intent regarding substance abuse from post *HR!* curricula exposure, as well as from pre *HR!* curricula exposure. According to Yan Xia, Extension education researcher at the University of Nebraska at Omaha, the survey itself was developed in steps beginning with the first version in 2009. Developers were Yan Xia, of the University of Nebraska at Omaha, and Maria de Guzman, of the University of Nebraska at Lincoln. Initially, the survey was developed based on the curriculum as an assessment of whether the learning outcomes could be delivered and achieved according to the curriculum. The sites

and states were randomly sampled given the information researchers had from the initial evaluation in 2009, and the survey was further refined independent of the curriculum. The four constructs were (a) knowledge, designed to measure changes in knowledge of participants from post then pre, (b) beliefs/attitude, designed to measure changes in belief and attitude toward substance abuse, (c) skills, which was designed to gauge the belief of participants in their educational abilities or actions as agents of change regarding substance abuse, and finally (d) assets in general, which was a generalized section designed to measure changes toward generalized statements regarding substance usage.

The Instrument

The instrument itself consisted of 36 questions with response columns for post curriculum exposure and pre curriculum exposure. The questionnaire employed a four-item response continuum (1 = strongly disagree, 2 = disagree, 3 = agree, 4 = strongly agree) for each of the questions, and each respondent had a 1-4 answer for post and a 1-4 answer for pre. Total responses would thus number 72. There was also a demographics section which asked the gender, age, and grade level of the respondent, as well as the race, ethnicity, and size of the town the respondent is from. This section also garners information about the respondent's county, town, and state for 4-H reporting purposes, and finishes with the number of hours of *HR!* curriculum completed, and the number of activities the respondent participated in related to *HR!* .

Reliability and Validity - University of Nebraska

Reliability can be defined as the degree to which an instrument consistently measures what it intends to measure (Ary, Jacobs, & Razaveih, 2002). Also, it may be defined as "the extent to which measurements are repeatable" (Nunnally, 1978, p. 191). The reliability of the four constructs was determined by University of Nebraska researchers though was not made

available to the researcher for this study. The document was checked among several sets of researchers and program developers for face validity, and confirmatory factor analysis was performed based on previous years' data, with multiple indicators used for each construct. The original survey form had items that needed to be reverse coded and they were subsequently eliminated. The first survey had 80 items; the 2010 edition was trimmed to 36 items from the four constructs and was used in this study.

Reliability, Constructs, and Validity – Researcher

The researcher performed a principal component analysis after data collection using PSAW 18 to determine the question constructs based on the way respondents interpreted the questionnaire. The principal component analysis initially revealed five constructs ranging from 13 to two questions with a pattern matrix suggestive of a high degree of correlation. The question constructs were tested for their reliability, and the constructs, in order of size, and their Cronbach's Alpha coefficients were: knowledge, .93; beliefs, .82; attitudes, .72; skills, .72; assets in general, .60. In addition, analysis revealed four questions that had low correlations to the other questions and were subsequently dropped for the analysis, resulting in 32 questions used for analysis.

Data Collection

HR! program participants were given the questionnaire after completion of ten or more hours (except in some cases when less were recorded) of curriculum and activity participation. There was no set design for when the evaluation would be given to participants, and some participants report more than ten hours participation of exposure at the time of evaluation. All respondents needed permission from a parent or guardian in order to participate in the evaluation, as is standard procedure when conducting evaluations with minors. Respondents

were not placed under any time limits for response, though some evaluations were given at the conclusion of day of programming and completion meant the participant was free to leave. Respondents returned their completed questionnaires to 4-H group leaders and they were mailed to the Georgia 4-H offices on the campus of the University of Georgia for further processing.

Data Analysis

After entering the questionnaire data and sending it to the University of Nebraska at Lincoln for their analysis, the researcher performed data analysis using a personal computer and PSAW (formerly the Statistical Package for Social Sciences SPSS). PSAW is among the most popular programs used for statistical analysis in social sciences, and was chosen because of availability to the researcher and ease of interpretation in terms of the analyses the program performs as well as the program's compatibility with most widely used statistical techniques.

Frequencies and percentages were used to analyze nominal data including demographic data which had been assigned numeric conversions to aide in data analysis. Analysis of a census of the responses was conducted using descriptive statistics. Means and standard deviations were employed to compare the responses of the post then pre test. Paired samples tests were also performed on each construct to show the upper and lower confidence intervals, and *t*-tests were employed to determine if differences existed in respondents' answers. Analysis of Covariance (ANCOVA) was used to compare pre and post scores while controlling for extraneous variables (Miller, 1998).

Summary

This chapter discussed the program design, evaluation instrument, data collection, and purpose of the study relating to the National 4-H Council's *HR!*. The population from which research was conducted was discussed. The chapter also introduced the analysis techniques the

researcher used to examine the survey instrument and the methods of analysis performed upon the data the sample produced.

CHAPTER 4

RESULTS

The Findings

In this chapter, research findings are presented relative to the objectives of the study:

1. Identify the level of participation in curriculum and activities of *Health Rocks!* program participants.
2. Describe the respondents based on selected demographics of the 4-H *Health Rocks!* program participants who completed the survey instrument.
3. Analyze the survey instrument used by *Health Rocks!* to determine constructs and the reliability of items within constructs.
4. Based on participant responses to the post then pre evaluation tool, determine if there was a change in knowledge, attitude, or behavioral intent.

Utilizing the data collected from 1,003 respondents, results are divided into categories corresponding to the objectives of the study.

Objective 1. Identify the level of participation in curriculum and activities of *Health Rocks!* program participants.

Program participants were asked to provide the number hours of attendance and number of activities in which they participated as part of their HR! program curricula. Table 4-1, on the next page, contains frequency of response for particular hours.

Table 4-1

Number of Hours of Health Rocks! Training (n = 1,002)

Number of hours	Frequency of response	As a percentage of responses
1	3	.3
2	21	2.1
3	14	1.4
4	8	.8
5	5	.5
6	1	.1
10	519	51.7
11	364	36.4
12	19	1.9
13	20	2.0
14	6	.6
15	22	2.2
Missing	2	.2
Total	1003	100.0

Most respondents (94.8%) reported they had completed ten or more hours of *HR!* programming curriculum. The most frequent answer was 10 hours of training, representing 51.7% of all responses and second was 11 hours of curriculum exposure (36.4%). Respondents who were exposed to less than 10 hours of curriculum exposure only numbered 72 and represented 5.2% of all respondents.

When asked “How many activities have you completed,” most respondents (90.6%) reported that they had completed 10 or more *HR!* activities (see Table 4-2). The most frequent answer was 10 activities (81.7%) and the second most frequent response rate was nine activities (5.2%). Respondents who were exposed to less than five activities numbered 19 (1.9%) and more than 10 activities numbered 89 (8.9%). Table 4-2, on the next page, reports the data for activity participation.

Table 4-2

Number of Health Rocks! Activities Completed

Number of activities	Frequency	Percentage of Responses
1	1	.1
2	11	1.1
3	5	.5
4	2	.2
5	11	1.1
6	1	.1
7	12	1.2
9	52	5.2
10	819	81.7
11	13	1.3
12	28	2.8
14	15	1.5
20	18	1.8
30	1	.1
32	8	.8
50	4	.4
Missing	2	.2
Totals	1003	100

Objective 2. Describe the respondents based on selected demographics of the 4-H *Health Rocks!* program participants who completed the survey instrument.

A reliability analysis is not needed with demographic data because individual items are used to describe participants' individual characteristics. According to Nunnally (1978), what is generally true of respondents' demographic characteristics today will generally be true the next day barring some type of major life altering event. The majority of respondents were female (55.3%, 44.4%, see Table 4-3). Three respondents did not fill in information regarding their gender and represented .3% of respondents.

Table 4-3 *Gender*

Gender	Frequency	Percent
Female	555	55.3
Male	445	44.4
No Response	3	.3
Total	1003	100

Of the 1,002 respondents, the modal age was 11 (n = 356, 35.5%) with a minimum of 6 and a maximum of 16 (see Table 4-4). Frequently reported ages also included 10 (n =166, 16.6%), and 12 (n =163, 16.3%), while 63 respondents (6.3%) failed to report their age.

Table 4-4

Age

Age	Frequency	Percentage
6	4	.4
7	8	.8
8	24	2.4
9	85	8.5
10	166	16.6
11	356	35.5
12	163	16.3
13	32	3.2
14	47	4.7
15	21	2.1
16	27	2.7
Missing	63	6.3
Total	996	100.0

Grade level shows considerable range variation, with a modal response of 6th grade occurring 389 times (38.8%). See Table 4-5 for grade responses.

Table 4-5

Grade Level

Grade	Frequency	Percent
4	119	11.9
5	220	21.9
6	289	28.8
7	149	14.9
8	20	2.0
9	58	5.8
10	45	4.5
+	3	.3
Total	1003	100

The majority of respondents, 60.2% (n = 604) identified themselves as Caucasian. See Table 4-6 for the racial makeup of the sample.

Table 4-6

Race

Race	Frequency	Percent
Caucasian	604	60.2
African American	271	27.0
Native American	22	2.2
Asian	6	.6
Multiracial	31	3.1
Unknown	66	6.6
Missing	3	.3
Total	1003	100

Seen in Table 4-7 are the responses for ethnicity. Respondents identified themselves as Non-Hispanic/Latino with a 90.1% frequency representing 904 responses.

Table 4-7

Ethnicity

Ethnicity	Frequency	Percent
Hispanic/Latino	81	8.1
Non-Hispanic/Latino	904	90.1
No Answer	3	.3
Missing	15	1.5
Total	1003	100

For the scope of this study, researchers also wanted to determine where the curriculum was being taught, meaning urban, suburban, or rural locations. Table 4-8 shows that majority of respondents (n =649, 64.7%) participated in the *HR!* program in a suburban environment. Table 4-19 shows the county in which respondents participated in *HR!* training. McIntosh County was the modal response (n =384, 38.3%).

Table 4-8

Geography

Geography	Frequency	Percent
Urban	52	5.2
Suburban	649	64.7
Rural	295	29.4
Missing	7	.7
Total	1003	100

Table 4-9

County of Health Rocks! Training

Georgia County	Frequency	Percent
Bacon	6	.6
Butts	22	2.2
Columbia	48	4.8
Johnson	15	1.5
Madison	15	1.5
McIntosh	384	38.3
Monroe	11	1.1
Newton	19	1.9
Pierce	6	.6
Pulaski	50	5
Rockdale	43	4.3
Seminole	26	2.6
Spalding	21	2.1
Stephens	15	1.5
Taylor	260	25.9
Toombs	62	6.2
Total	1003	100

Objective 3. **Analyze the survey instrument used by *Health Rocks!* to determine constructs and the reliability of items within constructs.**

Principal component analysis (PCA) of the response data revealed five constructs. The questionnaire items identified in the PCA were analyzed by two researchers who determined the questions appeared to form constructs. Further analysis determined the construct names to be actions, knowledge, beliefs/attitudes, skills, and general assets (an effort was made by researchers to keep construct names similar to University of Nebraska – Lincoln researchers' constructs). The questions composing the constructs come from the various sections of the document. Five questions did not factor in a principal component. The constructs are shown in Table 4-10.

Table 4-10

Components Extracted after Exploratory Factor Analysis with Promax Rotation

Component	Eigenvalue	Percent Variance	Cumulative Percent
Actions	11.59	33.10	33.10
Knowledge	2.48	7.08	40.18
Beliefs/Attitudes	2.35	6.71	46.88
Skills	1.77	5.06	51.94
General Assets	1.58	4.51	56.46

The Cronbach's Alpha coefficients for the question constructs were used to determine construct reliability. Table 4-11 shows the constructs ranked in order of reliability revealed by the PCA.

Table 4-11

Construct Reliability

Construct	Reliability	Number of Items
Actions	.926	13
Knowledge	.820	6
Beliefs/Attitudes	.722	4
Skills	.717	5
General Assets	.595	3

Objective 4. Based on participant responses to the post then pre evaluation tool, determine if there was a change in knowledge, attitude, or behavioral intent

The respondents' answers to the post then pre evaluation tool, after being grouped into the constructs, were analyzed using paired samples *t*- tests to determine if differences existed in pre and post responses. Table 4-12 shows the findings of the paired samples statistics for the constructs.

Table 4-12

Paired Samples Statistics

Construct	*N*	Mean (*SD*)	*t*-value	*df*	*p*	Cohen's *d*
Actions Pre	988	3.53 (.502)	-13.025	987	.000	-.430
Actions Post	988	3.71 (.313)				
Knowledge Before	988	3.44 (.518)	-13.104	987	.000	-.483
Knowledge After	988	3.66 (.383)				
Beliefs/Att. Before	987	3.69 (.486)	-7.931	986	.000	-.259
Beliefs/Att. After	987	3.80 (.352)				
Skills Before	987	3.59 (.585)	-8.223	986	.000	-.239
Skills After	987	3.71 (.402)				
Gen. Asset Before	987	3.37 (.715)	-14.845	986	.000	-.420
Gen. Asset After	987	3.63 (.505)				

Table 4-12 shows the paired samples statistics for the pre and post questions from each of the identified constructs. Mean refers to the mean respondent answer for the construct from pre and post curriculum exposure with standard deviation referring to the standard answer deviation from the mean response, and noting that our response scale ranged from 1 to 4, the mean answers

show change from pre to post. The next column refers to *t*-value as part of a *t*-test performed on the data in order to judge the significance of the difference between the two sample means of each construct. An alpha of .05 was set a priori. Moving to the column to the right of *t*-value is the degrees of freedom (*df*) column which refers to the number of steps that went into the estimation of the parameters of the sample, minus the number of intermediate steps (which is one – the sample mean, the only intermediate step, thus $N - 1 = df$).

The column to the right of *df* refers to *p* value, which is based on the assumption that the findings are the result of chance alone making no attempt to gauge the probability of that assumption being true. The term *p* refers to the probability of obtaining a test statistic at least as extreme as the one actually observed. When researchers see *p* values less than .05 or .01, corresponding to 5% or 1%, this allows for the rejection of Type I error (the tendency to report significance with regard to change when there is none) because of low probability. Thus researchers may say the data is statistically significant.

Cohen's *d* is defined as the difference between two means divided by a standard deviation. We see this applied to the construct data in the final column of Table 4-13 above. Cohen's *d* is frequently used to estimate sample size, with lower Cohen's *d* scores indicating the need for a larger sample size, and the inverse true with higher scores. Past researchers have defined large and small Cohen's *d* values - "effect size was reported using Cohen's d and should be interpreted using the "operational definitions" of .20 = small, .50 = medium, and .80 = large" (Cohen, 1992, p. 156; Morgan et al., 2002).

Summary

Chapter Four presented the study's findings relative to the stated objectives:

1. Identify the level of participation in curriculum and activities of *Health Rocks!* program participants.
2. Describe the respondents based on selected demographics of the 4-H *Health Rocks!* program participants who completed the survey instrument.
3. Analyze the survey instrument used by *Health Rocks!* to determine constructs and the reliability of items within constructs.
4. Based on participant responses to the post then pre evaluation tool, determine if there was a change in knowledge, attitude, or behavioral intent.

Chapter Five will draw conclusions and make recommendations based on the results of the questionnaire.

CHAPTER 5

SUMMARY AND RECOMMENDATIONS

Substance abuse educational programs operate with the goal in mind to alter or reinforce the perceptions of program participants toward an attitude of negativity toward substance abuse. Programs that employ curriculum designed to engage learners and not only preach that drugs and controlled substances are bad, but relay to participants why these substances are harmful in the context of their own lives, have been shown to be effective in terms of the impact upon behavioral choices of participants (Ennet, Tober, Ringwalt, & Flewelling, 1994; NRC, 2001). The post then pre form of evaluation has likewise been shown to be an effective predictor of knowledge and attitude change when strongly related to program content (Dailey & Howard, 1979; Linn & Slinde, 1977).

An examination of the National 4-H Council and Georgia 4-H *Health Rocks!* program, specifically relating to the evaluation questionnaire, has shown there were elements of change in the perceptions of program participants. The post then pre evaluation tool was examined to determine how program participants received the document and whether question constructs could be formed from their responses. The constructs were then analyzed for their reliability, and the data from the constructs were paired and tested to determine differences in respondents' answers from before exposure to the curriculum and after 10 hours exposure to the curriculum.

Purpose and Objectives of Study

The purpose of the study was to examine the impacts and evaluation of the Georgia Cooperative Extension Service and National 4-H Foundation's *Health Rocks!* program, given to school aged youth between the fourth and twelfth grade, varying in curriculum content

depending upon age. Specifically this study examined the evaluation results from the *Health Rocks!* program and examine the changes in attitudes among program participants. The objectives of the study were as follows:

1. Identify the level of participation in curriculum and activities of *Health Rocks!* program participants.
2. Describe the respondents based on selected demographics of the 4-H *Health Rocks!* program participants who completed the survey instrument.
3. Analyze the survey instrument used by *Health Rocks!* to determine constructs and the reliability of items within constructs.
4. Based on participant responses to the post then pre evaluation tool, determine if there was a change in knowledge, attitude, or behavioral intent.

Review of Methods

Georgia 4-H offered the National 4-H Council *Health Rocks!* curriculum to individual counties as a grant in which to participate as part of the Georgia 4-H Ambassadors program for 2010. Seventeen counties chose to participate in the *HR!* program and received training and funding. The seventeen counties, along with Georgia 4-H administration, administered the program to 8,752 youth during 2010 and produced 1,002 responses to the *HR!* questionnaire.

Curriculum for the *HR!* program was developed by the National 4-H Council and the evaluation instrument was developed by researchers at the University of Nebraska at Lincoln. Students completed the survey after 10 hours of exposure to *HR!* curriculum. The data was aggregated by the Georgia 4-H state office and sent to the University of Nebraska at Lincoln for analysis. The researcher used the data to perform an independent analysis using PSAW 18 software to measure the evaluation tool against the stated objectives of the study.

Summary of Findings

Objective 1. Identify the level of participation in curriculum and activities of *Health Rocks!* program participants.

Of the 1,003 responses submitted to the researcher, 951 respondents reported participating in 10 or more hours of *HR!* programming. The baseline for evaluation completion, per the guidelines set forth by the University of Nebraska at Lincoln, was 10 hours of curriculum exposure, and this represented a 94.8% completion rate among the completed evaluations. From a standpoint of activity participation, all but one respondent reported participation in at least one activity related to the curriculum and a majority of respondents (n = 908, 90.5%) reported participation in 10 or more activities relating to the curriculum. There was no baseline for activity participation, but the numbers are encouraging from a standpoint of involving program participants.

According to numerous studies (NRC, 2001; Ennet, Tobler, Ringwalt, & Flewelling, 1994) engaging program participants in substance abuse education program curriculum is one of the most productive tools educators have for shaping attitudes in relation to controlled substances. The strong numbers reported, from an activity participation standpoint, are encouraging for the impacts of the *HR!* program, as there are no mandates for program presenters regarding how or when curriculum or activities will be presented or the mandates for participation. In the future, perhaps there should be some type of baseline mandate for activity participation, along with curriculum exposure. Because youth future behavior choices are strongly influenced by the level of participation in activities, mandating activity participation as part of the curriculum would be a strong inclusion into the programming (NRC, 2001; Ennet, Tobler, Ringwalt, & Flewelling, 1994). Perhaps there should also be a regression model

developed to determine an appropriate number of hours of curriculum instruction needed for a measureable attitude change.

Objective 2. Describe the respondents based on selected demographics of the 4-H Health Rocks! program participants who completed the survey instrument.

The data showed program participants to be 55.3% female and 44.4% male, with .3% not reporting. Those numbers are encouraging as they show a fairly balanced distribution of participants along gender lines, which is important for the program because it strives to change attitudes and perceptions among participants, as well as educate them so that they may be agents of change in their own communities and among their peers. If the numbers had been skewed to one particular gender, the possibility exists for a gender divide relative to that agent of change. Though females showed an 11% prevalence over males, in terms of participation, these numbers are encouraging for male participation in both 4-H and substance abuse education, though perhaps in the future, there could be an emphasis placed on recruitment of male program participants, particularly among Junior 4-H'ers, defined as middle school aged, where the influence of peer pressure is perhaps at the highest point (Fraenkel & Wallen, 2006).

In terms of age and grade, the data showed that the primary age range of participants was 9-14 years, representing 90.3% of respondents. That is the target demographic for 4-H participation with the heaviest participation occurring during middle school years. As stated in the previous paragraph, those years are particularly defined by peer pressure and the opportunity to positively influence middle school youth about substance abuse before they have been exposed to possible negative peer influences presents an opportunity to shape future attitudes and utilize the students themselves as agents of change. Research has shown that knowledge about controlled substances, as well as exposure to and usage of, increases exponentially during middle

school years up to early high school age (NRC, 2001; Stickle & Terranova, 2003). Influencing program participants' attitudes about substance abuse during the critical time before exposure and outside influence or knowledge transfer is critical for long term substance use avoidance (Ennet, Tober, Ringwalt, & Flewelling, 1994; NRC, 2001), and this program seems to use 4-H as an effective agent for capturing that audience.

When looking at grade levels of participants, the numbers match up with the ages for students in the corresponding grade ranges. The primary audience for the program was between the 4th and 7th grades, representing 87.5% of all respondents. As previously stated, this grade range represents the critical arena for education during the time that middle school students see an increase in substance abuse awareness and usage (NRC, 2001; Stickle & Terranova, 2003). Likewise, 8th grade and the transition to high school seem to be the critical tipping point when the largest increase in substance experimentation and usage occur (Stickle & Terranova, 2003). Targeting students before they enter into the 8th grade appears to be an effective time to mold their behavioral choices regarding substance usage. One troubling statistic is that 8th grade attendance was particularly low, with only 20 respondents, or roughly 2% of the population, representing the 8th grade. An increased emphasis on 8th grade attendance, to prepare students for the move to high school and young-adulthood, should be pursued in the future, particularly given the research regarding substance experimentation and exposure during the age correlating with 8th grade.

Racially, there was a tendency for participants to be Caucasian (60.2%) or African American (27.1%), which is fairly reflective of the racial make-up of the state of Georgia which has a 65% white, 30% African American population according to 2009 U.S. Census estimates (Georgia Quickfacts). A notable inclusion is the prevalence of respondents to identify themselves

as Hispanic, which was chosen 8.1% of the time. According to the same 2009 U.S. Census estimates, Georgia's population is roughly 7.5% Hispanic, and this is an encouraging number as it shows that the demographics of the program, racially speaking, are in line with the demographics of the state. Substance usage among youth is a problem for all racial groups and valid representation for the program is encouraging.

Geographically, there was a heavy tendency for respondents to hail from urban (64.7%) or suburban (29.6%) areas, which is somewhat surprising given 4-H's association with agricultural and rural lifestyle. According to Georgia Quickfacts (2009), U.S. Census estimates show well over half of Georgia's population lives in urban or suburban areas, but the numbers of people living in urban areas are not as large as shown in the *HR!* report. Though audiences and school sizes will certainly be larger for programs in urban or suburban areas, in the future it would be advantageous to put an emphasis on students in more rural areas, particularly given 4-H's appeal outside urban areas. The increase in drug usage among rural youth, particularly for highly addictive substances such as methamphetamine, presents an opportunity to reach an audience who may not have the resources for knowledge regarding substance abuse enjoyed by urban peers (NRC, 2001).

Objective 3. Analyze the survey instrument used by *Health Rocks!* to determine constructs and the reliability of items within constructs.

Data analysis revealed five constructs from the survey document, named by the researchers as actions, knowledge, beliefs/attitudes, skills, and general assets. A principle component analysis revealed the perceptions of the audience in terms of the questionnaire constructs. The actions construct showed the highest reliability, as well as the largest number of questions. A reliability coefficient of .926 suggests a high degree in correlation among the

questions and a strong perception among the audience that the questions were interrelated. The questions themselves centered on decisions relative to substance usage and life choices, and the strong perception among program participants and their answers is encouraging as it shows respondents perceived the questions to be interrelated, answered in a manner that was consistent with regard to their relation, and produced a question construct with a high degree of reliability.

The knowledge construct also shows a high degree of reliability .820 and an obvious pattern of relation. According to the principle component analysis, the respondents believed the questions formed a construct and from a visual analysis of the individual questions, they are perhaps the most closely related as all the questions in the construct contain references to consequences of drug usage. However, the omission of question 1.4 is a bit surprising, as it appears to be strongly linked to the other six questions in the construct. But the principle component analysis showed question 1.4 to have a very weak correlation to the other six questions and was found to reduce the reliability of the construct when included.

Though continued reinforcement of the negative consequences of drug usage alone has been shown to be less effective from a curriculum standpoint than engaging curriculum with involved activities, the researcher would like to see some type of baseline with regard to activities related to the consequences of substance usage in order to convey the negativities of drug usage (Ennet, Tobler, Ringwalt, & Flewelling, 1994; Saxe et. al., 2006). Question 1.4 states "Once you start using drugs, it is hard to stop," and is a message that needs to be strongly reinforced to curriculum audiences as a severe consequence of substance use. Perhaps a construct should be developed that addresses this.

The alpha coefficients for the beliefs/attitudes (.717) and skills (.722) constructs showed modest reliabilities, though not as strong as decision making and consequences. There exists,

upon reading the questions, the possibility of combining the constructs into one larger, nine question construct as both deal with being an agent of change. But when pairing the constructs together, the reliability coefficient decreases to .595, and when separated, we see a much stronger reliability coefficient for each individual construct. The lack of perception among respondents that the questions for the two constructs are not related suggests there could be more emphasis on the topic or the questions could be written differently to properly measure the phenomenon. The researcher would like to see, as a result of this, more emphasis placed on the agent of change concept of the program and see a higher degree of correlation between these constructs. Acting as an example is one of the greatest agents of change that may combat substance abuse, and with the increase in exposure among the targeted age group, being an example and educator are a very close relationship (Evans & Bosworth, 1997; NRC, 2001).

The final construct identified by the principle component analysis was the general assets construct with a .595 reliability coefficient which suggests the recognition of a weak correlation. Upon reading, these questions are seemingly strongly related as they all deal with influences upon an individual, such as television or friends. A particular omission, and one that negatively affects the reliability coefficient, is question 2.9, which states “My cultural background has a huge influence on me.” It would appear that respondents did not see a correlation between cultural background and other factors relating to influence, even though the word “influence” was included in the question. The researcher would recommend the omission of question 2.9 in future evaluations, and instead more emphasis on peer and media related influence. With regard to psychosocial models, there has been an assertion that cultural backgrounds have little to do with substance usage choices (Wilson & Kolander, 2011). Peer pressure is such a significant component in the lives and choices of the target audience for the *HR!* program, and an

understanding of peer pressure and what it could mean with regard to substance experimentation is particularly needed for this group (NRC, 2001, Stickle, Terranova, 2003).

Researchers at the University of Nebraska at Lincoln identified four constructs when they developed the *HR!* questionnaire, and upon correspondence with those evaluation developers, the researcher agreed with their constructs before analyzing the data. The constructs revealed by principle component analysis, and the omission of some questions from constructs, shows the difference in perception between researchers and program participants. This may be partially due to the manner in which the document was formatted for participants, as questions from the constructs, whether using the current study's five or the instrument developers' four, are sprinkled throughout the document. The researcher would like to see future iterations of the questionnaire contain less random placement of construct questions, though it must be noted that all the questions in the consequences construct appear together, including the omitted question 1.4, and the reliability was still not as strong as the larger decision making construct which had a much more random question placement.

Given the principle age range of the audience, the researcher would also like to see a more clearly defined structure for the post then pre component of the evaluation, meaning perhaps the placement of the pre questions on the left side of the page, with the question in the middle, and the post response to the right. The researcher believes this would be a format that aides to lessen the chances of response error due to confusion about which answer the respondent is supposed to mark. The researcher believes audiences would see more correlation between questions, particularly the education and example questions, if the questions were more closely grouped together and the columns more clearly separated (Israel, Diehl, & Galindo-Gonzalez, 2009).

Objective 4. Based on participant responses to the post then pre evaluation tool, determine if there was a change in knowledge, attitude, or behavioral intent.

The constructs that showed the largest difference in the mean pre and post response were the general assets and knowledge constructs. The mean response for the knowledge construct showed a movement from 3.37 to 3.63 (.26), and the change in mean for the general asset construct was .22. The general asset construct had the lowest reliability (.595) of the construct and the knowledge construct the second highest reliability (.820). The strength of the evidence regarding the difference in attitude or knowledge change among evaluation respondents was weakest for the belief/attitude construct at .11 and for the skill construct at .12, constructs the researcher believed show a strong correlation with regard to impact upon participants, though respondents didn't receive the questionnaire in that manner. The largest construct, actions, showed a .18 mean change in significance.

These figures show there was a change in attitude, knowledge level, or beliefs relating to substance abuse education and the results of the program may be viewed positively because of that. With substance abuse educational programs, there has been a tendency in the past to report false positives because of evaluations that showed statistically significant increases in knowledge or attitude toward drug usage. That may be attributed to the social stigma of drugs and respondents reporting what researchers want to see, or because this is what their friends choose on questionnaires. As previously stated, peer acceptance is a significant motivating factor among youth in the age group the *HR!* program targets, and "fitting in" with friends is important. As previously stated, with any questionnaire or evaluation tool the possibility exists for the instrument data to be invalid because of the presence of untruthfulness in respondents' answers. That possibility increases when the topic becomes something such as knowledge about and

attitudes toward substance abuse because of the social stigma attached (Rindskopf & Saxe, 1998). It thus becomes the job of program developers and administrators to create an honest, open environment for discussion wherein program participants can learn about substance abuse, the effects it may have on their life, and then respond in a manner about questions specific to the question to gauge changes in attitude and knowledge.

With regard to the evaluation tool, perhaps programmers might consider giving respondents multiple choice sheets and using an alternate mean of delivery for the questions themselves in order to lessen the opportunity for respondents to randomly answer questions in an effort to quickly finish the evaluation. By reading each question aloud and giving respondents the opportunity to choose their response, or by placing the questions one by one on an overhead projector, programmers may be able to garner more accurate data and further eliminate the potential for Type I or II error. The “Christmas Tree” effect of randomly selected examples may be even more prevalent given the format of summative evaluation, typically given at the end of a 4-H meeting with completion required so participants may leave.

Perhaps in the future, in order for the program to have a more uniform impact upon youth, developers should consider requiring a minimum number of activities. By implementing a mandatory number of activities, the door would be opened for the possibility of a uniform gain in knowledge regarding the health effects of substance usage. In addition, questions that are designed to measure the change in specific knowledge or the influence of specific activities, the more evaluators can learn about the knowledge level and attitudes of the audience. Questions that are too generic are more likely to measure predispositions or inherent knowledge (Howard & Dailey, 1979; Linn & Slinde, 1977). Specific questions relating to the health effects and addictive nature of controlled substances, as well as the effects upon life, family, and

productivity, could be addressed on the evaluation sheet to gauge the difference in attitudes and knowledge from before curriculum exposure and after (Linn & Slinde, 1977). The nature of the post then pre evaluation tool lends itself to curriculum specific questions and then using the evaluation tool to make curriculum improvements based on the knowledge or attitude change of participants (Miller, 1998; Linn & Slinde, 1977).

Practical Implications

Utilizing the post then pre format to make curriculum recommendations leads down an avenue not addressed in this study, that being the curriculum itself. With regard to the curriculum and activities, it would be advantageous to see more of a standardized list of what was to be presented, when it was to be presented, and what accompanying activities went along with specific lessons. Also, some type of standardization with regard to format for presentation (i.e., will the program be administered over the course of several weeks or as a weekend camp) would be advantageous for curriculum and activity development.

By standardizing the processes, adding a baseline for activity participation, and utilizing the post then pre document to measure targeted areas of change related to curriculum specific questions, program developers have the opportunity to move *HR!* from an effective program to a premier substance abuse educational tool. Past researchers have also noted that according to social ecology theory, when audiences are familiar with the educators, yet the educators remain in a position of influence such as a 4-H leader or football coach, the effects of the curriculum are more likely to be taken as advice that is advantageous to listen to because it comes from people who are important to the audience and whom the audience does not want to disappoint because of their familiarity with (Brody, 1975). The influence of peer pressure is also something that should be noted when dealing with program audiences in this particular age group, and the

possibility of quantifying the degree of peer pressure an individual feels could provide interesting data regarding attitude and perception of drug usage among the perceived norm in the Theory of Planned Behavior.

The practical implications of the study are as follows:

- The National 4-H Council and Georgia 4-H Health Rocks! program showed change on the evaluation tool and produced positive impacts upon program participants regarding attitudes and knowledge about drug and controlled substance usage.
- The program represented the demographics of the state of Georgia very well.

Program developers and administrators should:

- Mandate baseline requirements for activity participation and curriculum exposure as activity participation and engagement are essential for effective substance abuse education
- Standardize format for curriculum delivery
- Measure the level of intensity with which a teen feels pressure from peers along a scale and use this as a quantitative variable
- Develop an instrument that contains questions more specific to the curriculum that call upon a more advanced knowledge base to truly compare post then pre knowledge and attitudes.

Implications for Future Research

This study utilized a post then pre evaluation tool, popular in Cooperative Extension, to measure the changes of program participants from their pre curriculum exposure knowledge and attitudes to their post curriculum exposure knowledge and attitudes. The researcher believes that is a valid and acceptable form of evaluation for a program such as this. Problems arise because of

the generic nature of the questions, the lack of standardization of curriculum delivery, and the absence of a baseline for activity participation for program participants. Past studies have shown that activity participation among substance abuse program participants is a strong predictor of change in attitude and knowledge retention, and questions calling upon specific curriculum knowledge in a post-then-pre form are an effective evaluation form (NRC, 2001; Linn & Slinde, 1977; Rindskopf & Saxe, 1998). For future research, examining the changes in respondents' answers with a baseline for activity participation and more specific questions calling upon a high level of knowledge conveyed via the curriculum, and comparing the respondents' changes in this type of study to the present evaluation might reveal areas for curriculum or activities to target.

Another area that has been shown to have an effect on youth and substance usage or awareness is age and grade level. Targeting a longitudinal study to show the differences in attitudes and knowledge levels among participants from their early middle school grades, possibly 5th grade, to the time they finish the 8th grade could potentially give researchers a valuable tool to create future curriculum and use the students themselves as agents of change, given the nature of peer pressure in this age range. Because of the increase in knowledge and substance awareness among these youth their participation is the most needed in terms of audience impact (Fowler, Rich, & Young, 1986; NRC, 2001; Stickle & Terranova, 2003). Adhering to the psychosocial approach to education, programmers seek to develop skills of decision making and cognition to resistance of peer pressure while attempting to increase self awareness and esteem, all of which fits very well into this curriculum (Wilson & Kolander, 2011). By following an audience as they progress through middle school and measuring the changes in attitudes toward, knowledge about, and exposure to drugs and controlled substances, there exists an opportunity to create a powerful program with targeted curriculum that addresses

the increases in knowledge and exposure to controlled substances participants experience during their middle school years.

In the absence of a longitudinal study, if future programmers wish to follow psychosocial theory or the theory of planned behavior, perhaps the mandated activities should focus upon assertiveness and refusal, building self awareness and esteem, and the negative consequences of substance usage as supported by social ecology theory. Comparative studies focused on the changes in attitude from before and after curriculum exposure, calling specifically upon elements of the curriculum dealing with self awareness and assertiveness, have the potential to be a predictor of behavioral choices. No matter the theory base of researchers, incorporating an understanding of peer pressure and the changes program participants realize during middle school with regard to knowledge levels and exposure to controlled substances presents a broad opportunity to create change in attitudes toward substance usage as well as create agents of change within these youth communities.

As stated in Chapter 2 in the statement of the problem, to truly measure the effectiveness of a program, the evaluation must then be reflective of the curriculum and address specific issues contained in the program to gauge what the impacts of program were (Linn & Slinde, 1977; Kohn & Rockwell, 1989). It isn't merely enough, as illustrated in the example above, to ask about the participants' attitudes toward cigarette smoking using a post then pre evaluation form. To gauge the true impact of the program, the section dealing with tobacco usage must be more specific to the curriculum and the questions should center around the effects of tobacco on the lungs to gauge the level of knowledge the participant had prior to curriculum exposure (pre) and compare it to the level of knowledge gained or change in attitude after curriculum exposure (post). By employing this behavioral measurement approach to target areas of impact, engaging

the learner in the pursuit of knowledge in those areas of impact, and then formulating our evaluation tool consisting of sections that focus on those specific ideas within the curriculum, we can then use the post then pre summative evaluation to measure change in attitude toward tobacco, alcohol, or drug abuse and compare the impacts against program objectives (Linn & Slinde, 1977; Kohn & Rockwell, 1989; Ennet, Tober, Ringwalt, & Flewelling, 1994; Rindskopf & Saxe, 1998). Producing a change in attitudes toward substance abuse that is profound enough to impact the life of the program participant remains the key challenge of substance abuse educators and program developers (NRC, 2001; Ennet, Tober, Ringwalt, & Flewelling, 1994; Rindskopf & Saxe, 1998).

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APPENDICES

Evaluation Document

Health Rocks!®

Your participation in this survey is voluntary. It will take about 15-20 minutes. *Part I* asks about your experience with *Health Rocks!*. *Part II* will ask you about how you feel about the training. *Part III* will ask you to share anything else you would like to tell us about your *Health Rocks! experience. Part IV* will ask for some information about you (e.g., age, gender, etc.). Because we do not ask for your name, no one will know what your answers are.

I. *The following survey is on a 4-point scale. Read each statement and circle the number that best represents your knowledge or experience:*

1) **NOW** - *at the present time after having completed Health Rocks! training.*

2) **Before *Health Rocks!* -** *before your participation in Health Rocks! training.*

strongly disagree	**disagree**	**agree**	**strongly agree**
1	2	3	4

I believe that	**NOW (After *Health Rocks!*)**	**Before *Health Rocks!***
	1 2 3 4	1 2 3 4
1. Most young people like me do not use drugs.		
	1 2 3 4	1 2 3 4
2. How I feel can affect what I do.		
	1 2 3 4	1 2 3 4
3. Drinking or using drugs can lead to car accidents that could kill or harm myself and others.		
	1 2 3 4	1 2 3 4
4. Once you start using drugs, it is hard to stop.		
	1 2 3 4	1 2 3 4
5. Using drugs can destroy my relationships with my family and friends.		
	1 2 3 4	1 2 3 4

6. People who use drugs sometimes see or hear things that are not really there.

1 2 3 4 1 2 3 4

7. Misuse of alcohol can cause people to forget things.

1 2 3 4 1 2 3 4

8. People who smoke can die from lung cancer.

1 2 3 4 1 2 3 4

9. People who use drugs are more likely to hurt or be hurt by others.

strongly disagree **disagree** **agree** **strongly agree**
1 2 3 4

1 2 3 4 ***I believe that*** **NOW (After *Health Rocks!*)** **Before *Health Rocks!***

1 2 3 4 1 2 3 4

1. It is not worth taking the risk to try cigarettes, alcohol and other drugs.

1 2 3 4 1 2 3 4

2. Managing stress in a positive way is important.

1 2 3 4 1 2 3 4

3. I have goals for myself.

1 2 3 4 1 2 3 4

4. If one of my friends was using drugs, I should try to help him or her stop.

1 2 3 4 1 2 3 4

5. If a friend asked me to try cigarettes, alcohol or drugs, it would be **hard** for me to say NO.

1 2 3 4 1 2 3 4

6. Stress can sometimes make me work harder.

	1 2 3 4	1 2 3 4
7. Trying drugs just once is not a big deal.		
	1 2 3 4	1 2 3 4
8. People are influenced by TV even without knowing it.		
	1 2 3 4	1 2 3 4
9. My cultural background has a huge influence on me.		
	1 2 3 4	1 2 3 4
10. Having a healthy life is important to me.		

strongly disagree **disagree** **agree** **strongly agree**
1 2 3 4

1 2 3 4 ***I believe that***	**NOW (After *Health Rocks!*)**	**Before *Health Rocks!***
	1 2 3 4	1 2 3 4
1. I can make positive decisions.		
	1 2 3 4	1 2 3 4
2. If a friend wanted to try drugs, I can talk them out of it.		
	1 2 3 4	1 2 3 4
3. I am able to choose healthy behaviors to deal with stress.		
	1 2 3 4	1 2 3 4
4. Using drugs is not a way to deal with stress.		
	1 2 3 4	1 2 3 4
5. I can gather information before making decisions.		
	1 2 3 4	1 2 3 4
6. When I feel stressed I am able to talk about it with people I trust.		
	1 2 3 4	1 2 3 4

7. I will never be hooked on drugs.

1 2 3 4 1 2 3 4

8. I am able to say “no” if someone offered me drugs.

1 2 3 4 1 2 3 4

9. I am able to tell when TV or other kinds of ads influence my decisions.

strongly disagree **disagree** **agree** **strongly agree**
1 2 3 4

1 2 3 4 ***In general…..*** **NOW (After *Health Rocks!*)** **Before *Health Rocks!***

1 2 3 4 1 2 3 4

1. It is important for me to help others in the community.

1 2 3 4 1 2 3 4

2. I don’t have to drink or smoke even if some other young people do it.

1 2 3 4 1 2 3 4

3. It is important for me to stay focused on learning at school.

1 2 3 4 1 2 3 4

4. It is important for me to stand up for what I believe.

1 2 3 4 1 2 3 4

5. Before making a decision, I need to think about how my choices will affect my future.

1 2 3 4 1 2 3 4

6. I can achieve most of the goals I have for myself.

1 2 3 4 1 2 3 4

7. I feel good about myself.

1 2 3 4 1 2 3 4

8. I would help other kids like

me to stay away from alcohol
or other drugs.

II. Please *read each statement and circle the number that best represents your experience and satisfaction.*

strongly disagree	**disagree**	**agree**	**strongly agree**
1	2	3	4

1 2 3 4

1 The training was interesting.

1 2 3 4

2 The staff members were friendly.

1 2 3 4

3 I learned a lot during the training.

1 2 3 4

4 I actively participated in training activities.

IV. *Place a check (√) next to the answer that describes you.*
1. You are a: _____ Girl _____ Boy

2. How old are you: _____
3. Grade: _____ 4th or lower
_____ 5th
_____ 6th
_____ 7th
_____ 8th
_____ 9th
_____ 10th or higher
4. Race: _____ Caucasian
_____ African American/Black
_____ Native American
_____ Asian
_____ Multi-Racial
_____ Unknown
5. Ethnicity: _____ Hispanic/Latino _____ Not Hispanic/Latino
6. Size of your town/city (your best guess or ask program staff if you are not sure):
_____ Urban (population over 50,000)
_____ Suburban (population 10,000 – 50,000)
_____ Rural (population less than 10,000)
7. Where did you participate in the *Health Rocks!* training?
State _____ County _____
8. Around how many hours of *Health Rocks!* training have you completed? _____
9. How many activities have you completed? _____ number of activities

Informed Consent Form

INFORMED CONSENT FORM

Evaluation Plan for Program Outputs/Outcomes of *Health Rocks!*

Purpose of the Evaluation Plan:

This evaluation plan for *Health Rocks!* is to measure implementation outputs and the degree to which youth participants achieve the learning objectives and expected outcomes of *Health Rocks!* Curriculum implementation. Specifically, this evaluation will assess participants' increased knowledge, changes in beliefs and attitudes, and increased skills and self-reported confidence in using positive behaviors targeted by each module after participating in *Health Rocks!* intermediate level curriculum.

Procedures:

A survey method with retrospective measures will be used to assess the increased knowledge, skills and potential for positive behaviors after youth participate in the *Health Rocks!* intermediate level program. The retrospective survey (post-then-pre method of evaluation), measures program impact by asking questions regarding knowledge, attitude, skill and/or behaviors at the present time and then asking participants to report what the knowledge, attitude, skill and/or behavior were previously. Participants will be given space to provide suggestions and comments. The survey mainly consists of fifty-four 4-point scale questions. It will take approximately 15-20 minutes to complete the survey.

Risks and Benefits:

There are no known risks or discomforts associated with this research. If your child feels uncomfortable with some questions in the questionnaire, he or she can stop at any time. There are no direct benefits to participation in this evaluation project. Hopefully, it may help your child to evaluate themselves what they have attained from *Health Rocks!*training.

Confidentiality:

No identifying information will be collected in this project. The data will be stored in a locked cabinet in principle investigators' offices. Only Dr. Yan Ruth Xia, Dr. Maria De Guzman and the research assistants can access the data. The results obtained from this study may be used for writing reports, scientific journals, or presented at scientific meetings. All the data files will be destroyed within the five years after the research project completes.

Compensation:

There is no compensation in this evaluation project.

Opportunity to Ask Questions:

If you have any questions about the questionnaire, you can ask any questions concerning this evaluation project and have those questions answered before agreeing to participate in or during the study. You can contact Dr. Yan Ruth Xia through email yxia@mail.unomaha.edu or through phone (402) 554-3259, Dr. Maria De Guzman through email mguzman2@unl.edu or through phone (402) 472-9154. If you have questions concerning your child's rights as a research subject that have not been answered by the investigator or to report any concerns about the study, you many contact the University of Nebraska-Lincoln Institutional Review Board, telephone (402) 472-6965.

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COLLEGE OF EDUCATION AND HUMAN SCIENCES
Department of Child, Youth and Family

Freedom to Withdraw:
You and your child are free to decide whether or not your adolescents will be participating in this study. Your child may also end their participations at any time without negatively affecting them or your relationship with the teen leaders and training leaders. Your decision will not result in any loss of benefits to which you are otherwise entitled.

DOCUMENTATION OF INFORMED CONSENT

You are voluntarily making a decision whether your child wishes to participate in this research project. Your signature certifies that you have decided to participate having read and understood the information presented. You will be given a copy of this consent form to keep.
Name (Print)_____

_____ _____
Your Signature Date

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