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# The Effects of Parental Modeling on the Health-Related Behaviors of American Indian Adolescents: A Culturally Specific Investigation of Social Learning Theory

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THE EFFECTS OF PARENTAL MODELING ON THE HEALTH RELATED

BEHAVIORS OF AMERICAN INDIAN ADOLESCENTS: A

CULTURALLY SPECIFIC INVESTIGATION OF

SOCIAL LEARNING THEORY

by

Amy Jo Williams

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# ABSTRACT

The Effects of Parental Modeling on the Health Related Behaviors

of American Indian Adolescents: A Culturally Specific

Investigation of Social Learning Theory

by

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Utah State University, 2001

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Health-compromising behavior is a leading cause of death among

American Indian (AI) adolescents. Examples of these behaviors include:

smoking, alcohol consumption, drug use, and lack of seatbelt use. Theories that

predict which AI youth are most at risk for executing these behaviors are needed.

Social learning theory (SLT) has shown adolescents' behaviors are

sometimes highly correlated with their parents' behaviors across different ethnic

groups. However, there has been little previous research done with AIs.

The present study attempted to determine if SLT was applicable to AI

adolescents and their parents with regard to four health-related behaviors:

cigarette smoking, alcohol consumption, seatbelt use, and religiosity. The first

three were chosen because of the high number of AI adolescent deaths

associated with them. Religiosity was included because high religiosity scores have been shown to negatively correlate with health-compromising behaviors in some studies. The present study provided partial support for SLT when applied to AI youth. For example, there were positive correlations found between parents' smoking and if the youths have ever smoked regularly or smoke currently.

Little support was found for SLT with regard to alcohol consumption (i.e., the overall correlation was not significant). The exception to this was when daughters were correlated with fathers. How often the father drank and if he binged were positively correlated with how often the daughter drank and if she ever binged. There were strong correlations between parents' seatbelt use and similar use of their adolescents, thus supporting the theory. Also, strong positive correlations were found between the religiosity of the parents' and the youth. Further, religiosity did show negative correlations with health-compromising behaviors among the youth. There was also a sex difference found, with female youth having stronger negative correlations than the male youth.

There were 290 AI adolescents in this nationally representative sample, 136 male and 154 female. All the behaviors were measured via self-report, as was the identification of the adolescent's ethnicity.

Limitations of this research, implications for future research, and areas for prevention/intervention with AI youth at risk are discussed.

(98 pages)

# DEDICATION

This thesis is dedicated to my family, and to my son especially. He has taught me more about the importance of being a role model than any research finding or journal article.

This is also dedicated to my Grandpa "Jim." May he now walk happily.

# ACKNOWLEDGMENTS

My gratitude goes to my major professor, Dr. Kevin Masters, for his support and guidance during this process, and also to my committee members, Drs. Carolyn Barcus and Brent Miller. Thanks to Dr. Barcus for supporting my interest in American Indian studies and not letting me get away with anything, and to Dr. Miller for helping me sort through the mounds of available data to find what I needed.

My thanks also go to Dr. Xitao Fan for his numerous explanations of the necessary statistics, and to Drs. Jim Barta and Carl Cheney for their input regarding my proposal.

I must also thank my parents for not laughing when I said I wanted to go to graduate school in psychology. Their support and knowledge of psychology has helped smooth my path on many occasions.

Finally, my eternal gratitude goes to my wife and son. They have given up many hours of their lives to actively help me with my studies or to wait patiently until they could see me again without a book in my hand. They are the only reason I am still in school and have finished this project. I love you both and can not thank you enough.

<div align="right">Amy Jo Williams</div>

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CHAPTER I

INTRODUCTION

Many studies have focused on the health of adolescents in America. Some of them have focused on risk-taking and health-compromising behavior (HCB; e.g., Adger, 1991; Neumark-Sztainer et al., 1996), while others have attempted to determine what factors increase healthy behaviors and resiliency (e.g., Jessor, Turbin, & Costa, 1998; Resnick, Harris, & Blum, 1993). The majority of these studies focused specifically on one aspect of adolescent behavior at a time. Some of the more common HCBs studied among this age group include: alcohol and drug use/abuse (e.g., Adger, 1991; Clapper, Martin, & Clifford, 1994), cigarette smoking (e.g., Gordon, 1986), perpetration of domestic and gang violence (e.g., Sigler, 1995), precocious or risky (unprotected) sexual activity (e.g., Balassone, 1991; Miller et al., 1997), dropping out of school (e.g., Blum & Jones, 1993), and unintentional injury (e.g., Yee et al., 1995). Further research has focused on defining which adolescents are at risk for engaging in unhealthy behaviors (Tyler & Lichtenstein, 1997), and what types of intervention would be most effective with at-risk youth (e.g., Diem, 1992; Hritz & Gabow, 1997). Much of the research that attempts to identify which youths are most at risk include multicultural samples of adolescents (e.g., Johnston, Bachman, & O'Malley, 1986; Neumark-Sztainer et al., 1996). In studies that include them, without exception, American Indian youth are at the top of the list for being most

likely to engage in HCBs (e.g., Bachman et al., 1991; Myers, Kagawa-Singer, Kumanyika, Lex, & Markides, 1995).

Myriad studies have documented the current health crisis among American Indian youth. They illuminate the fact that the incidence of drug use, alcohol use, suicide, accidental injury or death, unemployment, poverty, and school drop-out rates are much higher among American Indian youth than are found in the United States population as a whole and, in most cases, above their peers of other minorities (e.g., Bachman et al., 1991; Beauvais, 1992a; Bechtold, 1994; Thurman & Green, 1997). In addition to these problems, American Indians also have the highest death rate due to Type 2 Diabetes Mellitus per capita than any other ethnic group in the U.S. (Pine, 1988). Morbid obesity, cancer, and coronary disease are also overly prevalent in the American Indian community as compared to all races in the U.S. (Taylor, Denny, & Freeman, 1999). Also, the diagnosis of new AIDS cases is disproportionately higher among American Indians than among Anglo-Americans (Fisher, Cagle, & Wilson, 1993).

Not only are these HCBs and findings of ill health prevalent, but they are also severe. Studies have shown that the way in which American Indians drink (i.e., drinking to excess and drinking more frequently) and use drugs places them in greater danger of accidents and violence than their peers from other ethnic groups (Beauvais, 1992b). In addition, research is beginning to show that American Indians may not judge certain behaviors to be as risky as they really

are, or they may not judge their personal risk to be very high (Lightdale, Oken,

Klein, Landrigan, & Welty, 1997; Sigelman, Didjurgis, Marshall, Vargas, &

Stewart, 1992).

Much energy and research has gone into developing prevention and

intervention programs designed to ameliorate the health crises faced by

American Indian adolescents. Many of these programs have been inadequately

researched, unsuccessfully established, or not implemented at all due to lack of

funding and occasional misunderstandings between the American Indians and

outsiders trying to "fix" their problems (Yellowthunder, 1981). It has been

suggested that before a program can be successfully established, research must

be done into the etiology of the situation (Herring, 1994). Furthermore, this

research must be culturally relevant to American Indians.

Today American Indian adolescents are obviously stuck in a cycle of ill

health and poverty that is being passed from generation to generation.

Therefore, research focusing on the development and continuation of their

health-related behavior is warranted. One theory that focuses on the etiology of

HCBs, and has gathered much attention and support over the years is social

learning theory (SLT; Bandura, 1977). According to this theory, specific

behaviors are learned by casual or directed observations of the behavior of

others and the consequences those behaviors bring. Briefly stated, Bandura's

SLT proposes that young children's learning is dependent upon the behavioral

modeling that pervades their lives. Children do not, however, engage in every

behavior they observe. Certain factors make performing the behavior more likely. For instance, if the perceived consequences of the behavior are favorable, the youth is more likely to attempt the behavior. Conversely, if the consequences are negative, the chances of the youth engaging in the behavior decrease (Bandura, 1977). Further, when the behavioral model is perceived as having high status, competence, and power, and if the model is readily available, replicating the behavior by a youth is more likely than when the model is not frequently available or is perceived to be of lower status, competence, and power than the youth (Foshee, Bauman, & Linder, 1999). Parents, peers, teachers, coaches, mentors, extended family members, prominent media figures, religious leaders, and other adults present in a youth's life are all considered viable role models.

Parents as role models will be the focus of this study. The reasons for this include that parents (or other primary caregivers) are often seen by youths as having more status and power than they have. Also, parents are a readily available model of both behaviors and the consequences of those behaviors (Foshee et al., 1999). Finally, there is evidence to support the idea that behavior of American Indian youth is influenced more by family than by peers (Ma, Toubeth, Cline, & Chisholm, 1998; Swaim, Oetting, Thurman, Beauvais, & Edwards, 1993).

CHAPTER II

REVIEW OF THE LITERATURE

Literature Search

The search for the articles reviewed in this study used the material found on the *PsycLit*, *Sociological Abstracts*, *Social Science Abstracts*, and *ERIC* databases for the years spanning 1977-1999. The following key words and phrases were used in the search: American Indian, Native American, minority, youth, adolescents, adolescence, health, health-compromising behavior, health-promoting behavior, alcohol, smoking, religiosity, seat belt use, social learning theory, modeling, and parents as role models. Research studies were also obtained through references given in primary and secondary sources. Articles chosen for inclusion in this study focused on SLT, especially as it applies to the correlation between parents' health-related behaviors and the health-related behaviors of their adolescent children.

Health-Compromising and Health-Promoting Behavior

Based on information provided by previous studies of health-related topics, for the purposes of this research health-compromising behavior is defined as any behavior that will increase the likelihood of a person being killed, injured, or diagnosed with a chronic disease. Examples of these behaviors include such things as smoking; drinking; using illegal drugs; driving or riding in a car without a

seat belt; riding on a bicycle or motorcycle without a helmet; eating a high fat, low fiber diet; living a sedentary lifestyle; not visiting a doctor or dentist regularly; attempting suicide; skipping school or dropping out of school; engaging in risky sexual activity; engaging in delinquent acts; or associating with others who engage in HCB. Health-promoting behavior, on the other hand, is defined as any behavior that will decrease the likelihood of a person being killed, injured, or diagnosed with a chronic disease. Some examples of these behaviors include: abstinence from illegal drugs, alcohol, tobacco, and unprotected sex; engaging in routine visits with a doctor and dentist; consistently wearing a seat belt and helmet; eating a diet high in fiber and low in fat and simple carbohydrates; attending school regularly; consistent religious participation; exercising regularly; and associating with others who engage in, and encourage the continuation of, these healthy behaviors.

## Social Learning Theory

Many psychological theories have been proposed to explain and predict human behavior. Some theories have been more successful than others. Psychodynamic theories, for example, focus exclusively on internal motives and drives to explain behavior. These theories are relatively weak at predicting or changing behavior and are also surprisingly poor at predicting what drives and motives one is experiencing at any given time (Marmor, 1962; Rachman, 1971). As a reaction to the psychodynamic approach, behavior theory was developed in

order to more accurately alter and predict behavior. Strict behaviorism focuses only on observable behaviors, to the exclusion of any internal drives or cognitive processes. However, this theory too was shown to be limited in its predictive abilities. Studies have shown that certain behaviors are inconsistent across settings, even when the same stimuli are applied (Bem & Allen, 1974; Heyman, 1983; Mischel, 1968).

In response to the limitations of both psychodynamic theories, which focus only on internal process, and behavioral theories, which focus exclusively on overt behavior, Bandura (1977) developed social learning theory (SLT). Social learning theory includes both cognitive and behavioral components combined with socialization aspects to explain a person's behavior. According to Bandura, psychological functioning is a continuous reciprocal process between an individual's inner cognitions and emotions and external stimuli. Bandura expanded this view by stating that a vast amount of human learning takes place vicariously, by watching others' behaviors, and noticing what reinforcements or consequences those behaviors earn.

Social learning theory purports that observing models of behavior is one of the best predictors of the behaviors of the observers. Modeling behavior is an especially important tool for children who are learning how to live in their social environment. If children had to learn everything themselves based solely on reinforcements and punishments, they would accomplish little and might unintentionally be injured. Therefore, Bandura stated that children watch the

behavior of models around them and also notice what reinforcements those models receive. As the children grow and gain more physical and cognitive abilities, they begin to experiment with the behaviors previously modeled for them. Also as children age, make friends, go to school and other social functions, the number of models available to them increases.

By the time children reach adolescence, they have seen thousands of models, and witnessed many more behaviors and their consequences. This leads to another aspect of SLT which indicates youth are able to aggregate these viewed behaviors and reinforcements across time. This helps them judge whether or not they think they will get reinforcements for engaging in the behavior. Adolescents' cognitive and physical abilities are nearly that of an adult, and they have greater freedom to explore and associate with nonfamily members than they had when they were younger. Some researchers state that this exploration and association with peer models who offer reinforcement for negative behaviors often lead youths to engage in various HCBs (Jessor & Jessor, 1977). According to SLT, the likelihood of adolescents engaging in risky behavior is increased when these children have witnessed their own parents perform the behaviors and, therefore, expect some reinforcement for the behaviors (Bandura, 1977; Jessor & Jessor, 1977). Additionally, further research implies that role models (parents, peers, or mentors) who are ethnically similar to the one observing the behavior increases the likelihood that the modeled behavior will be imitated (e.g., Kalbfleisch & Davies, 1991; Williams, 1998).

Since SLT was proposed in the 1970s, many studies have been conducted on its ability to predict behavior. Studies focusing on SLT have specifically looked at modeling as a viable way to teach behaviors, and studies have looked at the correlations between children's behavior and that of their adult and peer role models. Support for SLT has been plentiful over the past two decades. The relevant articles found which investigate SLT and the health-related behaviors of parents' and their adolescents' will now be reviewed.

## Findings Regarding SLT and Alcohol Use

Studies focusing on the drinking behavior of adolescents and young adults have provided support for SLT. For example, Standing and Nicholson (1989) conducted a cross-sectional study of students on a college campus, and they found that drinking behavior during the first two years was highly correlated with the drinking behavior of parents. After those two years, the students' drinking behavior correlated most highly with their peers' drinking but still had a moderate correlation to their parents' behavior. A study investigating social factors influencing alcohol use among inner-city minority students (Epstein, Botvin, Diaz, & Schinke, 1995) found that youths who had a role-model that drank increased the likelihood that those adolescents planned to drink in the future. Epstein et al. also found that role models who do not drink may provide a positive influence on youth and reduce their drinking behavior. In addition, these researchers found

that most adolescents may actually get their first drink of alcohol from their parents.

Further studies that investigated the correlation between parental and adolescent behavior have found that parental modeling of alcohol use is a reliable predictor of adolescent alcohol use. For example, Barnes and Welte (1990) reported that if either parent was a heavy drinker, adolescents were much more likely to be heavy drinkers themselves, as opposed to those adolescents whose parents were abstainers. Similar studies have found that parental alcohol consumption influenced the alcohol consumption of adolescent children (Casswell, Stewart, Connolly, & Silva, 1991), and that drinking behaviors (e.g., amount consumed in one sitting and drinking frequency) are acquired from parental models (e.g., Barnes, Farrell, & Cairns, 1986).

Conversely, in a study of late adolescents' alcohol use, Clapper et al. (1994) found that peer alcohol use was a better predictor of the target adolescents' use than parents' use of alcohol. However, they found that parental alcohol use, personality, and previous behavior were all significant predictors of late adolescent alcohol use. It should be noted that they did not include young adolescents in their study (i.e., younger that 17 years old).

A longitudinal study by Ary, Tildesley, Hops, and Andrews (1993) found that parental modeling of drinking behavior did not affect concurrent use in their children, but parent modeling of alcohol use was predictive of later alcohol use by these adolescents. Further, the findings in that study indicated that parental

attitudes toward adolescent alcohol use were also predictive of later use by their children. This finding was especially noticeable with parents who were strongly opposed to adolescent alcohol use. Children of these parents had low levels of self-reported concurrent alcohol use and continued to have low levels of use one year later.

In summary, the findings regarding the best predictor of adolescent alcohol use are mixed. Some studies show that peer alcohol use is more predictive, while others show parental use is more predictive in the long term. Nevertheless, both are important predictors. Studies also note that personality and a preference for peers who share the same values towards alcohol consumption may all contribute to adolescent alcohol use.

## Findings Regarding SLT and Smoking Behavior

Comparable findings to those found with drinking behavior have been reported concerning adolescent smoking behavior. Akers and Lee (1996) found that adolescents were more likely to smoke, and smoke more frequently, when they associated with others that smoked and held favorable attitudes toward smoking. Additionally, these authors stated that the youths' smoking behaviors were also affected by their anticipated positive or negative outcomes of smoking, their positive definitions of smoking, and their opportunity to imitate the smoking behavior. Meier (1991) found that when mothers smoked, their children had significantly less negative attitudes toward smoking (this was not found when

fathers smoked). She also reported that smoking behavior of siblings may have an even greater impact on the youths' attitudes toward smoking than the smoking behavior of their parents.

Similar findings were obtained by a 10-year longitudinal study done in Oslo, Norway (Øygard, Klepp, Tell, & Vellar, 1995). The authors of this study concluded that siblings, peers, and parents all influenced the smoking behavior of adolescents. However, they also found that the influence of siblings' and peers' smoking behavior declined by age over time, while the mother's smoking status emerged as the strongest long-term predictor of smoking behavior by adolescents. Mother's smoking was also found to be the only significant predictor of adolescents who moved from nonsmoking status in 1979 to being an adult regular smoker (i.e., at least one cigarette a day) in 1989. Also of note in this study is the finding that smoking by friends in 1979 was not predictive of adult smoking in 1989 by the adolescent studied.

Epstein, Botvin, and Diaz (1999) found that mothers' and friends' smoking status influenced the smoking status of inner-city youths one year after the initial interview. There was no indicated influence from the father's smoking status or the smoking of siblings. These authors added that teaching the adolescent to resist social influences may be an important intervention technique.

Morgan and Grube (1994) found that smoking by older adolescents (over age 16) was most highly correlated with the smoking status of their best friends. The smoking status of other good friends was also correlated but not as highly,

and there was no peer influence on smoking behavior among younger adolescents. Also, these authors reported that educational programs designed to teach adolescents about the health risks involved with smoking have not lowered the number of new smokers over the years. Based on their findings, Morgan and Grube have hypothesized that during late adolescence "looking cool" and "fitting in" are more important than at any other time in a child's life, and this explains why friends' smoking is so influential during this period. However, these authors add that parental smoking influences are present and constant over the entire range of the adolescent years and are predictive of later use by adolescents.

Wang, Fitzhugh, Eddy, Quiang, and Turner (1997) also investigated social influences on adolescents' smoking. Their longitudinal study of U.S. teenagers focused on the influences of peers, parents, and siblings on adolescents' smoking progression (i.e., never tried, to trying cigarettes, to regular smoker, to addictive smoking). Findings were mixed with regard to SLT as it applies to adolescent smoking behavior; the only social factor that consistently predicted adolescent smoking was the smoking status of their best friends. The authors were loath to claim that this was supportive of SLT, because of research that suggests peer influence on smoking is largely a result of smoking adolescents choosing peers who also smoke. Further, these authors discovered no support that a parent's or a sibling's smoking status affected the smoking status of target youth, or the progression of youth smoking.

As these studies indicate, there are diverse findings regarding whether parental or peer modeling is more influential on the behavior of adolescents. This will be addressed further in the literature review section discussing problems found with the research. Generally, findings from the research support the idea that parents have more influence on the lifelong behaviors of their offspring and on the behaviors of their young children, whereas peers have more influence on the behaviors of adolescents during the late teenage years. Additionally, when the parent is the primary influence, the behavior of the mother seems to be more influential than the father's behavior.

## Findings Regarding SLT and Seat Belt Use

Sleet, Hollenbach, and Hovell (1986) applied behavioral principles to seat belt use. One of the major principles studied was modeling behavior. Modeling without any further instruction, physical demonstration of proper use, and the subsequent imitation of this behavior were all studied and are all key components of SLT. When Sleet et al. focused on peers modeling proper safety techniques to parents who were unsure how to use the safety restraints properly, they found that safety belt use and the proper use of child safety seats can be learned through the process of modeling. Additionally, they reported that children learn how and when to use a seat belt by watching the modeled behavior of adults in the car.

A study by Howell, Owen, and Nocks (1990) investigated whether

modeling of seat belt use would affect the seat belt use of passengers. They found that when a confederate peer model (driving the car and unknown to the subjects) used a seat belt, 77.4% of the subjects used one, but when the driver did not use a safety belt, only 31.3% of the passengers used theirs. The researchers concluded that this investigation provides support for SLT in that modeled seat belt use increased the seat belt use of passengers. Further, post hoc data were collected from the subjects regarding their usual seat belt use. It was concluded that modeled nonuse decreased the usual use of seat belts by the passengers when compared to their reported normal use.

A similar study was done by Nocks and Howell (1993) regarding modeled seat belt use or nonuse of an unknown peer driver. However, they included another condition consisting of whether or not a directive sign was present in the car, which read "Fasten Seat Belts." The results from this study replicate those found in the previous study. In addition, however, when the model did not use her seat belt with the sign present, nonuse of the seat belt by the passenger was even lower than when the sign was not present and nonuse was modeled. Along with these findings, Nocks and Howell also found that nonuse of the seat belt by the passenger was higher when the subject was male rather than female (all the models were female), indicating possible gender differences in modeling behavior. This was not a primary focus of their study, however, and they recommend further research into gender differences with relation to modeling behavior.

Certain studies have found that seat belt use is related to ethnicity and socioeconomic status (SES) with non-Caucasian populations and those living in the lower SES using seatbelts least frequently (e.g., Nelson, Bolen, & Kresnow, 1998). Other studies have found that seat belt use does not vary by ethnicity after controlling for SES. To test for possible causes of this differential in seat belt use, Shin, Hong, and Waldron (1999) focused on ethnicity, SES, and modeling behavior. Using self-report questionnaires to measure the seat belt use of African American, Asian American, Hispanic American, and Caucasian high school students, they found that parents living in a lower SES demonstrated less frequent modeling of seat belt use than those parents living in a higher SES. Further, parents with a lower SES had a lower belief in the efficacy of seat belts to protect car passengers as compared to those parents with a middle or upper SES. These researchers also found that parental modeling of seat belt use was significantly correlated with their adolescents' seat belt use, while the seat belt use of peers was not associated with the target youths' use.

Overall, the findings regarding seatbelt use indicate that modeling behavior can increase or decrease adolescents' seatbelt use. This result has been found when parents do the modeling and their children imitate that behavior. Finally, some studies indicate there are differences in seatbelt use between individuals of varying ethnic groups, whereas other research indicates these differences disappear when SES is controlled.

Findings Regarding SLT and Religiosity

Previous research has indicated that consistent religious participation is negatively correlated with some health-compromising behaviors (e.g., Beeghley, Bock, & Cochran, 1990). Conversely, it has shown that religiosity is positively correlated with health-promoting behaviors (e.g., Bahr, Hawks, & Wang, 1993). Furthermore, some studies have indicated that some aspects of religiosity are more important than others in relation to health-related behaviors. For example, Lorch and Hughes (1985) determined that importance of religion to the youth was more predictive of alcohol use than religious membership, degree of fundamentalism-liberalism of religious group, church attendance, a combination of church attendance and importance of religion, and a combination of fundamentalism-liberalism and importance of religion. Therefore, because religiosity has been implicated in contributing to the health-related behavior of adolescents, it is being included in this study. Further, because some aspects of religion may influence behavior more than others, the measured aspects of religiosity will be presented separately in some of the data analyses.

Research focusing on religiosity and drug use indicates that the two are inversely related (e.g., Amoateng & Bahr, 1986; Beeghley et al., 1990). In a review of the literature, Bahr et al. (1993) suggested that individuals affiliated with a religion, regardless of denomination, and who attend religious services regularly have lower rates of drug use than those not affiliated with a church or who do not attend church regularly. It also has been suggested that followers of

religions that specifically teach abstinence tend to have lower rates of drug use than those whose religion does not proscribe the use of drugs (Amoateng & Bahr).

Numerous studies have supported the above arguments. Foshee and Hollinger (1996), for example, found that maternal religiosity (defined as religious commitment and involvement) was negatively predictive of alcohol use by adolescent children. They found that maternal religious attendance was more predictive than was maternal religious importance. Other studies have found a negative relationship between parental religiosity and alcohol use among their adolescent children (e.g., Burkett, 1993; Hadaway, Elifson, & Petersen, 1984); however, they only obtained the adolescent's perception of their parents religious commitment and did not ask the parents themselves.

Another study, focusing specifically on adolescent religiosity (Lorch & Hughes, 1985), found that importance of religion to the adolescent was the most predictive indicator of adolescent drug use. The other predictors they studied included church membership, whether the religion was conservative or liberal, church attendance, and combinations of these factors. Every aspect of religiosity measured in this study showed a negative correlation with adolescent substance use except for those that measured how liberal the religion was. Churches that were more liberal and held no official sanctions against alcohol use did not show the negative correlation. Further studies that focused exclusively on the reports of adolescents have shown that religious commitment was associated negatively

and significantly with the onset of drinking alcoholic substances (e.g., Jessor & Jessor, 1975), delinquency (e.g., Cochran, Wood, & Arneklev, 1994), early sexual intercourse (e.g., Casper, 1990), and suicide attempts (e.g., Kandel, Raveis, & Davies, 1991). One study found religiosity to be negatively correlated to alcohol use even after controlling for other variables such as additional deviant behaviors, sensation seeking, tolerance for deviance, rejection of parental authority, poor relationship with parents, peer alcohol use, and parental alcohol use (Webb, Baer, McLaughlin, McKelvey, & Caid, 1991).

These findings are supportive of SLT in that the family is a major source from which adolescents learn religious values and behaviors. It is theorized that parents model religious behavior not only through attending church regularly, but by praying at home and living their everyday lives according to the traditions and/or doctrines of their religion. Modeling of abstinent behaviors by peers and religious leaders (within American Indian nations this includes medicine people) also takes place within the confines of the religious institution or traditional religion-based organizations (e.g., the Boy Scouts, or certain religious societies within a tribe).

Findings Regarding SLT and Additional Health-Related Behaviors

Additional support was found for SLT when it was applied to marijuana and other illicit drug use (e.g., Winfree & Griffiths, 1983). Duncan, Duncan, Hops, and Stoolmiller (1995) found that parental modeling of marijuana use was

significantly related to marijuana use of their children. Additional studies have shown that family system characteristics and parental behaviors are predictive of adolescent substance use (Anderson & Henry, 1994). Glynn (1981) found that family and peer influences affect adolescent drug use and adolescent attitudes regarding drug use, and that peer influences seem to be more short-lived than family influences.

Other studies that have focused on health behaviors of parents and their children found that perpetration of adolescent violence in a dating relationship was related to witnessing a parent hitting or being hit by an adult (Foshee et al., 1999). This study also found that being hit by their mothers was significantly associated with perpetration of violence by daughters but not sons. However, they found that being hit by a father was not associated with further violence by either daughters or sons. Another study also determined that a history of parental violence or abuse was predictive of their adolescents being involved in a peer relationship that included violence (Cantrell, MacIntyre, Sharkey, & Thompson, 1995). These researchers concluded that the father was a more consistent and equally influential model of violent behaviors than were mothers.

Analysis of a national health survey conducted in Norway found that parents' health behaviors provide a model for their adolescent children in the areas of fat intake, exercise, smoking, and alcohol consumption (Rossow & Rise, 1994). Particularly of note in this study was the finding that the effect of parental health behaviors on that of their children did not appear to decrease as the

adolescent aged. Thus, parents may be significant models for their children during adolescence and throughout their adult lives. Further research supports these conclusions and adds that not only are adolescents more likely to use the specific drugs their parents use, but there is a generalization effect (i.e., children use more kinds of substances than their parents do; Andrews, Hops, Ary, Tildesley, & Harris, 1993; Fawzy, Coombs, & Gerber, 1983). These authors noted too that parental abstinence is negatively correlated with substance use in their offspring, therefore providing support for parents as positive role models.

Additional studies have found that children's body mass indexes (BMI) are positively correlated with their mothers' BMI (but not the fathers' BMI), their parents' vigorous exercise, and their family history of cardiovascular disease (Sallis, Patterson, McKenzie, & Nader, 1988). In another area, Dryler (1998) reported that parents' education and occupation affected their children's choice of occupation and level of education. She found that the children chose occupations generally similar (i.e., the same professional level) to that of their parents and obtained a similar level of education regardless of their SES.

Support for SLT has been robust across many settings and with many different behaviors. Overall, studies have shown that modeling a behavior by a parent increases that behavior in their children, whereas modeling abstinence decreases that behavior in their children.

Findings Regarding SLT and American Indian Populations

Very little research has been done on SLT among American Indian adolescents. However, Zitzow (1990) did find that when Ojibway adolescents spent time with their families doing positive activities such as eating, recreational fishing, cleaning house, or having a family discussion, they were much less likely to be involved in court adjudication and delinquency than their peers who engaged in isolated activities or activities involving peers who used drugs and alcohol.

Winfree, Griffiths, and Sellers (1989) conducted a cross-cultural test of SLT to see if it was applicable to American Indian populations. This research focused on alcohol and marijuana use of American Indian and Caucasian adolescents. They found that SLT was a stronger predictor of the level of Indian involvement with marijuana use than alcohol use. They also reported that SLT was more predictive of alcohol use among Caucasians than among American Indians. The authors theorized that alcohol use among American Indian populations is considered normative, so the examples of this type of behavior are ubiquitous in some Indian nations. Therefore, the specific measures they used may not have been sensitive to the cultural modeling presented the American Indian adolescents. It should be noted that this study only used perceived drug use of parents and peers by the adolescent and did not include actual measures of peer use or parental use. Also, both of these studies obtained American Indian samples from only one tribe each.

American Indians have traditionally used modeling as their main style of learning and as a way of passing information on from one generation to the next (H. Mann [Cheyenne], personal communication, May 6, 1998). Several tribes encourage their children to learn by watching their skilled elders, be they parents or other experienced members of the community. The children also see what types of reinforcements are given these individuals by other members of the tribe. This style of learning has often placed American Indian students at odds with the traditional American educational and counseling systems, but it may provide an excellent opportunity for the right intervention and prevention strategies aimed at reducing HCBs.

## Problems and Limitations of Previous Studies

A common problem found with research concerning the correlation of parents' behaviors and their adolescents' behaviors is that the information used for data analysis is reported solely by the adolescent. Many times the parent is never questioned, but rather his/her behavior is reported by the adolescent. Inaccurate reporting by the youth may result in erroneous or inconsistent findings. This problem has been previously identified and some of the more recent studies of SLT include parents' own reports (e.g., Duncan et al., 1995) or an actual measurement of the parents' targeted behaviors (Rossow & Rise, 1994).

It has, however been argued that the youth's perception of what the

parents are doing may be more important than the parents' actual behaviors (e.g., Smith, Miller, Kroll, Simmons, & Gallen, 1999). Also, it should be noted that what the parents are actually doing, and what they are reporting can be very different. Ideally, studies would include all three variables (i.e., objective measures of behavior, parent-reported measures, and the adolescent's perceptions of parents' behaviors).

Another problem found in the current studies is mixed findings concerning the amount of effect parents versus peers have on the behaviors of adolescents. Based on the findings from the previous research, it is clear that parental and peer smoking and drinking behaviors influence these behaviors among adolescents. However, whether parents or peers are more influential on adolescent behavior remains uncertain. Currently, it appears that parental behaviors are more predictive of adolescents' life-long behaviors, while peer behaviors are more predictive of adolescents' behaviors during a specific developmental stage: late adolescence. Additionally, the literature indicates that parental behaviors are more influential than peer behavior during childhood and early adolescence. These findings make sense intuitively, because during childhood and early adolescence youths are dependent upon their parents and other adults, as are their peers. However, in late adolescence, youths usually begin to associate more with peers and less with their parents and other family members. Also, during late adolescence, young people attempt to assert their independence from their parents, and may openly rebel against the behaviors

and ideals that have been modeled and taught by their parents. When this occurs, peer relationships and peer modeling become more important, often wholly important to the older adolescents and parental modeling, then becomes less influential on the adolescent's concurrent behavior.

These hypotheses are supported by the literature. Cross-sectional studies find ambiguous results regarding peer versus parental influence, unless age groups are studied separately (e.g., Meier, 1991; Rossow & Rise, 1994). Generally, studies focusing on younger children find strong parental modeling effects (e.g., Epstein et al., 1995), while studies focusing on older adolescents find stronger peer influences (e.g., Glynn, 1981; Standing & Nicholson, 1989). Longitudinal studies, however, regularly indicate that parental substance use behavior is the best predictor of future (often life-long) substance use by adolescents (e.g., Akers & Lee, 1996; Andrews et al., 1993).

In addition to peer and parental influence, some studies indicate that siblings have a modeling effect on adolescent behavior similar to that of peers (Meier, 1991). Finally, the influence of the parent on a child's behavior may vary by the behavior (or substance used if looking at drug use; Kandel, 1978) or by the gender of the parent versus that of the child (e.g., Duncan et al., 1995; Foshee et al.,1999).

Generalizability to American Indian adolescents may be the largest limitation regarding the research reviewed, because the majority of studies have focused on adolescents from other ethnicities, and several studies were done

with youth from other countries (e.g., Dryler, 1998; Rossow & Rise, 1994). This poses a unique generalizability problem to American Indians because various studies done on adolescents' views of substance use across ethnicities indicate that Native American youth view problem drinking as less serious than Hispanics or Anglo children (e.g., Sigelman et al., 1992). These, and other studies (e.g., Dressler, Bindon, & Gilliland, 1996; Lightdale et al., 1997) indicate that American Indian adolescents subscribe more to a disease theory of substance use; attribute less causal responsibility to the user; do not always view alcohol and tobacco as drugs; and more often than their peers from other ethnic groups, claim that there is nothing they can do to ensure good health (Ma et al., 1998). Additional research has shown that other unique cultural characteristics of American Indian populations may further reduce the generalizability of previous SLT research. For example, it has been suggested that immediate and extended family members play a larger role in influencing attitudes and behaviors than do peers among American Indian adolescents (as compared to adolescents from other ethnicities; e.g., Swaim et al., 1993). This is especially true among rural American Indians who live with or near siblings, cousins, and same-age aunts and uncles but who have limited contact with nonrelated peers (Ma et al., 1998; Shawanda, 1999).

Another situation pertinent to American Indians is the historical intermarrying between American Indians and other ethnicities. Subsequent to the intermarrying, and because of government subsidies provided to American

Indians who are recognized by their tribes, American Indians are the only

ethnicity in America required to define and prove their ancestry by blood quantum

(i.e., whether one is full blood because both parents are from the same tribe, one

is halfblood if one parent is full blood American Indian and the other is not, etc.).

The amount of Indian identity adolescents have influences their ability to

assimilate (accept the mainstream culture and language), remain traditional

(accept only their native customs and language), or become bicultural (accept

both native and mainstream culture and languages; Garrett, 1996). This may

affect their sense of cultural identity which, in turn, may influence the

effectiveness of parental modeling if the adolescent self-identifies as American

Indian, while one parent does not.

Also, the mainstream American understanding of religiosity, when applied

to American Indians, may not be measuring their sense of religion, or spirituality,

accurately. Most American, organized religions have scriptures that are taught in

a sacred place (e.g., a church or synagogue) and detailed rules by which the

followers of that religion are to live and worship. Therefore, such behaviors as

prayer and church attendance are easily understood and measurable. However,

traditional American Indian spirituality is more difficult to measure because it is

interwoven with daily life in unique ways. For example, American Indians may

believe the Creator of life is ubiquitous and that they speak with the Creator

almost constantly, and can do so anywhere. However, these same individuals

may report that they have no religion and do not pray on surveys using traditional

American ways of measuring these constructs (Beck, Walter, & Francisco, 1996). Additionally, American Indian Church members, during a peyote ceremony, invite the Creator to come in and sit among them, but again, may not report attending church or praying (H. Mann [Cheyenne], personal communication, May 6, 1998). In these instances, the traditional American ways of defining religion and prayer do not fit. As one young Cheyenne-Arapaho Sundancer put it, "We do not allow religion to come between us and the Creator" (J. R. Many Suns, personal communication, September 18, 1999).

## Summary

Due to the current poor health status of American Indians, research is warranted that helps develop causal theories regarding health behaviors of this heterogeneous racial/ethnic group. Research conducted on other ethnic groups has shown that modeling of health-compromising and health-promoting behaviors by parents has been positively correlated with those same behaviors in their adolescent children. These findings are consistent with the modeling and imitation aspects of SLT. However, very little research on SLT has been conducted with American Indian youth. The proposed study, therefore, will test the ability of SLT to predict the behavior of American Indian adolescents based on the behavior of their parents. This study is exploratory in nature and will examine the link between American Indian adolescents' behaviors and the behaviors of their parents in key areas found to be pertinent to the health of

adolescents in general: alcohol use, cigarette use, seat belt use, and religious participation.

Drinking alcohol was chosen to be studied because previous research indicates that the prevalence of alcohol use is very high among American Indian adolescents, even more so than their peers from other ethnic minorities (e.g., Bachman et al., 1991). Also, drinking is implicated in other HCBs such as fighting, unprotected or forced sexual intercourse, and accidental death (Beauvais, 1992a; Neumark-Sztainer et al., 1996). Cigarette smoking has been implicated in several of the leading causes of death among American Indians (e.g., cancer, heart disease), and studies also show that American Indian youths smoke more that their non-Indian peers. Thus, smoking behavior was chosen to be researched in the current study.

Seat belt use was studied because injuries and deaths due to motor vehicle accidents are extremely high among American Indian adolescents (Beauvais, 1992a). Additionally, motor vehicle crashes are a leading cause of death among adolescents of all ethnicities, and seat belt use has been shown to greatly reduce injuries and deaths resulting from these crashes (e.g., Howell et al., 1990; Sleet et al., 1986).

Finally, research has indicated that religious participation is a social source for learning health-promoting behaviors among youth (e.g., Amoateng & Bahr, 1986). Because this is a possible area for intervention/prevention strategies in the future, a measure of it will also be included.

## Research Questions

Because of the lack of successful programs aimed at intervention and prevention of the onset of HCB among American Indians, more research needs to be done focusing on the precipitants of these behaviors. Social learning theory has gathered much support for its ability to predict HCB in adolescents of various ethnicities. Further, preliminary research with American Indian adolescents has supported the notion that SLT will apply to American Indians. However, it has also been suggested by previous research that SLT may apply differently to American Indian adolescents than to those of other ethnicities.

Therefore, this research was a preliminary study of the applicability of SLT to American Indian adolescent populations. One key aspect of SLT used to determine this feasibility was the concept that modeling of behaviors by parents influences the imitation of those behaviors by their adolescent children. Furthermore, the review of literature focusing on which HCBs are more applicable to American Indian populations, and what type of findings SLT research has garnered with other ethnic groups thus far helped determine the following research questions.

Research questions:

1.      What is the relationship between American Indian adolescents' smoking behaviors and cigarette smoking by their parents?

2.      What is the relationship between American Indian adolescents'

drinking behaviors and the same types of drinking behaviors of their parents?

3.    What is the relationship between American Indian adolescents' seat belt use and seat belt use by their parents?

4.    What is the relationship between American Indian adolescents' religiosity and the religiosity of their parents?

5.    What is the relationship between American Indian adolescents' religiosity and their smoking, drinking, and seat belt use?

6.    Do the relationships differ when the role model is male versus female, and/or when the youth is male versus female?

7.    Do the relationships differ when the role model is a biological parent versus a nonbiologically related caregiver?

8.    Do the correlations differ when the parent is American Indian as opposed to another ethnicity?

9.    Is there a relationship between the age of the adolescent and the health-related behaviors?

CHAPTER III

METHODS

Overview

Data collected from the National Longitudinal Study of Adolescent Health (Add Health), Wave I, in-home interviews were used for this study. These interviews were collected between April and December, 1995. Wave I is a nationally representative sample of adolescents in Grades 7 to 12 in the U.S. The total sample includes 12,105 adolescents who were interviewed at home. From this sample adolescents who participated in the Add Health study and self-identified as American Indian were included in the current study. Their responses, and those of their parents were operationalized and analyzed according to the interview questions (see Appendices A and B). This study was mainly a correlational design. The variables under study consisted of criterion-based measures of health-related behaviors given by an adolescent respondent and his/her parent (or primary caregiver). Behaviors analyzed included smoking, drinking, seatbelt use, and religious participation.

Purpose and Procedures of the Add Health Study

The Add Health study was initiated based on the understanding that the largest threat to adolescents' health is their behavior. With that in mind, Add Health was designed to focus on what influences adolescents' behaviors,

especially in their social contexts: family, friends, romantic and sexual relationships, peer groups, schools, neighborhoods, and communities. To achieve this design goal, various aspects of the adolescents' lives were explored: diet, exercise, injury, violence, sexual activity, infections, pregnancy, running away, substance use/abuse, suicidal thoughts, health service use, and morbidity. Not only were data gathered from the adolescents themselves, but also from parents, siblings, friends, romantic partners, and fellow students.

The primary sampling frame for the Add Health survey was a database provided by Quality Education Data, Inc. From this database, 80 high schools were selected based on the following criteria: it included an 11th grade and had an enrollment of more than 30 students. The Add Health study design incorporated systematic sampling methods and implicit stratification to ensure that the sample was representative of U.S. schools with respect to region of country, urbanicity, school type, ethnicity, and school size. If a high school refused to participate, another school was selected as its replacement from within the same stratum. Once a high school was recruited, its feeder schools (those schools which included seventh grade and sent their graduates to the selected high school) were identified and selected based on the proportional number of students it sent to the high school. In all, there are 134 discrete schools in the core study consisting of approximately 80 pairs of high schools and feeder schools (some high schools are their own feeder schools because they also include the seventh grade).

The Wave I interviews were the same for all respondents and took from 1 to 2 hours depending on the respondent's age and experiences. Most of the interviews were done at the respondent's place of residence in a one-on-one interview with a trained researcher.

To provide for the respondent's confidentiality and to minimize interviewer or parental influence, no paper questionnaires were used. Instead, all responses were recorded on lap-top computers. For less sensitive sections, the interviewer read the questions aloud and recorded the respondent's answers. For more sensitive sections, the respondent listened to pre-recorded questions through earphones and entered the answers directly. Not every respondent was asked every question. Some questions were not asked due to the respondent's age, sex, and experiences (e.g., if youths responded they have never had a drink, they were not asked questions regarding how much or how often they drank).

<div align="center">Participants</div>

The data presently being considered come from the Add Health in-home sample, Wave I, main (core) sample. All the rosters from the 134 chosen schools were analyzed and students in each school were stratified by grade and sex. Approximately 17 students were randomly chosen from each strata so that a total of about 200 adolescents was selected from each of the 80 pairs of schools.

This resulted in a core sample of 12,105 adolescents. From this sample,

those adolescents who indicated that they are American Indian/Native American only, or that American Indian/Native American best describes their ethnicity were selected for analysis. It is important to note that the American Indian status of the adolescent was determined by self-identification only; they did not have to provide blood quantum or tribal affiliation information. Then, from these selected adolescents, only those that also had a parent questionnaire filled out were selected for the current study. This produced a sample size of 290 American Indian adolescents. Divided by sex, there were 136 (46.9%) male youth and 154 (53.1%) female youth. Eighty-two (28.3%) reported being from a rural area, 100 (34.5%) reported being from suburban areas, and 102 (35.2%) indicated living in urban areas.

## Instruments

Specific questions were taken from the in-home survey of both the parents and the adolescents and operationally defined. The questions had to measure the behaviors and constructs being addressed in this study: drinking, smoking, seat belt use, and religiosity. Further, questions pertaining to demographic information were also included in order to verify that the adolescent subjects are American Indian, and to study age, ethnic, and sex differences among the respondents.

In order to be operationalized and included in the analysis, the questions had to focus on specific behaviors, except for religiosity where some of the

subjects' values (i.e., importance of religion to the respondent) were examined.

Also, the questions asked of the parents had to be very similar to those asked of

the adolescents in order to insure they were measuring the same construct.

Most of the questions chosen allowed the respondents to rate their behavior on a

4- to 6 point scale.  An example of a HCB question is, "How often do you wear a

seatbelt when you are riding in or driving a car?"  The answer choices are,

"never, rarely, sometimes, most of the time, and always."  This question is

exactly the same when asked of the parent and the adolescent.  Questions such

as this one were given values in order to measure the behavior or construct of

interest and develop a composite score for each HCB for both adolescents and

parents.  For example, the answer of "never" was given a score of 0, "rarely"

equaled 1, and "always" equaled 4, where 0 is the absence of the behavior and

higher scores indicate a strong presence of the behavior.  Appendixes A and B

contain a complete list of the questions and possible answers, with values given,

chosen for this study.

## Data Analysis

For research questions 1 through 3, Pearson product-moment correlations

were calculated using the appropriate respondent questions for the parents and

the corresponding questions for the adolescents.  For example, to determine if

the parents' smoking status relates to whether the youth has ever tried a

cigarette, question B2 of the parent questionnaire (Appendix B) was correlated

with question B1 of the adolescent questionnaire (Appendix A). Further, to determine if the parents' binge-drinking behaviors relate to the binge-drinking behaviors of the youth, question C2 of Appendix B was correlated with question C3 of Appendix A. A final example would be correlating the reported seatbelt use of the parent (question D1 of Appendix B) with the reported seatbelt use of the adolescent (question D1 of Appendix A). The correlations between the parents' behaviors and their children's behaviors were analyzed to answer the research questions.

For research question 4, the adolescents' answers on the questionnaire pertaining to their religious behaviors and beliefs (questions E2, E3, and E4 of Appendix A) were added together to form an adolescent religiosity scale. An obtained score of 0 indicated no religiosity (the adolescent reported that they never prayed or attended religious services and that religion was not at all important to them), while a score of 10 indicated that they were very religious (the adolescent reported that they attended religious services at least once a week, prayed at least once a day, and that religion was very important to them). The sum of the parents' answers were calculated in the same way to form a parent religiosity scale (questions E2, E3, and E4 of Appendix B). These religiosity scales were then correlated to find if a relationship exists.

Seven Pearson correlations were calculated to answer research question 5. The adolescent's religiosity scale was related separately to each aspect of drinking behavior (i.e., ever tried, frequency of drinking, and binge drinking),

smoking behavior (i.e., if they have ever tried a cigarette, if they have ever smoked regularly, and how often they smoke currently), and seat belt use as reported by the youth.

To answer research questions 6, 7, and 8, the above-mentioned correlations were calculated; however, the data were split before the correlations were run in order to properly conduct the analysis. For example, to determine if ethnicity of the parent affected the relationship, the non-Native American parents were excluded and only those parents identifying as all or mostly Native American were included in the first Pearson correlation. The same correlation was then calculated using only those parents who self-identified as some ethnicity other than Native American. In addition to determining the effects of ethnicity on the associations, this procedure was also used to determine the effects of sex, and relatedness to the youth on the correlations. For example, to determine if the effects were different for female youth versus male youth, the correlation was calculated with all male youth only, then repeated for all female youth only. To determine if relatedness to the youth was a factor, all biological parents (mothers and fathers) were included in the first correlation, then excluded for the same correlation run a second time.

For question 9, multiple correlations were performed to determine the relationship between the adolescents' ages and their behaviors. For example, the youths' age was correlated with responses to questions asking if they had ever tried a cigarette, smoked regularly now, and have ever smoked regularly. In

other words, correlations were carried out between each smoking behavior question asked the youths and their reported ages to determine if age is predictive of these HCBs.

CHAPTER IV

RESULTS

Correlations with Smoking Behavior

The following section answers research question 1 and provides information regarding questions 6 through 9 (see Table 1). Overall, this study found significant positive correlations between the parents' smoking status and the youth's smoking behaviors. There were no significant statistical differences found when the parents were American Indian versus non-American Indian or when the role model was male versus female. Also, no correlations differed significantly when the role model was biologically related versus nonbiologically related. Finally, the age of the adolescent was found to be positively correlated with their smoking behavior.

However, the specific question of whether the parents' current smoking status predicts whether or not their youths have ever tried a cigarette produced very few statistically significant correlations. No significant correlations were found when all respondents were included, when the parents were separated for biological relatedness to the youth, or when the youth were separated based on sex. When the female youth were related with the fathers, there was a significant positive correlation found ($r = .548$, $p = .05$); and when only the American Indian adults were included in the calculation, there was also a significant positive correlation found ($r = .180$, $p = .05$). The results of all the correlations for

Table 1

*Correlations Between the Parents' and Youths' Smoking Behaviors*

| Subjects selected for inclusion in the correlation | Parent current smoking status correlated with... | | | | | |
| | If the youth has ever tried a cigarette | | If the youth has ever smoked regularly | | How often the youth currently smokes | |
| | *n* | *r* | *n* | *r* | *n* | *r* |
| All responders | 289 | .085 | 290 | .211*** | 289 | .208*** |
| Biological parents | 237 | .072 | 238 | .249*** | 238 | .159* |
| Nonbiological adults | 45 | .04 | 45 | -.061 | 45 | .028 |
| American Indian adults | 117 | .180* | 117 | .245** | 117 | .236* |
| Non-American Indian adults | 167 | .054 | 168 | .192* | 167 | .193* |
| Male youth with all adults | 135 | .092 | 136 | .217* | 135 | .176* |
| Female youth with all adults | 154 | .092 | 154 | .225** | 154 | .276** |
| Male youth and male adults | 16 | -.098 | 16 | .098 | 16 | .098 |
| Female youth and female adults | 141 | .052 | 141 | .197* | 141 | .263** |
| Male youth and female adults | 120 | .175 | 120 | .242** | 120 | .114 |
| Female youth and male adults | 13 | .548* | 13 | .386 | 13 | .420 |

* Correlations are significant at $p < .05$, ** Correlations are significant at $p < .01$, *** Correlations are significant at $p < .001$.

smoking behavior can be found in Table 1.

Correlations were also done to determine if a relationship existed between the parents' current smoking status and if the youths had ever smoked regularly, that is, if they had smoked one cigarette everyday for 30 days at any time in their lives. These findings differ from those presented above in dramatic fashion. The majority of results showed significant positive correlations (see Table 1). The only relationships not found to be significant were when nonbiological parents only were included, when sons were compared to fathers, and when daughters were compared to fathers.

Additionally, whether the parents currently smoked or not was correlated with how often the youth has smoked in the last 30 days. Again, almost all of the relationships showed a statistically significant correlation (see Table 1). The only correlations not found to be significant were when sons and fathers were compared, when sons and mothers were compared, and when daughters and fathers were compared.

In order to statistically determine if certain observed correlations differed, tests of significance (Appendix C) were applied to the correlations ($r_1$ vs. $r_2$). This test of significance was only done when the samples being correlated were independent from each other (e.g., when biological parents were analyzed vs. nonbiological parents). Furthermore, the only time the data set was divided in this way was when research questions 6 through 8 were being analyzed. For example, when the parents' smoking status was compared to whether or not the youth had ever tried a cigarette, there were differences found in the statistical significance when the parents were separated into the categories of American Indian or non-American Indian (American Indian being statistically significant and non-American Indian being not). However, when the test of significance was applied to the obtained correlations ($r_1$, American Indian parents only included and $r_2$, non-American Indian parents only included) there was no statistical difference found between these two populations. Therefore, it cannot be concluded that the correlations for this smoking behavior differ when the parent is American Indian as opposed to another ethnicity, even though the correlation for

one is statistically significant, while the correlation for the other is not.

In fact, only one pair of correlations related to smoking behavior showed a statistical difference. In this case, the relationship between parents' smoking status and if the youth regularly smoked was calculated with biological parents and nonbiological parents being figured separately. The results indicated that biological parents' smoking status had a significant, positive correlation on whether the youth had ever smoked regularly, whereas the nonbiological parents had no statistical correlation. The difference between these two correlations was significant at the $p = .05$ level.

Finally, three correlations were examined to determine the effect of the youths' ages on their smoking behaviors. Age was found to be correlated with behaviors for each question related to smoking asked the youth. The correlations indicated that the youths were more likely to have tried a cigarette, more likely to have smoked regularly, and more likely to smoke more frequently the older they were. When their ages were correlated whether they had ever tried a cigarette, a significant positive correlation was found at the $p = .05$ level, $r(287) = .136$, $p = .021$. When their age was correlated with whether the youth smoked regularly and how often the youth smokes now, significant positive correlations were found at the $p = .01$ level, $r(288) = .164$, $p = .005$, and $p < .001$ level, $r(284) = .229$, $p < .001$, respectively.

Correlations with Drinking Behavior

Overall, there were very few statistically significant correlations between the parents' drinking behaviors and the youths' drinking behaviors. There were differences found between biological and nonbiological role models with regard to if the parent drinks and the youths' binge-drinking behaviors, but not with any of the other correlations. There were also no differences found between the American Indian adults and non-American Indian adults. The correlations did differ significantly when the role model was male versus female. Also, the age of the adolescent was positively correlated with each of the youth's drinking behaviors. These specific findings will be detailed further below.

First, whether or not the parents reported that they currently drank alcohol was correlated with whether the youths reported they had ever tried a drink, how many drinks the youths had in the last year, and how often the youths had drunk excessively (binged) in the last year (Table 2). Second, how often the parents reported they drank in the last month was correlated with whether the youths reported they had ever tried a drink, how many drinks the youths had in the last year, and how often the youths had binged in the last year (Table 3). Finally, the parents' reported binge drinking in the last month was correlated with the same three youth behaviors (Table 4).

There were almost no significant correlations between whether parents drank alcohol and the drinking behavior of the youths. The only correlations found were when only female youth were related to all the adults. As can be

seen in Table 2, there was a positive relationship found between the parents' reported drinking and the female adolescent ever having tried a drink, and how often she drank in the last year. The correlations obtained from just the female youths being included ($r_1$) were compared to those found when just the male youths were included ($r_2$). When the test of significance (for explanation see Appendix C) was applied to these correlations, it was not statistically significant, indicating that it cannot be assumed that these two populations are different.

Table 2

*Correlations Between the Parents' Reported Drinking and the Youths' Drinking*

| | Does the parent drink alcohol correlated with... | | | | | |
| | If the youth has ever tried a drink more than once or twice | | How often the youth has drunk in the last year | | How often the youth has binged in the last year | |
| Subjects selected for inclusion in the correlation | n | r | n | r | n | r |
|---|---|---|---|---|---|---|
| All responders | 287 | .109 | 286 | .113 | 290 | .037 |
| Biological parents | 236 | .085 | 235 | .100 | 238 | .053 |
| Nonbiological adults | 44 | .262 | 44 | .155 | 45 | -.126 |
| American Indian adults | 116 | .176 | 115 | .123 | 117 | .058 |
| Non-American Indian adults | 166 | .046 | 167 | .101 | 168 | .021 |
| Male youth with all adults | 135 | .025 | 133 | .064 | 136 | .077 |
| Female youth with all adults | 152 | .188* | 153 | .171* | 154 | .002 |
| Male youth and male adults | 14 | .411 | 14 | .453 | 14 | .359 |
| Female youth and female adults | 134 | .157 | 135 | .152 | 136 | -.016 |
| Male youth and female adults | 119 | .005 | 117 | .031 | 120 | .042 |
| Female youth and male adults | 13 | .178 | 13 | .192 | 13 | .279 |

* Correlations are significant at $p < .05$

Additionally, although statistical significance was not reached for either biological or nonbiological parents when figured separately, there was a statistically significant difference in the correlations found for these two groups when looking at the relationship between the parents' drinking status and the youth's binge drinking. The correlation for biological parents was significantly different than the correlation for nonbiological parents (Z = 3.73, $p$ <.001).

Table 3

*Correlations Between the Parents' Reported Frequency of Drinking and the Youths' Drinking*

| | How often the parent drank in the last month correlated with... | | | | | |
|---|---|---|---|---|---|---|
| | If the youth has ever tried a drink more than once or twice | | How often the youth has drunk in the last year | | How often the youth has binged in the last year | |
| Subjects selected for inclusion in the correlation | n | r | n | r | n | r |
| All responders | 287 | .056 | 286 | .106 | 290 | .034 |
| Biological parents | 236 | .034 | 235 | .086 | 238 | .029 |
| Nonbiological adults | 44 | .156 | 44 | .130 | 45 | -.013 |
| American Indian adults | 116 | .077 | 115 | .119 | 117 | .043 |
| Non-American Indian adults | 166 | .030 | 167 | .095 | 168 | .016 |
| Male youth with all adults | 135 | -.055 | 133 | .034 | 136 | .039 |
| Female youth with all adults | 152 | .150 | 153 | .183 | 154 | .034 |
| Male youth and male adults | 14 | .050 | 14 | -.007 | 14 | -.092 |
| Female youth and female adults | 134 | .135 | 135 | .151 | 136 | -.011 |
| Male youth and female adults | 119 | -.047 | 117 | .040 | 120 | .047 |
| Female youth and male adults | 13 | .130 | 13 | .577* | 13 | .711** |

* Correlations are significant at $p$ <.05, ** Correlations are significant at $p$ <.01.

Table 4

*Correlations Between the Parents' Reported Binge-Drinking and the Youths' Drinking*

| Subjects selected for inclusion in the correlation | How often the parent binge drinks alcohol correlated with… | | | | | |
| | If the youth has ever tried a drink more than once or twice | | How often the youth has drunk in the last year | | How often the youth has binged in the last year | |
| | *n* | *r* | *n* | *r* | *n* | *r* |
| All responders | 284 | .007 | 283 | -.026 | 287 | -.011 |
| Biological parents | 233 | .005 | 232 | -.032 | 235 | .018 |
| Nonbiological adults | 44 | .175 | 44 | .063 | 45 | -.030 |
| American Indian adults | 114 | .083 | 113 | .021 | 115 | .053 |
| Non-American Indian adults | 165 | -.051 | 166 | -.073 | 167 | -.054 |
| Male youth with all adults | 134 | -.079 | 132 | -.064 | 135 | .012 |
| Female youth with all adults | 150 | .076 | 151 | .013 | 152 | -.025 |
| Male youth and male adults | 14 | -.084 | 16 | -.150 | 14 | -.005 |
| Female youth and female adults | 133 | .047 | 134 | -.045 | 135 | -.061 |
| Male youth and female adults | 118 | -.064 | 116 | -.059 | 119 | .009 |
| Female youth and male adults | 13 | .386 | 13 | .597* | 13 | .710** |

* Correlations are significant at $p < .05$, ** Correlations are significant at $p < .01$.

The question of whether the frequency of the parents' drinking would relate to the drinking behaviors of their youths yielded only two significant positive correlations as well (see Table 3). These correlations were found when the female youths' frequency of drinking and binge-drinking behaviors were each correlated with male adults' (mostly consisting of the biological father) frequency

of drinking. Tests of significance were applied to the obtained correlations when daughters were correlated with fathers and compared to those correlations found when sons were correlated with fathers for the same behaviors. There was no difference found when the question of parents' frequency of drinking was correlated with frequency of the youth's drinking, indicating that the samples may not be different. However, there was a statistical difference between the samples of female youth ($r_1$ = .711) and male youth ($r_2$ = -.092) when the father's frequency of drinking and the youth's binge-drinking behaviors were correlated. This finding was significant ($Z$ = 2.24, $p$ <.05), indicating these two samples are different with regard to this behavior.

As Table 4 shows, almost identical results were found when the parents' binge drinking was correlated with the youth's drinking behaviors as those found when the parents' frequency of drinking was used for the correlations. Once more, the only statistically significant correlations found were when the female youths were correlated with the male adults. Again, the relationships found when daughters and fathers were correlated ($r_1$) was compared to the relationships found when sons and fathers were correlated ($r_2$). These tests of significance indicate that the male youth and female youth samples are different with regard to these correlations when the youths' drinking frequency measure is used ($Z$ = 1.96, $p$ = .05), and when the youths' binge-drinking measure is used ($Z$ = 2.04, $p$ = .05). Therefore, it was found that daughters have a stronger

significant positive correlations when correlated to fathers than do sons when correlated to fathers.

For all three of the youth drinking behavior measures (i.e., if they drink, how often they drink, and if they drink to excess), age was found to correlate positively. When age was correlated with if the youth had ever tried alcoholic drinks, the finding was significant at the $p = .05$ level, $r(285) = .141$, $p = .017$. When the frequency of the youth's drinking was correlated with age, the relationship was significant at the $p < .001$ level, $r(284) = .229$, $p < .001$. Finally, when binge-drinking behavior was correlated with age, the relationship was significant at the $p < .01$ level, $r(288) = .164$, $p = .005$.

## Correlations with Seatbelt Use

The question of whether the parents' seatbelt use was related to the use of seatbelts by the adolescents was very straightforward. Both the adults and the youth were asked the same question of how often they use their seatbelt. Table 5 shows the results of this correlation.

Most of these relationships show a statistically significant positive relationship. However, when the sample correlations are compared, the only relationship showing a significant difference is when the male youth and female youth were correlated separately with all the adults included. The difference between these populations is statistically significant ($Z = 3.64$, $p < .001$),

Table 5

*Correlations Between the Parents' and Youths' Seatbelt Use*

| Subjects selected for inclusion in the correlation | n | r | p |
|---|---|---|---|
| All responders | 290 | .309*** | <.001 |
| Biological parents | 238 | .298*** | <.001 |
| Non-biological adults | 45 | .434** | .003 |
| American Indian adults | 117 | .245** | .008 |
| Non-American Indian adults | 168 | .347*** | <.001 |
| Male youth with all adults | 136 | .484*** | <.001 |
| Female youth with all adults | 154 | .091 | .264 |
| Male youth and male adults | 16 | .354 | .179 |
| Female youth and female adults | 144 | .109 | .200 |
| Male youth and female adults | 122 | .506*** | <.001 |
| Female youth and male adults | 18 | .126 | .619 |

* Correlations are significant at $p < .05$, ** Correlations are significant at $p < .01$, *** Correlations are significant at $p < .001$.

indicating the correlations represent a difference between the male and female youth.

With regard to the research questions, there were no differences found between the biologically related role models versus those who are not biologically related or between the American Indian or non-American Indian role models. Furthermore, there were no significant correlations between seatbelt use and the age of the adolescent, $r(288) = -.088$, $p = .134$.

Defining and Correlating the Religiosity Scale

To clarify this section, a brief discussion of religiosity is necessary. The concept of religiosity for this study was based on four questions asked of both the

adults and the youths, but only three were used in the analyses. First, respondents were asked if they identified with any religion. If this was answered "yes," then the individuals were asked the remaining three questions pertaining to religion. These questions can be found in the appendices and consist of how often the person prayed, how often the person attended church, and how important religion was to that individual. Because religiosity is a multifaceted concept that is difficult to define and measure, these three questions were combined into a single religiosity scale. The religiosity scale is the same for both the parents and the adolescents and consists of the sum of their answers regarding the three religiosity questions. The possible range of this scale is from 0 to 10. A score of 0 would indicate that the respondent reported never praying, never attending church, and that religion was not important to that person at all. Conversely, people scoring a 10 would have reported that they attended religious services once a week or more, prayed at least once a day, and that religion was very important to them.

The religiosity scale of the adolescent was correlated with the religiosity scale of the adult to determine if a relationship existed, and if the relationship varied depending on the sex of the parent or child, or the ethnicity of the parent, and so forth. Results (see Table 6) show positive correlations with one exception, when male adolescents were compared with male adults. When the test of significance was applied to the correlation between female youth and male adults ($r_1$) and the correlation between male youth and male adults ($r_2$), it was

Table 6

*Correlations Between the Parents' and Youths' Religiosity Scales*

| Subjects selected for inclusion in the correlation | n | p | r |
|---|---|---|---|
| All responders | 211 | <.001 | .353*** |
| Biological parents | 174 | <.001 | .362*** |
| Nonbiological adults | 19 | .036 | .484* |
| American Indian adults | 114 | <.001 | .344*** |
| Non-American Indian adults | 150 | <.001 | .404*** |
| Male youth with all adults | 90 | .006 | .287** |
| Female youth with all adults | 121 | <.001 | .418*** |
| Male youth and male adults | 16 | .608 | .139 |
| Female youth and female adults | 141 | <.001 | .372*** |
| Male youth and female adults | 122 | .002 | .279** |
| Female youth and male adults | 18 | <.001 | .740*** |

* Correlations are significant at $p$ <.05, ** Correlations are significant at $p$ <.01,
*** Correlations are significant at $p$ <.001.

significant $(Z = 2.14, p = .01)$, indicating a difference in the correlations found

between male and female youth when compared to male adults. None of the

remaining correlations show a significant difference to its comparative correlation

(e.g., American Indian adults compared to non-American Indian adults or

biological parents compared to nonbiological parents).

In summary, there was a difference found in the relationship when the role

model was male versus female. However, there were no differences found

between biologically and nonbiologically related role models, and American

Indian and non-American Indian role models, and there was not a statistically

significant correlation between the youths' ages and their religiosity scales,

$r(222) = .011$, $p = .872$.

### Correlations Between Religiosity and Health Behaviors

The following section describes the results found when the youth's

religiosity score was correlated with the youth's health related behaviors

(research question 5). Research questions 7 through 9 (i.e., does the

relationship differ depending on biological relatedness, does it differ depending

on ethnicity of the parent, and is there a relationship between the age of the

adolescent and the behaviors) are not specifically addressed in this section.

Additionally, part of question 6 is answered in that there were differences found

between the male and female youths, but the sex of the parent is not addressed.

These findings will be reported in detail in this section. Also, there will be some

brief information presented on the different questions that make up the religiosity

scale, to see if some aspects of religiosity have more significant correlations than

others.

To determine if the youth's religiosity was correlated with that youth

engaging in health-related behaviors, the youth's religiosity scale was correlated

with the following: if the youth has ever tried a cigarette, if the youth has ever

smoked regularly, how often the youth smokes now, if the youth has ever tried a

drink, how often the youth drank alcohol in the last year, how often the youth has

binged on alcohol in the last year, and how often the youth wears a seatbelt.

Table 7 shows the results of these correlations. Overall, the female adolescents show more statistically significant negative correlations between HCBs and religiosity than the male youth. It may be important to note here what the negative relationship indicates; that is, the higher the religiosity scales, and therefore, the greater the role of religion for the adolescent, the fewer the health-compromising behaviors reported. When the two sexes were compared, their correlations were significantly different from one another with regard to if the youth had ever tried a cigarette ($Z = 3.096$, $p = .01$), and how often they smoked currently ($Z = 2.23$, $p = .05$), indicating a significant difference between male and female youth in these areas. The only correlation found to be greater for males than females was seatbelt use. However, this difference in the sample correlations was not significant.

Because the concept of religiosity is difficult to define with any population, and with American Indians especially, the different factors of the religiosity scale (i.e., religious service attendance, prayer, and importance of religion) were separated and correlated with the youths' health-related behaviors to determine if some aspects of religiosity were more predictive of the health-behaviors of the American Indian adolescents than others. Broken down in this fashion, there were only three correlations that reached statistical significance. How often the youths pray was negatively correlated with ever having tried a cigarette for the female youth only, $r(152) = -.187$, $p = .020$. How often the youths attend

Table 7

*The Youths' Religiosity Scales Correlated with Their Health-Related Behaviors*

| The youth's religiosity scale correlated with if, or how often, the youth... | With all youth | | Only males | | Only females | |
|---|---|---|---|---|---|---|
| | $n$ | $r$ | $n$ | $r$ | $n$ | $r$ |
| Has ever tried a cigarette | 224 | -.116 | 100 | .122 | 124 | -.290*** |
| Has ever smoked regularly | 224 | -.094 | 100 | .015 | 124 | -.169 |
| Smokes now | 224 | -.113 | 100 | .048 | 124 | -.250** |
| Has ever had a drink of alcohol | 222 | -.163* | 100 | -.056 | 122 | -.201* |
| Has drank alcohol in the past year | 221 | -.136* | 98 | -.043 | 123 | -.186* |
| Has binged in the past year | 224 | -.093 | 100 | -.060 | 124 | -.085 |
| Wears a seatbelt | 224 | -.212*** | 100 | -.233* | 124 | -.134 |

\* Correlations are significant at $p < .05$, ** Correlations are significant at $p < .01$,
\*** Correlations are significant at $p < .001$.

services was also negatively correlated females ever having tried a cigarette, $r(152) = -.162$, $p = .044$. These correlations were statistically different from the correlations found for male youth: correlation for male youth was $r(134) = .077$, $p = .375$: test of significance between correlations was $Z = 2.02$, $p = .05$. Seatbelt use and how often the adolescents prayed showed a significant negative relationship, $r(288) = -.114$, $p = .05$. For this last result, there were no differences found between the male and female youth population correlations.

CHAPTER V

DISCUSSION

The purpose of this study was to determine if SLT is applicable to American Indian adolescent populations, especially when parents are the role models and the modeling in question involves health-related behaviors. Further, this study explored areas where intervention or prevention strategies could be implemented to lower the incidence of HCB and encourage healthier behaviors. The purpose of this section is to discuss the relevant findings, to delineate the study limitations, and to provide ideas and directions for future research.

Generally, the findings in this study are similar to those found with other studies, which suggests that SLT is similarly applicable to American Indians as it is with other ethnic groups. However, there is evidence to suggest that parental role models have more influence with the female American Indian adolescents versus the male American Indian adolescents. Further, contrary to previous findings (e.g., Meier, 1991), male role models may be more influential than female role models in certain areas, especially for female adolescents. The following sections will discuss these findings in more detail, and will discuss the implications the results have for SLT in the areas of smoking, drinking, seatbelt use, and religiosity.

Support for Social Learning Theory

Partial support was found for SLT as it applies to the modeling of health-

related behaviors. Based on the data, it appears that parents are viable role models of health-related behaviors for American Indian adolescents in the areas of smoking, seatbelt use, and religiosity. In general, the findings support that the reported behaviors of the parents in these areas are positively correlated with the same behaviors by the adolescents.

However, the findings are mixed concerning SLT when it comes to alcohol consumption. Overall, there was little support for the theory that alcohol consumption by the parents related to the drinking behaviors of their American Indian youth with one exception, female youth. Generally, if the parents drank, the female youths were more likely to have tried alcohol. If the parental role model was male, the correlations were more significant, especially in the areas of drinking frequently and excessively (binge-drinking).

Findings of the Current Study Regarding SLT and Smoking Behavior

Previous research regarding smoking behavior has indicated that parents', especially the mother's, smoking is predictive of smoking behaviors in their adolescent children (e.g., Meier, 1991). The current study is supportive of this finding in that significant positive correlations were found between youth and their parents. Further, although previous studies have indicated that both male and female adolescents are equally influenced by their mothers' smoking (e.g., Øygard et al., 1995), and that fathers have very little influence on adolescent smoking behavior (e.g., Epstein et al., 1999), the current study can provide only

partial support for these findings. The current data indicate that both male and female youth are influenced by whether or not their mothers smoke. This finding is especially true for the question of whether or not the youth has ever smoked regularly. However, there was no correlation found between youth's and mother's smoking for the question of whether or not the youth had ever tried a cigarette, indicating that the mother's influence may be more pertinent to regular cigarette use than if the youth ever starts smoking. This is consistent with previous research that suggests that parents (especially mothers) smoking status may influence the youths more in the long term (i.e., smoking status across the lifespan) versus the short term (e.g., Morgan & Grube, 1994). Additionally, this study suggests that female youth may also be more influenced by their mother's smoking than male youth with regard to how often the adolescent currently smokes.

Conversely, the results indicate that male adults may influence female adolescents with regard to starting smoking more than female role models do. The influence of the male parent in this study is somewhat unique compared to previous findings (e.g., Meier, 1991). The influence of male role models may indicate an area where American Indian female adolescents differ from female adolescents of other ethnic backgrounds, because this type of correlation has not been seen in the previous studies. Instead, other research has generally indicated that mothers' behaviors are more influential than fathers' behaviors (e.g., Øygard et al., 1995). Also, the female American Indian adolescents appear

to differ in this area from American Indian male adolescents, possibly indicating a different type of relationship with the father between the two adolescent genders. Encouraging fathers and daughters to spend time together doing healthy activities (e.g., fishing, talking, doing housework) may be an excellent area for intervention/prevention efforts with female youth.

Further, the correlations were much higher when the parents were biologically related, and there were no significant correlations when nonbiologically related parents were included (this does include biologically related extended family members). This indicates that biologically related parents may have more influence on whether or not their children smoke regularly than extended family, or other caregivers. This finding is also contrary to the theory that American Indian adolescents may be equally influenced by both extended family members and biological parents. However, these findings are viewed as tentative because there were very few biologically related extended family members in this sample.

Overall, these findings indicate that smoking behavior among all the adult models, especially those that are biologically related, predicts smoking behaviors in the adolescents. Although not statistically significant, the ethnicity of the model did seem to affect the strength of the correlation, with American Indian adults being more influential. This finding is supportive of the theories related to SLT that state the more similar the model is to the youth, the more likely it is the behavior will be copied (e.g., Kalbfleisch & Davies, 1991). This may have

significant applications for future prevention/intervention efforts, in that American Indian adults, specifically, will need to be involved in the lives of American Indian youths as family members and mentors.

Also, the correlations with adults' behaviors were higher for female youth than those found for the male youth. Although these two populations were not found to be statistically different, this finding could indicate that female youths are more influenced by their parents' smoking status than male youth. Again, this may be an important finding for female youth, indicating that adult role models will be a viable option in preventing young, American Indian women from smoking by modeling nonsmoking behaviors, and by educating these female youths about the hazards of smoking cigarettes. Conversely, these findings also indicate factors other than adult influences may be affecting male, American Indian adolescents with regard to smoking behaviors. Finally, the results showed that all the smoking behaviors were positively correlated with the youths' ages, indicating that prevention efforts should target younger adolescents, whereas intervention efforts would have to be geared more towards older adolescents.

### Findings of the Current Study Regarding SLT and Alcohol Use

Previous research studies have documented the parental influence on adolescents' drinking. For example, Barnes and Welte (1990) reported that if either parent was a heavy drinker, adolescents were much more likely to be heavy drinkers themselves. Other studies indicate that drinking behaviors are

influenced by parental behaviors (e.g., Barnes et al., 1986).

Surprisingly, the current study found mixed support for parents as role models in the area of alcohol consumption. In fact, a major finding of this study was the lack of significant correlations found between parents and male youths with regard to drinking behaviors. A second major finding of this research was that the parents' drinking behaviors did influence the drinking behaviors of the female adolescents, indicating a significant difference between male and female youth in this area.

In general, the results appear to indicate that if either parent drinks, then female youth are more likely to have tried a drink, and are more likely to drink regularly. Similar to the results found with smoking behaviors, the drinking behaviors of male adult role models, especially, appear to influence the more severe drinking behaviors of the female adolescents. For example, how much male role models drank in the last month was significantly correlated with how much the female youths drank in the last year, and how often the female adolescents binged. Similarly, how often male role models binged in the last month was positively correlated with how often female youth drank in the last year. Again, these findings are contrary to previous studies which suggest that female role models are more influential than male role models with regard to health-compromising behaviors of adolescents (e.g., Foshee & Hollinger, 1996; Sallis et al., 1988).

Conversely, there was not one significant correlation found regarding the

influence of parents on male youth. It is possible other factors (such as peers) influence male youth to start drinking, keep drinking, and to binge drink. A study by Ary et al. (1993) suggests that parental alcohol use does not affect the concurrent use of alcohol by their children, but it does affect their later, long-term use. This could be a partial explanation of the results found in the present study. Also, it has been suggested that there are few prohibitive attitudes towards alcohol use among American Indians (Winfree et al., 1989). This theory notes that American Indians did not have alcohol until it was introduced by Europeans, which means that American Indian tribes historically did not have prohibitive stories or taboos against its use (the use of oral stories is a traditional way American Indians pass on the laws of the tribe). They certainly did not have any information regarding the negative effects of chronic use. Also, it may be that alcohol use has recently become an accepted coping strategy for many American Indians to deal with poverty, unemployment, being separated from their children, losing their traditional ways, and so forth. This type of coping may make alcoholism ubiquitous among some tribes. If this theory of no prohibitive attitudes towards alcohol use is true, it may be that American Indian culture in general may be encouraging or allowing adolescents to drink, and the drinking behaviors of their parents are no longer influential.

Also, there was a finding of interest regarding the biological relatedness of the models to the youth with regard to the parents' drinking status and the youths' binge drinking. There was a significant difference between the biologically

related and nonbiologically related populations, indicating that biologically related parents may have more effect on the binge-drinking behaviors of their adolescent youths. This may, in part, be explained by a finding in a study done by Epstein et al. (1995), that most adolescents get their first drink of alcohol from their parents. It could also be that whether or not the parents drink in front of their children, just having alcohol in the house may give adolescents the message it is all right to drink, and it certainly gives adolescents greater access to alcohol. Finally, it could be due to genetic factors. Previous research has shown that alcoholism may be genetically inheritable (Steen, 1996). One would then expect to see alcohol abuse run higher in some families than others, and also expect that those who are biologically related to alcohol abusers would be more likely to abuse alcohol as well.

As with smoking behavior, age of the youth was found to positively correlate with each of the three drinking behaviors measured, indicating that prevention efforts would focus on young adolescents and intervention would target older adolescents.

### Findings of the Current Study Regarding SLT and Seatbelt Use

Numerous studies have indicated that seatbelt use by parents predicts the subsequent seatbelt use of their children (e.g., Shin et al., 1999), and the current study provides additional support for this finding. Parents' use or nonuse of seatbelts was strongly, positively correlated with the same type of use or nonuse

by the youths. Findings also indicated that biological relatedness or the ethnicity of the parent did not add any additional influence beyond whether or not the adult used a seatbelt. However, there was an interesting finding in that this is the only behavior measured where the correlations were significantly higher with male youth than female youth, indicating that parents' seatbelt use is an area to intervene with male adolescent's risk-taking behaviors such as not wearing a seatbelt or, perhaps, a helmet. The lack of influence on the female youth was unexpected and certainly warrants future research. It is possible that this finding could be accounted for by female youth wearing their seatbelts regardless of the behaviors of those around them, whereas the male youth only use their seatbelts if their parents are using theirs. In support of this, further inspection of the data reveals that female adolescents did report using their seatbelts "always" or "most of the time" 13% more than the male adolescents did (i.e., females' reported use was 77.9% and males' reported use was 64.7% for "always" or "most of the time"). Finally, this may be one circumstance where something else is influencing the American Indian female adolescents (e.g., peers) more than their parents' behaviors.

Additionally, there was no correlation found between seatbelt use and the age of the adolescent. This may indicate that modeling behavior is more important than the age of the youth. Also, it may imply that seatbelt use starts before adolescence and the youth has either been trained to use a seatbelt or not by the time he or she enters adolescence.

Findings of the Current Study Regarding SLT and Religiosity

In general, previous studies that have focused on religiosity have found
that religiosity is inversely related with the onset of alcohol consumption (e.g.,
Jessor & Jessor, 1975; Webb et al., 1991), suicide attempts (e.g., Kandel et al.,
1991), and delinquency (e.g., Cochron et al., 1994). Further, some studies have
indicated that certain aspects of religiosity are correlated with health-related
behaviors more than others (e.g., Foshee & Hollinger, 1996; Lorch & Hughes,
1985). The current study provided additional support for these findings and
added to the concept that some aspects of religiosity are more influential than
others.

When the youths' religiosity scales were compared to health-
compromising behaviors, female adolescents showed significant negative
correlations in the areas of: if they had ever smoked a cigarette, if they smoked
currently, if they had ever had an alcoholic drink, and if they had drank alcohol in
the past year. Findings imply that the religiosity scale as defined by importance
of religion, church attendance, and frequency of prayer correlated with not
engaging in certain health-compromising behaviors. Not all of the behaviors
reached statistical significance (i.e., if the female youth has ever smoked, if she
has binged in the last year, and seatbelt use); however, all the correlations
between behavior and religiosity were negative with female youth. This indicates
that church or a religious organization may be an excellent area for intervention

with female American Indian youth, especially if they are already somewhat involved with a religious/spiritual organization.

The same effects were not found with male youth, again indicating that something else is influencing the male youth. The only negative correlation that reached statistical significance with male youths was religiosity and seatbelt use. Again, this is an unexpected result considering that there are no other significant correlations found with the male youth, and that there was no significance found with seatbelt use and religiosity with female youth. The possible reasons for a correlation between seatbelt use of the male adolescents being different than the seatbelt use of the female adolescents were discussed above. However, why religiosity and seatbelt use specifically were significantly correlated with the male adolescent sample is unclear at this time.

Although never reaching statistical significance, trends did appear among the male youths' behaviors when religiosity was broken down into the following: importance of religion, prayer, and church attendance. These trends were not reflected in the results when just the religiosity scale was used. For example, when the three religiosity factors were compared separately with binge drinking, frequency of drinking, and trying a cigarette, the male youth showed mostly positive correlations. On the other hand, the female youth showed all negative correlations in these relationships. The male adolescents also showed all negative correlations between the religiosity factors and seatbelt use, whereas the female youth show mixed results. With just these trends appearing, it is

difficult to determine if certain aspects of religiosity are really more important than others, and suggest that the results found when just the religiosity scale is used are probably more reliable.

To determine how parental modeling of religiosity influenced the adolescents, the parents' religiosity scales were correlated with the adolescents' religiosity scores. All of the correlations were statistically significant and positive (indicating that parents who scored higher on the religiosity scale had children who scored higher on the religiosity scale). However, male youths' religiosity was not statistically significant when correlated with male adults' religiosity. Also, when the correlation found between daughters and fathers was compared to the correlation found between sons and fathers, it was highly significant ($Z = 5.64$, $p < .001$). Again, this is an interesting and unexpected finding. Reasons for this might include different expectations held by fathers towards sons versus daughters, or it could be due to the adolescents spending differential time with fathers versus mothers, or it could suggest that something else other than the parents is influencing the religiosity of the male adolescents (e.g., peers or membership in sacred organizations). Obviously, this finding warrants further study. Another interesting finding related to this is that when male youth are compared to female adults, there is a significant positive correlation. This finding is supported by previous literature that suggests that mothers' behaviors are influential in shaping their adolescents' behaviors (e.g., Meier, 1991).

## Summary of Findings Regarding SLT

Overall, it appears that the smoking behaviors, seatbelt use, and the religiosity of the parents influence the smoking behaviors, seatbelt use, and the religiosity of their American Indian adolescents. However, this is not true of alcohol drinking behaviors, indicating that support for SLT may depend on the behavior being studied with American Indians.

Further, it appears that male and female American Indian adolescents differ with regard to imitating the behaviors modeled by their parents. The female adolescents' behaviors were much more likely to be similar to the behaviors of their parents than the male youth. This is especially true in the areas of smoking and alcohol use. Additionally, there appears to be a special relationship between daughters and fathers in this sample that is not seen between the sons and fathers. The behaviors of the male adults greatly affected the behaviors of the female youth, especially with more severe forms of drinking (i.e., drinking regularly and binge-drinking). The unique influence of the fathers on the daughters was seen with smoking and religiosity as well, whereas the fathers did not influence the sons in these areas.

Additionally, there appears to be weaker correlations between the American Indian male youth and all the adults (especially the male adults) across all the behaviors. The only exception to this is seatbelt use, in which the male youth showed a significant correlation with the female role models. The reasons

for this trend are probably multifactored and may be due, in part, to a differential influence of peers versus parents.

Limitations of Current Study and Directions for Future Research

One of the main limitations of this study is that all the behaviors and demographic information are based on self-report. First, this means the youth and adults did not have to provide any proof of tribal affiliation or blood quantum, so there is no way to determine without doubt that they are, in fact, American Indians. Along with that, there is no way to establish which tribes were included in this study, which greatly reduces its generalizeability to specific American Indian tribes. Further, the American Indians in this study did not supply any information regarding degree of acculturation, so one cannot be sure if these are traditional families, fully assimilated families, or somewhere in between. Again, this reduces the generalizeability to specific American Indians.

Another problem with self-report measures could be that the adolescents or parents may have answered the questions falsely in order to make themselves look better or worse. Hopefully, some of this was controlled because of the interviewing technique. Questions that were deemed sensitive were not asked the respondents directly; instead, the parent or youth listened to a pre-recorded question and answered it on a laptop computer out of view of the interviewer. However, it must be noted that actual behaviors of the youths and adults were not observed or directly measured by the researchers in this study. This leaves

room for the respondents to answer the questions in a false or misleading way, whether intentional or unintentional.

Another problem with this research is the sample used for several correlations was extremely small, particularly when the correlation involved male adults. This was due to the interviewing methods of the Add Health design; they intentionally focused on the mother's reports. This is an obvious and necessary area for future research with American Indian youth–their relationships with male adults.

Additionally, because this study only focused on the ability of parents' and guardians' behaviors to predict the adolescents' behaviors, there is ample opportunity for future study of the behaviors of these adolescents compared to their peers and siblings as well. Further research may provide evidence of stronger relationships than those found with just the parents and introduce better areas for intervention and prevention efforts, or it may help strengthen and clarify some of the findings in this study.

Also, because this study only chose those adolescents who self-identified as American Indian, and because it has been suggested that SLT may apply differently to American Indians versus other ethnic groups, there is a need to compare these adolescents to those of other races and ethnicities. Additionally, repeating this study with specific tribes of American Indians could add to the reliability and generalizability of this research to American Indian populations.

Another area of concern involves the strength of the obtained correlations.

Although statistically significant, many of the correlations were small. For example, many of the significant correlations found between parents' smoking status and the smoking behaviors of the adolescents were significant at the $p < .001$ level, for example, $r(288) = .211$. However, when $R^2$ is obtained for these correlations, one sees that only approximately 5% of the variance is accounted for, indicating that the vast majority of the variance is due to other factors not being studied. In fact, all of the correlations found with smoking behaviors, save one, account for 8% or less of the variance. This same phenomenon is seen for drinking behaviors as well. Thus, these findings may be statistically significant, but not of major importance.

It should be noted, however, that the correlations found between the female youths and the male adults produced larger $R^2$s. For example, when the male adult's smoking status was correlated with if the female youth had ever tried a cigarette, $r(11) = .548$, $p = .05$, the $R^2$ indicated that 30% of the variance was accounted for by this finding. Also, when the father's frequency of drinking and binge-drinking was correlated with the daughter's binge-drinking, $r(11) = .711$, $p = .01$; and $r(11) = .710$, $p = .01$, respectively, over 50% of the variance was accounted for both times.

To summarize, many of the correlations found in this study were .20 or less. Even when statistically significant, these correlations result in a very small amount of the variance being accounted for by the relationship being studied. Therefore, it is recommended that caution be used in interpreting the clinical

meaningfulness of these correlations. Also, it is recommended that this study be replicated with specific American Indian tribes to determine if these findings are practically significant.

Because this was an exploratory study, all of the correlations that reached significance were reported equally. Additionally, this study may help promote further study with American Indian adolescents. Therefore, some relationships that never reached significance were reported as well, because they produced interesting findings that may lead to areas of future research. For example, when the youth's binge drinking was correlated to the adults' drinking status, there was a significant difference between the obtained correlations of the biological and nonbiological parents ($Z = 3.73$, $p < .001$). This may be a helpful finding even though neither group alone produced a significant correlation with the youth's binge drinking.

Finally, the results of this study can and should be used to implement intervention/prevention programs with American Indian youth. The results indicate clear areas to intervene, especially with female youth. Educational programs targeting both adolescents and their parents in the areas of smoking, drinking excessively, and seatbelt use may be useful to lowering the incidence of HCBs. Furthermore, encouraging religious programs that are tribally accepted, or tribally specific, may be a useful way to prevent HCBs from starting, especially with the female American Indian adolescents.

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APPENDICES

Appendix A: Adolescent Instrument

I. Adolescent Questionnaire

A. Youth Demographics

1. <u>What is your birthdate?</u> ____/____/____ So, you are {AGE} years old, then?

2. <u>What sex are you?</u> 1 = Male, 2 = Female

3. <u>What is your race?</u> You may give more than one answer.

1 = American Indian or Native American, 2 = White, 3 = Black or African American, 4 = Asian or Pacific Islander, 5 = or other

4. <u>Which one category best describes your racial background?</u>

1 = American Indian or Native American, 2 = White, 3 = Black or African American, 4 = Asian or Pacific Islander, 5 = or other

B. Cigarette Use

1. <u>Have you ever tried cigarette smoking, even just 1 or 2 puffs?</u> 0 = no, 1 = yes

2. <u>Have you ever smoked cigarettes regularly, that is, at least 1 cigarette every day for 30 days?</u> 0 = no, 1 = yes

3. <u>During the past 30 days, on how many days did you smoke cigarettes?</u> _____days

C. Alcohol Use

1. <u>Have you had a drink of beer, wine, or liquor—not just a sip or a taste of someone else's drink—more than 2 or 3 times in your life?</u> 0 = no, 1 = yes

2. <u>During the past 12 months, on how many days did you drink alcohol?</u> 0 = never, 1 = 1 or 2 days in the past 12 months, 2 = once a month or less (3-12 times in the past 12 months), 3 = 2 or 3 days a month, 4 = 2 or 3 days a week, 5 = 1 or 2 days a week, 6 = 3 to 5 days a week, 7 = every day or almost every day

3. <u>Over the past 12 months, on how many days did you drink five or more drinks in a row?</u> 0 = never, 1 = 1 or 2 days in the past 12 months, 2 = once a month or less (3-12 times in the past 12 months), 3 = 2 or 3 days a month, 4 = 2 or 3 days a week, 5 = 1 or 2 days a week, 6 = 3 to 5 days a week, 7 = every day or almost every day

D. Seat Belt Use

1. <u>How often do you wear a seatbelt when you are riding in or driving a car?</u> 0 = never, 1 = rarely, 2 = sometimes, 3 = most of the time, 4 = always

E. Religiosity

1. <u>What is your religion?</u> 0 = none, 1 = Adventist; 2 = AME, AME Zion, CME; 3 = Assemblies of God; 4 = Baptist; 5 = Christian

Church; 6 = Christian Science; 7 = Congregational; 8 = Episcopal;

9 = Friends/Quaker; 10 = Holiness; 11 = Jehovah's Witness;

12 = Latter Day Saints (Mormon); 13 = Lutheran; 14 = Methodist;

15 = National Baptist; 16 = Pentecostal; 17 = Presbyterian;

18 = United Church of Christ; 19 = other Protestant; 20 = Baha'i;

21 = Buddhist; 22 = Catholic; 23 = Eastern Orthodox; 24 = Hindu;

25 = Islam, Moslem, Muslim; 26 = Jewish—Conservative,

Reformed, Orthodox, or Reconstructionist; 27 = Unitarian; 28 = or

other religion

2. In the past 12 months, how often did you attend religious services?

   0 = never, 1 = less than once a month, 2 = once a month or more,

   but less than once a week, 3 = once a week or more

3. How important is religion to you? 0 = not important at all, 1 = fairly

   unimportant, 2 = fairly important, 3 = very important

4. How often do you pray?  0 = never, 1 = less than once a month, 2 =

   at least once a month, 3 = at least once a week, 4 = at least once a

   day

Appendix B:  Parent Instrument

II.     Parent (or other primary caregiver) Questionnaire

A.  Parent Demographics

1.  <u>Record the respondent's sex</u>.  1 = Male, 2 = Female

2.  <u>What is your race</u>? You may give more than one answer.

1 = American Indian or Native American, 2 = White, 3 = Black or

African American, 4 = Asian or Pacific Islander, 5 = or other

3.  <u>Which ONE category best describes you racial background</u>?

1 = American Indian or Native American, 2 = White, 3 = Black or

African American, 4 = Asian or Pacific Islander, 5 = or other

B.  Cigarette Use

1.  <u>Are there any cigarette smokers in your household</u>? 0 = no, 1 = yes

2.  <u>Do you smoke</u>? 0 = no, 1 = yes

C.  Alcohol Use

1.  <u>How often do you drink alcohol</u>? 0 = never, 1 = once a month or

less, 2 = 2 or 3 days a month, 3 = once or twice a week, 4 = three

to five days a week, 5 = nearly every day

2.  <u>How often in the last month have you had five or more drinks on

one occasion</u>?  0 = never, 1 = once, 2 = twice, 3 = three times, 4 =

four times, 5 = five or more times

D. Seat Belt Use

    1. <u>When you ride or drive in a car, how often do you wear a car seatbelt?</u> 0 = never, 1 = rarely, 2 = sometimes, 3 = most of the time, 4 = always

E. Religiosity

    1. <u>What is your religion?</u> 0 = none, 1 = Adventist; 2 = AME, AME Zion, CME; 3 = Assemblies of God; 4 = Baptist; 5 = Christian Church; 6 = Christian Science; 7 = Congregational; 8 = Episcopal; 9 = Friends/Quaker; 10 = Holiness; 11 = Jehovah's Witness; 12 = Latter Day Saints (Mormon); 13 = Lutheran; 14 = Methodist; 15 = National Baptist; 16 = Pentecostal; 17 = Presbyterian; 18 = United Church of Christ; 19 = other Protestant; 20 = Baha'i; 21 = Buddhist; 22 = Catholic; 23 = Eastern Orthodox; 24 = Hindu; 25 = Islam, Moslem, Muslim; 26 = Jewish—Conservative, Reformed, Orthodox, or Reconstructionist; 27 = Unitarian; 28 = or other religion

    2. <u>How often have you gone to religious services in the past year?</u> 0 = never, 1 = less than once a month, 2 = less than once a week, but at least once a month, 3 = once a week or more

    3. <u>How important is religion to you?</u> 0 = not important at all, 1 = fairly unimportant, 2 = fairly important, 3 = very important

4. <u>How often do you pray?</u>  0 = never, 1 = less than once a month, 2 = at least once a month, 3 = at least once a week, 4 = at least once a day

Appendix C:

Test of Significance of the Difference Between $r_1$ and $r_2$

Edwards (1976) developed the following method for determining if there is a statistical difference between two correlations:

Step 1: Convert the obtained $r$ values into $Z_r$ values.

Step 2: Use the usual formula for the standard error of the difference between two independent variables to obtain the standard error of the difference between the two independent $Z_r$ values:

$$\sigma_{z1\text{-}z2} = \sqrt{\sigma^2_{z1} + \sigma^2_{z2}}$$

$$= \sqrt{\frac{1}{n_1 - 3} + \frac{1}{n_2 - 3}}$$

Step 3: The difference between $z_1$ and $z_2$ divided by the standard error of the difference results in:

$$Z = \frac{z_1 - z_2}{\sigma_{z1\text{-}z2}}$$

The probability of the obtained Z score then provides one the necessary information to determine if the obtained correlations came from populations that can assumed to be different.